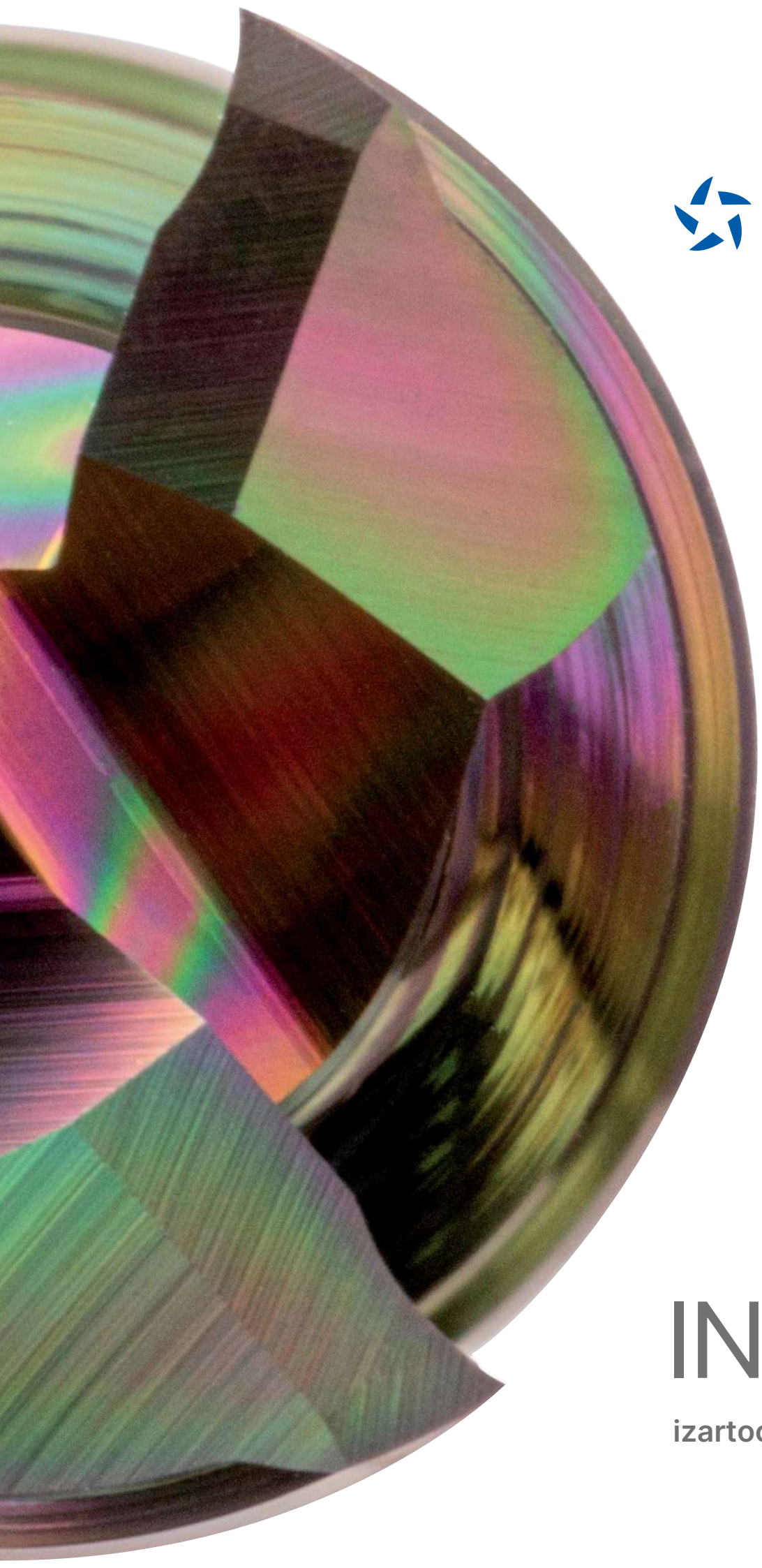

IZAR® CUTTING TOOLS

# IND24

**izartool**.com • 2024

**Amorebieta 01.02.2024**

Estimados clientes, colaboradores y amigos,

Con este catálogo IZAR INDUSTRIAL 2024 les presentamos la más amplia gama de referencias de nuestra historia.

En esta edición incluimos cerca de 18.000 artículos de los cuales queremos destacar varios nuevos productos:

En cuanto a las novedades orientadas al mundo del mecanizado de precisión, resaltamos la renovada gama de machos con refrigeración interior y las fresas de roscar por interpolación 9330-33.

También es relevante el crecimiento de nuestra gama en herramientas de alto avance. Aquí se encuentran las brocas de metal duro integral 9075 de tres dientes, las brocas de cabeza intercambiable 8380-8381 y las plaquitas intercambiables de fresado de alto avance 8691-92-93.

Asimismo, debemos mencionar el novedoso recubrimiento IRIS para las fresas orientadas al mecanizado de materiales no ferrosos como el aluminio y la gama de pinzas de sujeción de alta o ultra-precisión 8390-91-92-95 para herramientas de mango cilíndrico.

Hemos realizado un gran esfuerzo en desarrollar nuevas capacidades y ampliar nuestra propuesta técnica con el ánimo de poner a su disposición la gran evolución de nuestras soluciones de corte, dirigidas a las aplicaciones más específicas de los usuarios finales más exigentes.

Todo el equipo humano de IZAR nos sentimos orgullosos del trabajo realizado y confiamos en seguir dando respuesta a las necesidades de nuestros clientes de una manera sostenible y comprometida con el medio ambiente y con la excelencia en la calidad y en el servicio.

Atentamente,

Dear customers, business partners and friends,

With this IZAR INDUSTRIAL 2024 catalogue, we present you the widest range of references in our history.

In this edition, we include around 18,000 items, among which we would like to highlight several new products:

Regarding innovations oriented towards the precision machining world, we highlight the renewed range of taps with internal cooling and the 9330-33 interpolation threading mills.

The growth of our range in high-feed tools is also significant, such as the 9075 solid carbide drill bits with 3 flutes, 8380-8381 interchangeable head drill bits, and high-feed milling inserts ref. 8691-92-93.

Furthermore, we must mention the innovative IRIS coating for end mills, designed for machining non-ferrous materials such as aluminium. Additionally, the range of high or ultra-precision clamping collets ref. 8390-91-92-95 for cylindrical shank tools is noteworthy.

We have made a significant effort to develop new capabilities and expand our technical offering to provide you with the great evolution of our cutting solutions, tailored to the most specific applications of the most demanding end-users.

The entire IZAR team is proud of the work done and confident in continuing to meet the needs of our customers in a sustainable manner and committed to the environment, and to excellence in quality and service.

Sincerely,

Chers clients, collaborateurs et amis,

Avec ce catalogue IZAR INDUSTRIEL 2024, nous vous présentons la gamme la plus étendue de références de notre histoire.

Dans cette édition, nous avons inclus près de 18 000 articles, parmi lesquels nous souhaitons mettre en avant plusieurs nouveaux produits :

En ce qui concerne les nouveautés orientées vers le monde de l'usinage de précision, nous mettons en avant la gamme renouvelée de tarauds avec refroidissement interne ou les fraises à fileter par interpolation 9330-33.

La croissance de notre gamme d'outils à avance élevée est également importante, avec notamment les forets en carbure monobloc 9075 à trois dents, les forets à tête interchangeable 8380-8381 et les plaquettes de fraisage à avance élevée 8691-92-93.

Nous devons également mentionner le nouveau revêtement IRIS pour les fraises destinées à l'usinage de matériaux non ferreux tels que l'aluminium, ainsi que la gamme de pinces de serrage de haute ou ultra-précision 8390-91-92-95 pour les outils à queue cylindrique.

Nous avons déployé d'importants efforts pour développer de nouvelles capacités et élargir notre offre technique afin de mettre à votre disposition l'évolution majeure de nos solutions de coupe, adaptées aux applications les plus spécifiques des utilisateurs finaux les plus exigeants.

Toute l'équipe d'IZAR est fière du travail accompli, et nous sommes convaincus de continuer à répondre aux besoins de nos clients de manière durable et engagée envers l'environnement, tout en maintenant l'excellence en termes de qualité et de service.

Cordialement,

I am IZAR

**Elena Serrano**
*General Manager*
*IZAR Cutting Tools SAL*
✉ *izar@izartool.com*

## UNA EMPRESA CON VALORES
A Company With Values
Une entreprise avec des valeurs

**Premio PYME del año 2021 en Bizkaia**
SME of the year 2021 in Bizkaia award
Prix PME de l'année 2021 en Biscaye

### Valores IZAR

- La honestidad
- El enfoque al cliente
- La adaptación al cambio
- El compromiso con la calidad y con el trabajo bien hecho
- El trabajo en equipo
- El interés por la tecnología y por la innovación

### IZAR Values

- Honesty
- Customer focus
- Adaptation to change
- Commitment to quality and to the job well done
- Team-work
- Interest for technology and innovation

### Valeurs IZAR

- L'honnêteté
- L'orientation client
- L'adaptation au changement
- L'engagement pour la qualité et pour le travail bien fait
- Le travail en équipe
- L'intérêt pour la technologie et l'innovation

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**A socially responsible company**
Une enterprise socialement responsable

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**Commited to manufacturing and jobs**
Engagés dans la fabrication et l'emploi

### LA CALIDAD TOTAL NOS DISTINGUE

**Total quality makes the difference**
La qualité totale nous diférencie

**ISO** 90101:2015 · **ISO** 14001:2015 · **VPA**

# PRESENCIA INTERNACIONAL

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Présence Internationale

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*Directora de Ventas Iberia*
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**8.00 - 19.00**

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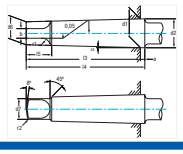
## 14.



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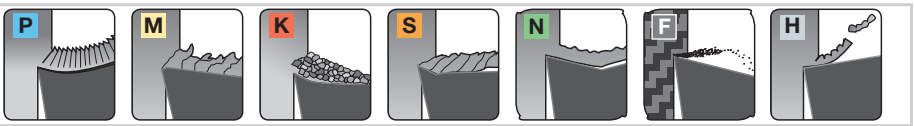
| GRUPO<br>GROUP<br>GROUPE | SUBGRUPO<br>SUBGROUP<br>S. GROUPE | MATERIALES<br>MATERIALS<br>MATÉRIAUX | DUREZA<br>Hardness<br>Dureté<br>(HRC) | DUREZA<br>Hardness<br>Dureté<br>(HB) | TRACCIÓN<br>Tensile<br>Traction<br>(N/mm²) |
|---|---|---|---|---|---|
| P | P.1 | **Aceros Construcción - Aceros Cementación**<br>**Structural Steels - Case Hardening Steels**<br>Aciers de construction - Aciers supérieurs | <24,5 | <250 | <850 |
| | | **Aceros al Carbono No Aleados - Aceros Bonificados**<br>**Unalloyed Carbon Steels - Heat-Treatable Steels**<br>Aciers au carbone sans alliage - Aciers supérieurs | | | |
| | P.2 | **Aceros Aleados**<br>**Alloyed Steels**<br>Aciers alliés | <31,6 | <300 | <1000 |
| | P.3 | **Aceros Aleados Tratados - Aceros Bonificados**<br>**Heat-Treatable Alloyed Steels**<br>Aciers alliés supérieurs | 31,6-42,8 | 300-400 | 1000-1300 |
| | P.4 | **Materiales resistentes al desgaste**<br>**Wear-Resistant Materials**<br>Matériaux résistant a l'usure | 42,8-50,8 | 400-500 | 1300-1800 |
| | P.5 | **INOX Ferríticos-Martensíticos**<br>**Ferritic-Martensitic Stainless**<br>INOX ferritiques-martensitiques | <34 | <320 | <1100 |
| M | | **INOX Austeníticos**<br>**Austenitic Stainless**<br>INOX austénitiques | <24,5 | <250 | <850 |
| K | K.1 | **Fundición Gris**<br>**Grey Cast Iron**<br>Fonte grise | | <200 | <700 |
| | K.2 | **Fundición Nodular**<br>**Nodular Cast Iron**<br>Fonte nodulaire | <31,6 | >200<300 | >700<1000 |
| S | | **Aleaciones Termorresistentes (Titanio, Inconel...)**<br>**Heat-Resistant Alloys (Titanium, Inconel...)**<br>Alliages thermorésistants (Titane, Inconel...) | | | |
| N | N.1 | **Cobre - Bronce - Latón Viruta Corta**<br>**Copper - Bronze - Brass (Short Chip)**<br>Cuivre - Bronze - Laiton (Copeaux courts) | | <200 | <700 |
| | N.2 | **Cobre - Bronce - Latón Viruta Larga**<br>**Copper - Bronze - Brass (Long Chip)**<br>Cuivre - Bronze - Laiton (Copeaux longs) | | <200 | <700 |
| | N.3 | **Al - Mg No Aleado**<br>**Unalloyed Al - Mg**<br>Al - Mg Sans alliage | | <100 | <350 |
| | N.4 | **Aleaciones Al Si < 10%**<br>**Al Alloys Si < 10%**<br>Alliages Al Si < 10% | | <180 | <600 |
| | N.5 | **Aleaciones Al Si > 10%**<br>**Al Alloys Si > 10%**<br>Alliages Al Si > 10% | | <180 | <600 |
| | N.6 | **Termoplásticos**<br>**Thermoplastics**<br>Thermoplastiques | | | |
| | N.7 | **Duroplásticos**<br>**Hard Plastics**<br>Plastiques durs | | | |
| F | | **Composites de Fibras (Fibra de Carbono, Fibra de Vidrio...)**<br>**Fiber Composites (CFRP, GFRP, Honeycomb...)**<br>Composites en fibre (CFRP, GFRP, Structure en nid d'abeilles...) | | | |
| H | | **Aceros Templados, Aceros Endurecidos**<br>**Heat-Treated Alloys**<br>Aciers trempés, Aciers alliés supérieurs | 45<70 | | |

**TIPO DE VIRUTA**
**Chip Type**
Type de copeaux



# TABLA MATERIALES
Material Table - Tableau de matériaux

| | España<br>Spain - Espagne | Alemania<br>Germany - Allemagne | | Francia<br>France | Reino Unido<br>UK - Royaume-Uni | Suecia<br>Sweden - Suède | Italia<br>Italy - Italie | EE.UU.<br>USA - États-Unis |
|---|---|---|---|---|---|---|---|---|
| | UNE | W.-nr. | DIN | AFNOR | B.S. | SS | UNI | AISI |
| | **GRUPO GROUP** GROUPE **P** **ACEROS - STEELS -** ACIERS | | | | | | | |
| P.1 | **ACEROS DE CONSTRUCCIÓN / STRUCTURAL STEELS** / ACIERS DE CONSTRUCTION **(<850 N/mm² / <250 HB)** | | | | | | | |
| | AE235B,FE360 B | 1,0036 | FE360 (ST 37-2) | E -42-2 | FE 360 B | 1311 | FE 360 B FU | A 570 GR.33,36 |
| | AE235B,FE360B | 1,0037 | FE 360 B(RST 37-2) | E 24-2 | FE 360 B | | FE 360 B,C,D | A 283 CR.C |
| | AE275B,FE430BFN | 1,0044 | FE 430 B (ST 44-2) | E 28-2 | FE 430 B FN | | FE 430 B | A 570 GR.40 |
| | A490-2,FE490-2FN | 1,0050 | FE 490-2 (ST 50-2) | A 50-2 | FE 490-2 FN | | FE 490 | A 570 GR.50 |
| | A590-2,FE590-2FN | 1,0060 | FE 590-2 (ST 60-2) | A 60-2 | FE 590-2 FN | | FE 60-2 | A 572 GR.65 |
| | A690-2,FE690-2FN | 1,0070 | FE 690-2 (ST 70-2) | A 70-2 | FE 690-2 FN | | FE 70-2,FE 690 | |
| | AE 235 D,FE360D1FF | 1,0116 | FE 360D1 (ST 37-3) | A 24-3 | FE 360 D1 FF | 1312 | FE 360 C,D | A 284 GR.D |
| | **ACEROS DE CEMENTACIÓN / CASE HARDENING STEELS** / ACIERS DE CIMENTERIE | | | | | | | |
| | F.111 | 1,0401 | C 15 | AF 37 C 12 | 080 A 15 | 1350 | C 15 | M 1015 |
| | F.1510-C10K | 1,1121 | CK 10 | XC 10 | 040 A 10 | 1265 | C 10 | 1010 |
| | F.1110-C15K | 1,1141 | C15 | C18RR | 080M15 | 1390 | C15 | GR.1016 |
| | | 1,7015 | 15 CR 3 | 12C8 | 523M15 | | | 5015 |
| | F.1516-16MNCR5 | 1,7131 | 16MNCR5 | 16MC5 | 527M17 | | 16MNCR5 | NO.5115 |
| | F.150 D | 1,7147 | 20MNCR5 | 20MC5 | | | 20MNCR5 | 5120 |
| | **ACEROS DE FÁCIL MECANIZACIÓN / FREE-CUTTING STEELS** / ACIERS D´USINAGE MECANIQUE FACILE | | | | | | | |
| | F.2111-11SMN28 | 1,0712 | 9SMN28 | S 250 | 230M07 | | CF 9 SMN 28 | 1213 |
| | F.2112-11SMN PB28 | 1,0718 | 9 SMN PB 28 | S 250 PB | | 1914 | CF 9SMN PB28 | 12 L 13 |
| | F.2121-10S20 | 1,0721 | 10S20 | 10F1 | 210M15 | | CF10S20 | GR.1108 |
| | F.210-G | 1,0726 | 35S20 | 35 MF 6 | 212M36 | 1957 | CF 35 SMN 10 | 1140 |
| | | 1,0727 | 45 S 20 | 45 MF 4 | | 1973 | | 1146 |
| | F.2113-12SMN35 | 1,0736 | 9 SMN 36 | S 300 | | | CF 9 SMN 36 | 1215 |
| | F.210-F | 1,0723 | 15 S 20 | | 210 A 15 | 1922 | | |
| | **ACEROS DE CONSTRUCCIÓN FUNDIDOS / CAST STEELS** / ACIERS DE CONSTRUCTION FONTE | | | | | | | |
| | | 1,0416 | GS-83,3 | A 42C-M | AM 1 | | FEG38VR | GR. N1 |
| | | 1,0551 | GS-52 | E26-52-M | 161GR400A | | GC20 | GR.N 2 |
| | | 1,0553 | GS-60 | 30M6M | A 3 | | | GR.80-40 |
| | | 1,0554 | GS-62 | E26-52-M | AW3 | | | GR.105-85 |
| | **ACEROS AL CARBONO NO ALEADOS / UNALLOYED CARBON STEELS** / ACIERS AU CARBONE SANS ALLIAGE | | | | | | | |
| | **ACEROS BONIFICADOS / HEAT-TREATABLE STEELS** / ACIERS SUPÉRIEURS | | | | | | | |
| | F . 112 | 1,0402 | C 22 | 1 C 22 | 070 M 20 | 1450 | C 25 | M 1023 |
| | F. 113 | 1,5010 | C 35 | C 35 | 40 HS | | C 35 | GR.1035 |
| | F.114 | 1,0503 | C 45 | C 45 | 50 HS | 1650 | C 45 | GR.1043 |
| | F.115 | 1,0535 | C 55 | C 54 | 50 | 1655 | C 55 | GR.1055 |
| | | 1,0601 | CK 60 | C 60 | 60 HS,CS | | C 60 | 1060 |
| | F.1120-C25K | 1,1151 | CK 22 | 2 C 22 | 055 M 15 | | C 20, C 25 | 1020 |
| | | 1,1157 | 40 MN 4 | 35 M 5 | 150 M 36 | | | 1035 |
| | F.1130-C35K | 1,1181 | CK 35 | 2 C 35 | 080 A 35 | 1572 | C 35 | 1038 |
| | F.1140-C45K | 1,1191 | CK 45 | 2 C 45 | 080 M 46 | 1660 | C45 | 1045 |
| | F.1150-C55K | 1,1203 | CK 55 | 2 C 55 | 060 A 57 | | C 55 | 1055 |
| | | 1,1221 | CK 60 | 2 C 60 | 060 A 62 | 1770 | C 60 | 1060 |
| | **ACEROS ALEADOS - ALLOYED STEELS -** ACIERS ALLIÉS **(<1000 N/mm² / <300 HB)** | | | | | | | |
| P.2 | **ACEROS ALEADOS PARA HERRAMIENTAS / ALLOYED TOOL STEELS** / ACIERS ALLIÉS POUR OUTILS | | | | | | | |
| | F.5230-100 CR6 | 1,2067 | 100 CR 6 | Y 100 C 6 | BL 3 | | | L 1 , L 3 |
| | F.5212-X210CR12 | 1,2080 | X210 CR 12 | Z 200 C 12 | B D 3 | 2710 | X 205CR12 KU | D 3 |
| | F.5227-X100CRMO V5 | 1,2363 | X 100 CRMO V5 | Z 100 | CDV 5 | 2260 | X100CRMOV51KU | A 2 |
| | | 1,2379 | X 155CRVMO 12 | Z 160CDV12 | BD2 | 2310 | X155CRVMO121KU | D 2 |
| | F.5220-95MNCRW5 | 1,2510 | 100 MNCRW 4 | 90 MWCV 5 | BO 1 | 2140 | 95MNWCR5KU | O 1 |
| | | 1,2550 | 60 WCRV 7 | 55 W C20 | BS 1 | | 55 WCR V8 KU | S 1 |
| | | 1,2842 | 90MN CRV8 | 90 MNV8 | B 02 | | 90MNVCR8KU | O 2 |
| | **ACEROS RÁPIDOS / HIGH SPEED STEELS** / ACIERS RAPIDES | | | | | | | |
| | F.5563.12-1-5-5 | 1,3202 | HS 12-1-4-5 | HS 12-1-5-5 | BT 15 | | HS12-1-5-5 | T 15 |
| | F.5553.10-4-3-10 | 1,3207 | HS 10-4-3-10 | Z130WKCDV | BT 42 | | HS 10-4-3-10 | T 42 |
| | F.5613-6-5-2-5 | 1,3243 | HS 6-5-2-5 | Z85WDKCV06 | BM 35 | 2723 | HS 6-5-2-5 | M 35 |
| | F.5617.-2-10-1-8 | 1,3247 | S 2 10 1 8 | Z110DKCWV | BM 42 | | HS 5-5-2 | M 42 |
| | F.5603.-6-5-2 | 1,3343 | HS 6-5-2 | Z85WDCV06 | BM 2 | 2715 | HS 6-5-2 | M 2 |
| | **FUNDICIÓN ALEADA / ALLOYED CAST IRON** / FONTE ALLIEE | | | | | | | |
| | F.8372-AM26CRMO4 | 1,7218 | GS-25 CRMO 4 | 25 CD 4 | 70 8A 25 | 2225 | 25 CRM04 | 4130 |
| | F.8331-AM34CRMO 4 | 1,7220 | 34 CRM 04 | 25 CD 4 | 708 A25 | 2234 | 30 CRM04 | 4130 |
| | **ACEROS BONIFICADOS / ALLOYED HEAT-TREATABLE STEELS** / ACIERS SUPÉRIEURS | | | | | | | |
| | F. 114 | 1,0503 | C 45 | C 45 | 50 HS | 1650 | C 45 | GR.1043 |
| | F.8331-AM34CRMO 4 | 1,7220 | 34 CRMO 4 | 25 CD4 | 708 A25 | | 30 CRMO 4 | 4130 |
| | F.8332-AM42CRMO 4 | 1,7225 | 41 CRMO 4 | 42 CD4 | 708M 40 | 2244 | 38CRMO 4KB | GR.414O |
| | | 1,7228 | 50 CRMO 4 | 50 CR MO 4 | 708 A 47 | | | 4150 |
| | **ACEROS NITRURACIÓN / NITRIDING STEELS** / ACIERS AVEC NITRATE | | | | | | | |
| | | 1,7779 | 20 CRMOV 1 3 5 | | | | | |
| | | 1,8504 | 34 CR AL 6 | | | | | |
| | F,1741-34CRAIMO 5 | 1,8507 | 34 CRAIMO 5 | 30 CAD 6,12 | | | 34 CR AI MO 7 | A 355 Cl.D |
| | F.1740-41 CRAIMO 7 | 1,8509 | 41 CRAIMO 7 | 40 CAD 6,12 | 905 M 39 | | 41 CR AI MO 7 | A 355 Cl.A |
| | F.1712-31 CRMO 12 | 1,8515 | 31 CRMO 12 | 30 CD 12 | 722 M 24 | 2240 | 30 CR MO 12 | |

# TABLA MATERIALES
Material Table - Tableau de matériaux

| | España<br>Spain - Espagne | Alemania<br>Germany - Allemagne | | Francia<br>France | Reino Unido<br>UK - Royaume-Uni | Suecia<br>Sweden - Suède | Italia<br>Italy - Italie | EE.UU.<br>USA - États-Unis |
|---|---|---|---|---|---|---|---|---|
| | UNE | W.-nr. | DIN | AFNOR | B.S. | SS | UNI | AISI |
| **ACEROS ALEADOS BONIFICADOS - HEAT-TREATABLE ALLOYED STEEL - ACIERS ALLIÉS SUPÉRIEURS (1000-1300 N/mm² / 300-400 HB)** | | | | | | | | |
| **P.3** | **ACEROS ALEADOS HERRAMIENTAS / ALLOYED TOOL STEELS / ACIERS ALLIÉS OUTILS** | | | | | | | |
| | | 1,2311 | 40 CRMNMO 7 | | | | | |
| | | 1,2312 | 40 CRMNMOS 8 6 | | | | | |
| | F.5213-X210CRW 12 | 1,2436 | X 210 CRW 12 | Z 200 CW 12 | | 2312 | X 215 CRW 12 1 KU | |
| | | 1,2713 | 55 NICRMOV 6 | 55 NCDV | BH 224/5 | | | L 6 |
| | | 1,2714 | 56 NICRMOV 7 | 55 NCDV 7 | BH 224/5 | | 56 NICRMOV7KU | L 6 |
| | **ACEROS ALEADOS HTAS. TRABAJO CALIENTE / TOOL STEELS WARM WORKING / ACIERS ALLIÉS OUTILS TRAVAIL EN CHAUD** | | | | | | | |
| | F.5317-X37CRMOV 5 | 1,2343 | X38CRMOV5.1 | Z 38CDV 5 | BH 11 | | X37CRMOV51KU | H 11 |
| | F.5318-X40CRMOV 5 | 1,2344 | X 40CRMOV 51 | X 40CRMOV 5 | BH 13 | 2242 | X 40CRMOV511KU | H 13 |
| | F.5318-X40CRMOV 5 | | | | | | | |
| | F.5313-30CRMOV 12 | 1,2365 | X 32CRMOV 3 3 | 32CDV12-28 | BH 10 | | 30CRMOV1227KU | H 10 |
| | F.5323-X30WCRV 9 3 | 1,2581 | X30WCRV 9,3 | Z30WCV 9 | BH 21 | | X 30WCRV 93KU | H 21 |
| | | 1,2550 | 60 WCRV 7 | 55 WC 20 | BS 1 | | 55 WCRV 8 KU | S 1 |
| | | 1,2567 | X 30 WCRV 5 3 | Z 32 WCV 5 | | | X 30 WCRV 53 KU | |
| | **ACEROS BONIFICADOS / HEAT-TREATABLE STEELS / ACIERS SUPÉRIEURS** | | | | | | | |
| | | 1,5864 | 35 NICR 18 | | | | | |
| | | 1,6580 | 30 NICRMO 8 | | | | | |
| | F-124 A | 1,7361 | 32 CRMO 12 | 30 CD 12 | 722 M 24 | | 32 CRMO 12 | |
| | | 1,7707 | 30 CRMOV 9 | | | | 31 CRMOV 10 | |
| | **ACEROS NITRURACIÓN / NITRIDING STEELS / ACIERS AVEC NITRATE** | | | | | | | |
| | F.1712-31 CRMO 12 | 1,8515 | 31 CRMO 12 | 30 CD 12 | 722 M 24 | 2240 | 30 CRMO 12 | |
| | | 1,8523 | 39 CRMOV 13 9 | | 897 M 39 | | | |
| **P.4** | **Materiales resistentes al desgaste - Wear-Resistant Materials - Matériaux résistant a l'usure**<br>Por ejemplo / For instance / Par exemple **HARDOX® 450 wear plate - XAR 450 - RAEX® - FORA - CREUSABRO** | | | | | | | |
| **P.5** | **ACEROS INOX MARTENSÍTICOS / MARTENSITIC STAINLESS STEEL / ACIERS INOX MARTENSITIQUES (<1100 N/mm² / <320 HB)** | | | | | | | |
| | F.3402-X20CR13 | 1,4021 | X 20 CR 13 | X 20 CR 13 | 420 S 37 | 2314 | X 20 CR 13 | 420 |
| | F.3427-X19CRNI 17-2 | 1,4057 | X 20 CRNI 17 2 | Z 15 CN16,02 | 431 S29 | 2321 | X 16 CRNI16 | 431 |
| | F.3220-X45CRSI09-03 | 1,4718 | X 45 CRSI 9,3 | Z 45 CS9 | 401 S45 | | X 45CR SI 8 | HNV 3 |
| | **ACEROS INOX FERRÍTICOS / FERRITIC STAINLESS STEELS / ACIERS INOX FERRITIQUES (<1100 N/mm² / <320 HB)** | | | | | | | |
| | F.3111-X6CRAI 13 | 1,4002 | X 6 CRAI 13 | Z 8CA 12 | 405 S17 | | X 6 CRAI 13 | 405 |
| | F.3401-X 10 CR 13 | 1,4006 | X 10 CR13 | Z 12 C 13 | 410 S2 | 2302 | X 12 CR 13 | 410 |
| | F.3113-X6 CR17 | 1,4016 | X 6 CR 17 | Z 8 C 17 | 430 S18 | 2320 | X 8 CR 17 | 430 |
| | F.3115-X5CRTI 17 | 1,4510 | X 6 CRTI 17 | Z 8C T 17 | | | X 6 CRTI 17 | 430 TI |
| | | 1,4512 | X 6 CRTI 12 | Z 6CT 12 | 409 S19 | | X 6 CRTI 12 | 409 |
| **GRUPO GROUP GROUPE M ACEROS INOXIDABLES - STAINLESS STEELS - ACIERS INOX** | | | | | | | | |
| | **ACEROS INOX AUSTENÍTICOS / AUSTENITIC STAINLESS STEELS / ACIERS INOX AUSTÉNITIQUES (< 850 N/mm² / <250 HB)** | | | | | | | |
| | F.3507-X 10CRNI 18-8 | 1,4300 | X 12 CRNI 18 8 | | | | | 302 |
| | F.3504-X5CRNI 18-10 | 1,4301 | X5 CRNI 18-10 | X5 CRNI 18-10 | 304 S31 | 2333 | X5 CRNI 18-10 | 304 |
| | F.3541-X2CRNIN 18-10 | 1,4311 | X 2 CRNIN 18-10 | Z 3CN 18.07AZ | 304 S 61 | 2371 | X 2 CRNIN 18 11 | 304 LN |
| | F.3542-X2CRNIMON17-12-2 | 1,4406 | X 2 CRNIMON 17-12-2 | Z 3 CND17.11.02 | 316 S 61 | 2375 | X 2 CRNIMON 17 12 | 316 LN |
| | F.3533-X2CRNIMO17-13-2 | 1,4435 | X2CRNIMO 18-14-3 | Z3CND 17-12-03 | 316 S14 | 2353 | X2CRNIMO 1713 | 316 L |
| | F.3523-X6CRNITI 18-10 | 1,4541 | X 6CRNITI 18-10 | Z 6CNT 18-10 | 321 S31 | 2337 | X 6CRNITI 18 11 | 321 |
| | F.3535-X6CRNITI 17-12-2 | 1,4571 | X 6 CRNIMOTI 17 12 2 | Z 6CNDT 17,12 | 320 S18 | 2350 | X 6 CRNIMOTI 17 12 | 316 TI |
| | F.3535-X6CRNIMOTI17-12 | 1,4573 | X 10 CRNIMOTI 18 12 | | 320 S33 | | X 6 CRNIMOTI 17 13 | 316 TI |
| | F.3312-X15CRNISI20-12 | 1,4828 | X 15CRNISI 20 12 | Z 17CNS 20 12 | 309 S24 | | X 16CRNI 23 14 | 309 |
| **GRUPO GROUP GROUPE K FUNDICIÓN - CAST IRON - FONTE** | | | | | | | | |
| **K.1** | **FUNDICIÓN GRIS / GREY CAST IRON / FONTE GRISE (<700N/mm²/<200 HB)** | | | | | | | |
| | | 0.7033 | GGG 35-3 | FGS 370-71 | GR.350/22 | 0717-15 | GS 370-17 | |
| | | 0.7040 | GGG 40 | FGS 400-12 | GR.420-12 | 0717-02 | GS 400-12 | GR.60-40-18 |
| | | 0.7050 | GGG 50 | FGS 500-7 | 500/7 | 0727 | GS 500-7 | 65-45-12 |
| | | 0.7060 | GGG 60 | FGS 600-3 | GR.600/3 | 0732-03 | GS 600-3 | GR.80-55-06 |
| | | | | | | | | |
| | | 0.8135 | GTS 35-10 | MN 35-10 | B 35-12 | 0815 | B 35-10 | GR.32510 |
| | | 0.8145 | GTS 45-06 | MN 450-6 | P 45-06 | 0852-00 | P 45-06 | GR.45006 |
| | | 0.8155 | GTS 55-04 | MN 550-4 | P 55-04 | 0854-00 | P 55-04 | 6004 |
| **K.2** | **FUNDICIÓN NODULAR / NODULAR CAST IRON / FONTE NODULAIRE (700-1000N/mm² /200-300 HB)** | | | | | | | |
| | | 0.7070 | GGG 70 | FGS 700-2 | GR.700/2 | 0737-01 | GS 700-2 | 100-70-03 |
| | | 0.8080 | GGG 80 | FGS 800-2 | GR.800/2 | | GS 800-2 | GR.120-90-02 |

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# TABLA MATERIALES
Material Table - Tableau de matériaux

| | España<br>Spain - Espagne | Alemania<br>Germany - Allemagne | | Francia<br>France | Reino Unido<br>UK - Royaume-Uni | Suecia<br>Sweden - Suède | Italia<br>Italy - Italie | EE.UU.<br>USA - États-Unis |
|---|---|---|---|---|---|---|---|---|
| | UNE | W.-nr. | DIN | AFNOR | B.S. | SS | UNI | AISI |
| **GRUPO GROUP** GROUPE **S**<br>**ALEACIONES TERMORRESISTENTES - HEAT-RESISTANT ALLOYS** - ALLIAGES THERMORÉSISTANTS | | | | | | | | |
| | **TITANIO PURO / UNALLOYED TITANIUM** / TITANE PUR **(<700 N/mm² / <200 HB)** | | | | | | | |
| | | 3,7024 | TI 99,5 GRADO 1 | T 35 | | | | |
| | | 3,7034 | TI 99,7 GRADO 2 | T 40 | | | | |
| | | 3,7055 | TI 99,4 GRADO 3 | T 50 | | | | |
| | | 3,7065 | TI 4 | T 60 | | | | |
| | **TITANIO ALEADO / ALLOYED TITANIUM** / ALLIAGES TITANE **(< 900 N/mm² / <270 HB)** | | | | | | | |
| | | 3,7114 | TIAL 5 SN 2 | | | | | |
| | | 3,7124 | TICU 2,5 | TU 2 | | | | |
| | | 3,7164 | TIAL 6 V 4 | T-AGV | 2 TA 10 | | | |
| | **ALEACIONES NICKEL / NICKEL ALLOYS** / ALLIAGES NICKEL: **Inconel, Nimonic, Hastelloy... (<1300 N/mm² / <380 HB)** | | | | | | | |
| **GRUPO GROUP** GROUPE **N**<br>**COBRE - LATÓN - BRONCE - COPPER - BRASS - BRONZE** - CUIVRE - LAITON - BRONZE **(< 700 N/mm² / <200-300 HB)** | | | | | | | | |
| **N.1** | **BRONCES / BRONZE** / BRONZES | | | | | | | |
| | | 2,1020 | CU SN 6 | | | | | |
| | C 715O | 2,1030 | CU SN 8 | | | | | |
| | **ALEACIONES COBRE VIRUTA CORTA / SHORT CHIPPING COPPER** / ALLIAGE CUIVRE COPEAUX COURTS | | | | | | | |
| | | 2,0360 | CU ZN 40 | CU ZN 40 | CZ 109 | | P-CU ZN 40 | C 28000 |
| | | 2,0402 | CU ZN 40 PB2 | CU ZN 39 PB2 | CZ 122 | | | C 38000 |
| | **LATONES / BRASS** / LAITONS **(< 700 N/mm² / < 200-300 HB)** | | | | | | | |
| | | 2,0250 | CU ZN 20 | CU ZN 20 | CZ 103 | | | C 24000 |
| | | 2,0265 | CU ZN 30 | CU ZN 30 | CZ 106 | | P-CU ZN 30 | C 26000 |
| | | 2,0321 | CU ZN 37 | CU ZN 37 | CZ 108 | | | C 27400 |
| **N.2** | **ALEACIÓN Cu VIRUTA LARGA / LONG CHIPS ALLOYED Cu** / ALLIAGE Cu COPEAUX LONGS **(< 700 N/mm² / <200-300 HB)** | | | | | | | |
| | | 2,1245 | CUBE 1,7 | CU BE 1,7 | CB101 | | | C 17000 |
| | | 2,1247 | CUBE 2 | CU BE 1,9 | | | | C 17200 |
| **GRUPO GROUP** GROUPE **N**<br>**ALUMINIO - MAGNESIO - ALUMINIUM - MAGNESIUM** | | | | | | | | |
| **N.3** | **Al - Mg SIN ALEAR / UNALLOYED ALUMINIUM - MAGNESIUM / ALUMINIUM** - MAGNESIUM SANS ALLIAGE **(<350 N/mm² / <100 HB)** | | | | | | | |
| | | 3,0250 | Al 99,5 H | | | | | |
| | | 3,0280 | Al 99,8 H | | | | | |
| **N.4** | **ALEACIONES ALUMINIO / ALUMINIUM ALLOYS** / ALLIAGES ALUMINIUM **Si<10% (< 600 N/mm² / <180 HB)** | | | | | | | |
| | L-3811 | 3,0515 | AlMn 1 | 3103 | 3103 | | P-AlMn 1,2 Cu | A 93003 |
| | L-3120-38-312 | 3,1325 | AlCuMg 1 | 2017 A | | | P-AlCu4MgMnSi | A 92017 |
| | L-3140-38-314 | 3,1355 | AlCuMg 2 | 2024 | 2024 | | P-AlCu4-4MgMn | 2024 |
| | L-3710-38.371 | 3,4365 | AlZnMgCu-1,5 | 7075 | 7075 | | P-AlZnMgCu-1,5 | A 9775 |
| | **FUNDICIÓN ALUMINIO / CAST ALUMINIUM** / FONTE ALUMINIUM | | | | | | | |
| | | 3,3292 | GD-AlMg 9 | A-G10SY 4 | LM 10 | | | A 05200 |
| **N.5** | **ALEACIONES ALUMINIO / ALUMINIUM ALLOYS** / ALLIAGES ALUMINIUM **Si>10% (<600 N/mm² / <180 HB)** | | | | | | | |
| | L-256O-61 | 3,2381 | G-AlSi 10 Mg | A-S10G | | | G-AlSi9Mg | A-0359.0 |
| | L-253O | 3,2583 | G-AlSi 11 | A-S12U | LM 20 | | G-AlSi13CuMn | A-04130 |
| **GRUPO GROUP** GROUPE **N**<br>**MATERIALES SINTÉTICOS - SYNTHETIC MATERIALS** - MATERIELS SYNTHETIQUES | | | | | | | | |
| **N.6** | **TERMOPLÁSTICOS / THERMOPLASTICS** / THERMOPLASTIQUES | | | | | | | |
| | | POLIPROPILENO | | | PP | | | |
| | | POLISTIROL | | PS | | | | |
| | | POLIVILNICLORITO | | | PVC | | | |
| | | POLICARBONATO | | MACRALON | PC | | | |
| | ULTRAMID | POLIAMIDA | | PA | | | | |
| | | POLIMETILMETACRILATO | | PLEXIGLAS | PMMA | | | |
| **N.7** | **DUROPLÁSTICOS / HARD PLASTICS** / PLASTIQUES DURS | | | | | | | |
| | BAQUELITA | | | | | | | |
| | PERTINAX | | | | | | | |
| | MOLTOPREN | | | | | | | |
| | RESOPAL | GRAFITO | | | | | | |
| **GRUPO GROUP** GROUPE **F**<br>**COMPOSITES DE FIBRAS (FIBRA DE CARBONO, FIBRA DE VIDRIO, ESTRUCTURAS TIPO PANAL DE ABEJA...)**<br>**FIBER COMPOSITES (CFRP, GFRP, HONEYCOMB...)**<br>COMPOSITES EN FIBRE (CFRP, GFRP, STRUCTURE EN NID D'ABEILLES...) | | | | | | | | |
| **GRUPO GROUP** GROUPE **H**<br>**ACEROS TEMPLADOS, ACEROS ENDURECIDOS**<br>**HEAT-TREATED ALLOYS** - ACIERS TREMPÉS, ACIERS ALLIÉS SUPÉRIEURS | | | | | | | | |

# BROCAS METAL DURO
## Carbide Drill Bits
## Forets carbure

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

Sets pags. 41-62

| Ref. | | Pag. | DIN | Tipo Type | Material | Recubr. Coating Revêt. | P | | | | | M | K | | S | N | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 8400 | | 40 | 6537 K | 3XD | Micro-grano | ALTIN | ● | ● | ● | ○ | ○ | ○ | ● | ● | ○ | ● | ● | ○ | ○ | ○ | | | ○ | ○ |
| 8405 | | 42 | 6537 L | 5XD | Micro-grano | ALTIN | ● | ● | ● | ○ | ○ | ○ | ● | ● | ○ | ● | ● | ○ | ○ | ○ | | | ○ | ○ |
| 8410 | | 44 | 6537 K | 3XD | Grano UF | ALTIN | ● | ● | ● | ○ | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | | | | ○ |
| 8415 | | 46 | 6537 L | 5XD | Grano UF | ALTIN | ● | ● | ● | ○ | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | | | | ○ |
| 8411 | | 48 | IZAR Std. | 8XD | Grano UF | X-AlCr | ● | ● | ● | ○ | ○ | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | | | | ○ |
| 8413 | | 52 | IZAR Std. | 10XD | Grano UF | X-AlCr | ● | ● | ● | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | ○ |
| 8414 | | 53 | IZAR Std. | 15XD | Grano UF | X-AlCr | ● | ● | ● | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | ○ |
| 8416 | | 54 | IZAR Std. | 20XD | Grano UF | X-AlCr | ● | ● | ● | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | | ○ |
| 8401 | | 56 | IZAR Std. | 3XD | Grano UF | TIALCN | ● | ● | ● | | ● | ● | ● | ● | | ○ | ○ | ○ | ○ | ○ | | | ○ | |
| 8402 New! | | 57 | IZAR Std. | 5XD | Grano UF | TIALCN | ● | ● | ● | | ● | ● | ● | ● | | ○ | ○ | ○ | ○ | ○ | | | ○ | |
| 8403 | | 58 | IZAR Std. | 3XD | Grano UF | SUA | | ○ | ○ | ● | ○ | ○ | ○ | ○ | ● | | | | | | | | | ● |
| 9016 | | 60 | IZAR Std. | | Grano UF | | | | | | | | | | | | | | | | | | | ● |
| 9010 | | 63 | 338 | N | Micro-grano | | ● | ● | | | ○ | ○ | ○ | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | |
| 9056 | | 64 | 6539 | N | Micro-grano | | ● | ● | | | ○ | ○ | ○ | ○ | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | |
| 9075 | 3 Z | 66 | IZAR Std. | ... | Grano UF | X-AlCr | ● | ● | ● | ○ | ● | ● | ● | ● | ○ | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| 9301 | | 67 | IZAR Std. | | Micro-grano | | ● | ● | ● | ○ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | | |
| 9303 | | 68 | IZAR Std. | | Micro-grano | | ● | ● | ● | ○ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | | |
| 9310 | | 69 | 333 | A | Micro-grano | | ● | ● | ● | ○ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | | |
| 9100 | | 70 | 338 | N | MD/HM Carbure | | | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | ● | | |
| 9036 | | 71 | 340 | N | MD/HM Carbure | | | ● | ● | | ● | ● | ○ | ○ | ● | ● | ● | | | | | ● | | |

# TABLA USO TALADRADO PMX - HSSE - HSS

PMX - HSSE - HSS Drilling Use Table - Tableau usage Perçage PMX - HSSE - HSS

## BROCAS PMX - HSSE - HSS

PMX - HSSE - HSS Drill Bits

Forets PMX - HSSE - HSS

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée

○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

Sets pags. 74-114-123

| Ref. | | Pag. | DIN | Tipo Type | Material | Recubr. Coating Revêt. | P <850 N/mm² | P < 1000 N/mm² | P 1000-1300 N/mm² | P ANTIDESGASTE Wear-Resistant Anti-Usure | P MARTENSÍTICO Martensitic Martensitique | M INOX AUSTENÍTICO Austenitic Stainless Steel - Aciers inox austénitique | K < 700 N/mm² | K 700-1000 N/mm² | S ALEACIONES TERMORRESISTENTES Heat-Resistant Alloys - Alliages thermorésistants | N VIRUTA CORTA Short Chip - Copeaux courts | N VIRUTA LARGA Long Chip - Copeaux longs | N NO ALEADO Unalloyed - Sans alliage | N < 10% Si | N > 10% Si | N TERMOPLÁSTICOS Thermoplastics - Thermoplastiques | N DUROPLÁSTICOS Hard Plastics - Plastiques durs | F Composites de Fibras Fiber Composites Composites en fibre | H 45-70 HRC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 6016 | | 74 | 338 | N | PMX | X-AlCr | ● | ● | ● | | ● | ● | ● | ● | ● | ○ | ● | | | ● | | ● | | |
| 6000 | | 76 | IZAR Std. | | PMX | NITREX | | | | | | | | | ● | | | ● | ● | ● | | | | |
| 1029 | | 78 | 338 | N | HSSE 5% Co | BORDEAUX | ○ | ○ | ● | ○ | | ● | ● | ● | ○ | | | | | | | | | |
| 1016 | | 80 | 338 | N | HSSE 5% Co | TIALSIN | | ○ | ● | | ● | ○ | ○ | ○ | ● | | | | | | | | | |
| 1000 | | 82 | 338 | TS | HSSE 5% Co | TIALSIN | | ● | ○ | | | | ● | ● | | | | | | ● | ● | | | |
| 1021 | | 83 | 338 | W | HSSE 5% Co | | ● | | | | ● | ● | | | | ● | ● | ● | ● | ● | ○ | ○ | | |
| 1032 New! | | 85 | 338 | W | HSSE 5% Co | | ● | | | | ● | ● | | | | ● | ● | ● | ● | ● | ○ | ○ | | |
| 1020 | | 86 | 338 | W | HSSE 5% Co | | | | | | | ● | | | | | | ● | ● | ● | | | | |
| 1027 | | 87 | 338 | N | HSSE 5% Co | | | ○ | ● | | ● | | | | ● | | | | | | | | | |
| 1015 | | 88 | 338 | N | HSS | ZIRKONIO | ● | | | | | | ● | ● | | | | ● | ● | ● | | | | |
| 1010 | | 90 | 338 | N | HSS | TIN | ● | | | | | | ○ | ○ | | | | ○ | ○ | ○ | | | | |
| 1013 | | 93 | 338 | N | HSS | TIALSIN | ● | | | | | | ○ | ○ | | | | ○ | ○ | ○ | | | | |
| 1012 | | 95 | 338 | H | HSS | | | | | | | | | | | ● | ● | | | | | | | |
| 1007 | | 96 | 338 | N | HSS | | ● | | | | | | ○ | ○ | | | | ○ | ○ | ○ | | | | |
| 1025 L | | 97 | 338 | N | HSS | | ● | | | | | | ○ | ○ | | | | ○ | ○ | ○ | | | | |
| 1054 | | 98 | 1897 | N | Cobalt "S" | X-AlCr | | | | ● | | | | | | | | | | | | | | |
| 1055 | | 99 | 1897 | TS | HSSE 5% Co | TIALSIN | | ● | ○ | | | ○ | ● | ● | ○ | | | | | ● | ● | | | |
| 1056 | | 100 | 1897 | N | HSSE 5% Co | TIALSIN | | | ● | | ● | ● | ○ | ○ | ● | | | | | | | | | |
| 1666 | | 102 | IZAR Std. | | HSSE 5% Co | | | | ● | | ● | | | | ● | | | | | | | | | |
| 1052 New! | | 104 | 1897 | N | HSS | ZIRKONIO | ● | | | | | | ● | ● | | | | ● | ● | ● | | | | |

# BROCAS PMX - HSSE - HSS
## PMX - HSSE - HSS Drill Bits
## Forets PMX - HSSE - HSS

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

Sets pags. 114-123

| Ref. | | Pag. | DIN | Tipo Type | Material | Recubr. Coating Revêt. | P | | | | | M | K | | S | N | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 1050 | | 105 | 1897 | N | HSS | | ● | | | | | | ○ | ○ | | | | ○ | ○ | ○ | | | | |
| 1660 | | 106 | IZAR Std. | | HSS | | ● | | | | | | ○ | ○ | | | | ○ | ○ | ○ | | | | |
| 1036 | | 107 | 340 | N | HSSE 5% Co | | | ○ | ● | | ● | ● | ○ | ○ | ● | | | | | | | | | |
| 1300 | | 108 | 340 | TS | HSSE 5% Co | TIALSIN | | ● | ○ | | | | ● | ● | | | | | | ● | ● | | | |
| 1030 | | 109 | 338 | N | HSS | TIN | ● | | | | | | ○ | ○ | | | | ○ | ○ | ○ | | | | |
| 9040 | | 111 | 1869 | | HSSE 5% Co | | | ● | | | ● | ● | ● | ● | | | | | | ● | ● | | | |
| 1040 | | 112 | 1869 | N | HSS | | ● | | | | | | ● | ● | | | | ○ | ○ | ○ | | | | |
| 9196 | | 126 | 345 | N | MD/HM Carbure | | | ● | ● | | ● | ● | ○ | ○ | ● | ● | ● | | | | | ● | | |
| 9116 | | 127 | 345 | N | HSSE 5% Co | | | ● | | | ● | ● | ● | ● | | | | | | | | | | |
| 1110 | | 128 | 345 | N | HSS | TIN | ● | ○ | | | | | ● | ● | | ○ | ○ | | | | | | | |
| 1154 | | 131 | IZAR Std. | | Cobalt "S" | X-AlCr | | | | ● | | | | | | | | | | | | | | |
| 1130 | | 132 | 341 | N | HSS | | ● | ○ | | | | | ● | ● | | ○ | ○ | | | | | | | |
| 1140 | | 133 | 1870 | N | HSS | | ● | ○ | | | | | ● | ● | | ○ | ○ | | | | | | | |
| 1301 | | 135 | IZAR Std. | | HSSE 5% Co | | ● | ● | ○ | | ● | ● | ● | ● | ● | ● | | | | ● | ● | | | |
| 1303 | | 136 | IZAR Std. | | HSSE 5% Co | | ● | ● | ○ | | ● | ● | ● | ● | ● | ● | | | | ● | ● | | | |
| 1310 | | 137 | 333 | A | HSS | TIN | ● | ● | | | | | ○ | ○ | | ● | | | | ● | | | | |
| 1320 | | 138 | 333 | R | HSS | | ● | ● | | | | | ○ | ○ | | ● | | | | ● | | | | |
| 1330 | | 139 | 333 | B | HSS | | ● | ● | | | | | ○ | ○ | | ● | | | | ● | | | | |
| 9315 | | 140 | 333 | A | HSSE 5% Co | | ● | ● | | | | | ○ | ○ | | ● | | | | ● | | | | |

**FRESAS HUECAS M. ELECTROMAGNÉTICAS** Pag. 153
Annular Cutter Core Drills
Fraises à carotter UP électromagnétiques

**MÁQUINAS AFILADORAS BROCAS** Pag. 171
Drill Bit Sharpening Machines
Machines affûteuse forets

# TABLA USO ESCARIADO
Reaming Use Table - Tableau usage Alésage

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

| Ref. | | Pag. | DIN | Tipo Type | ISO | Material | Recubr. Coating Revêt. | P | | | | | M | K | | S | N | | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | | |
| 9060 | | 176 | 8093 | B | | Micro-grano | ALTIN | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | | ○ |
| 2060 | | 178 | 212 | B/D | 521 | HSSE 5% Co | TIALSIN | ● | ● | ○ | | ● | | | | | | | ○ | ○ | ○ | | | | | |
| 2064 | | 180 | 212 | E | 521 | HSSE 5% Co | | ● | ● | | | | ● | ○ | ○ | ○ | ○ | ○ | | | | | | | | |
| 2160 | | 181 | 208 | B | 521 | HSSE 5% Co | | ● | ● | ○ | | ● | | | | | | | ○ | ○ | ○ | | | | | |
| 2164 | | 182 | 208 | C | 521 | HSSE 5% Co | | ● | ● | | | | ● | ○ | ○ | ○ | ○ | ○ | | | | | | | | |
| 2310 | | 183 | 219 | B | 2402 | HSSE 5% Co | | ● | ● | ○ | | ● | | | | | | | ○ | ○ | ○ | | | | | |
| 2314 | | 184 | 219 | C | 2402 | HSSE 5% Co | | ● | ● | | | | ● | ○ | ○ | ○ | ○ | ○ | | | | | | | | |
| 2316 | | 185 | 217 | | | HSS | | | | | | | | | | | | | | | | | | | | |
| 2020 |  | 185 | 2179 | E | 3466 | HSS | | ● | | | | | | | | | | | | | ● | | | | | |
| 2130 | | 186 | 311 | | 2238 | HSS | | ● | | | | | | | | | | | | | ● | | | | | |
| 2010 | | 187 | 206 | B | 236 | HSS | | ● | | | | | | | | | | | | | ● | | | | | |
| 2026 | | 188 | 9 | B | 3465 | HSS | | ● | | | | | | | | | | | ● | ● | ● | ● | | | | |

# TABLA USO AVELLANADO
## Countersinking-Counterboring Use Table - Tableau usage Fraisage

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

| Ref. | | Pag. | DIN | Tipo Type | ISO | Material | Recubr. Coating Revêt. | P.1 <850 N/mm² | P.2 <1000 N/mm² | P.3 1000-1300 N/mm² | P.4 ANTIDESGASTE Wear-Resistant Anti-Usure | P.5 MARTENSÍTICO Martensitic Martensitique | M INOX AUSTENÍTICO Austenitic Stainless Steel - Aciers inox austénitique | K.1 FUNDICIÓN Cast Iron Fonte <700 N/mm² | K.2 FUNDICIÓN Cast Iron Fonte 700-1000 N/mm² | S ALEACIONES TERMORRESISTENTES Heat-Resistant Alloys - Alliages thermorésistants | N.1 VIRUTA CORTA Short Chip - Copeaux courts Cu - BRONCE LATÓN Copper Bronze Brass Cuivre Bronze Laiton | N.2 VIRUTA LARGA Long Chip - Copeaux longs Cu - BRONCE LATÓN Copper Bronze Brass Cuivre Bronze Laiton | N.3 NO ALEADO Unalloyed - Sans alliage ALUMINIO - MAGNESIO Aluminium - Magnesium | N.4 < 10% Si ALUMINIO - MAGNESIO Aluminium - Magnesium | N.5 > 10% Si ALUMINIO - MAGNESIO Aluminium - Magnesium | N.6 TERMOPLÁSTICOS Thermoplastics - Thermoplastiques | N.7 DUROPLÁSTICOS Hard Plastics - Plastiques durs | F Composites de Fibras Fiber Composites Composites en fibre | H 45-70 HRC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9575 | | 190 | 335 | C | | Micro-grano | | ● | ● | ● | ○ | ● | ● | ● | ● | ○ | ● | ○ | ● | ● | ● | ○ | | | ○ |
| 6575 | | 191 | 335 | C | | PMX | | | | ● | ● | ● | ● | | | | | | | | | ● | | | |
| 2571 New! | | 192 | 335 | C | | HSSE 5% Co | TIALN | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | |
| 2574 | | 193 | 335 | C | | HSSE 5% Co | ZIRKONIO | ● | | | | ○ | ○ | | | | ● | | ● | ● | ● | ● | | | |
| 2575 | | 194 | 335 | C | | HSSE 5% Co | | ● | | | | ○ | ○ | | | | ● | | ● | ● | ● | ● | | | |
| 2572 | | 195 | IZAR Std. | | | HSSE 5% Co | | ● | | | | | ○ | | | | | | ● | ● | ● | | | | |
| 2573 | | 196 | 335 | C | | HSS | | ● | | | | ○ | ○ | | | | ● | | ● | ● | ● | ● | | | |
| 2550 | | 197 | 334 | A | 3294 | HSS | | ● | ○ | | | | | | | ● | | | | | | | | | |
| 2580 | | 197 | 347 | A | 3294 | HSS | | ● | ○ | | | | | | | ● | | | | | | | | | |
| 2530 | | 198 | 373 | | 4206 | HSS | | ● | ○ | | | ● | | ● | | ○ | ○ | ○ | | | ● | | | | |
| 2685 | | 199 | 335 | D | | HSS | | ● | | | | ○ | ○ | | | | ● | | ● | ● | ● | ● | | | |
| 2660 | | 200 | 334 | B | 3293 | HSS | | ● | ○ | | | | | | | ● | | | | | | | | | |
| 2690 | | 200 | 347 | B | 3293 | HSS | | ● | ○ | | | | | | | ● | | | | | | | | | |
| 2630 | | 201 | 375 | | | HSS | | ● | ○ | | | ● | | ● | | ○ | ○ | ○ | | | ● | | | | |

## TABLA USO ROSCADO
Threading Use Table - Tableau usage Taraudage

# MACHOS
## Taps / Tarauds *

***Punta** / **Point** / Pointe **M3-M6: Macho** / **Male**
***Punta** / **Point** / Pointe **>M6: Hembra** / Female

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

Sets pags. 252-257

| Ref. | | Pag. | Rosca Thread Filet | Uso Use Usage | DIN | Material | Recubr. Coating Revêt. | P | | | | | M | K | | S | N | | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 3129 | Form: B 3,5-6h Tol: 6HX | 209 | M | Máquina Machine | 371 / 376 | PMX | HARD | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | | | | |
| 3169 | Form: C 2-3h Tol: 6H | 209 | M | Máquina Machine | 371 / 376 | PMX | HARD | ● | ● | ● | ○ | ● | ● | | | ○ | ○ | ○ | ○ | ○ | ○ | | | | |
| 3130 / 3230 | Form: B 3,5-5h Tol: 6H | 210 | M | Máquina Machine | 371 / 376 | PMX | HARD | | | ● | ● | | | | | ● | | | | | ○ | | ● | | ○ |
| 3170 / 3270 | Form: C 2-3h Tol: 6H | 211 | M | Máquina Machine | 371 / 376 | PMX | HARD | | | ● | ● | | | | | ● | | | | | ○ | | ● | | ○ |
| 3125 / 3225 | Form: B 3,5-5h Tol: 6H | 212 | M | Máquina Machine | 371 / 376 | PMX | HARD | | ● | | | ● | ● | ● | ● | | ● | ● | | | | | | | |
| 3165 / 3265 | Form: C 2-3h Tol: 6H | 213 | M | Máquina Machine | 371 / 376 | PMX | HARD | | ● | | | ● | ● | ● | ● | | ● | ● | | | | | | | |
| 3149 / 3249 | Form: B 3,5-5h Tol: 6H | 214 | M | Máquina Machine | 371 / 376 | HSSE 5% Co | TIN | | | | | ● | ● | | | | ● | ● | | | | | | | |
| 3159 / 3259 | Form: C 2-3h Tol: 6H | 215 | M | Máquina Machine | 371 / 376 | HSSE 5% Co | TIN | | | | | ● | ● | | | | ● | ● | | | | | | | |
| 3143 | Form: B 3,5-5h Tol: 6H | 216 | M | Máquina Machine | 371 | HSSE-V | | ○ | ● | | | ○ | ○ | ● | ● | | | | | | ● | | | | |
| 3243 | Form: B 3,5-5h Tol: 6H | 216 | M | Máquina Machine | 376 | HSSE-V | | ○ | ● | | | ○ | ○ | ● | ● | | | | | | ● | | | | |
| 3153 | Form: C 2-3h Tol: 6H | 217 | M | Máquina Machine | 371 | HSSE-V | | ○ | ● | | | ○ | ○ | ● | ● | | | | | | ● | | | | |
| 3253 | Form: C 2-3h Tol: 6H | 217 | M | Máquina Machine | 376 | HSSE-V | | ○ | ● | | | ○ | ○ | ● | ● | | | | | | ● | | | | |
| 3176 / 3276 | Form: C 2-3h Tol: 6HX | 218 | M | Máquina Machine | 371 / 376 | HSSE 5% Co | | | | | | | | ● | ● | | | | | | | | | | |
| 3172 / 3272 | Form: B 3,5-5h Tol: 6H | 219 | M | Máquina Machine | 371 / 376 | HSSE 5% Co | | | | | | | | | | | | | ● | | | | | | |

## TABLA USO ROSCADO
Threading Use Table - Tableau usage Taraudage

| Ref. | | Pag. | Rosca Thread Filet | Uso Use Usage | DIN | Material | Recubr. Coating Revêt. | P | | | | | M | K | | S | N | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 3175<br>3275 | Form: C 2-3h Tol: 6H | 220 | M | Máquina Machine | 371<br>376 | HSSE 5% Co | | | | | | | | | | | | | ● | | | | | | |
| 3174<br>3274 | Form: B 3,5-5h Tol: 6H | 221 | M | Máquina Machine | 371<br>376 | HSSE 5% Co | | ● | ○ | | | ○ | ○ | | | | ○ | ○ | ● | ● | ● | ○ | | | |
| 3140<br>3240 | Form: C 2-3h Tol: 6H | 222 | M | Máquina Machine | 371<br>376 | HSSE 5% Co | | | | | | | | | | | ● | | | | | | | | |
| 3120<br>3220 | Form: B 3,5-5h Tol: 6H | 223 | M | Máquina Machine | 371<br>376 | HSSE-V | TIN | ● | ● | | | ● | ● | ● | ● | | ● | ● | | ● | ● | ● | | | |
| 3160<br>3260 | Form: C 2-3h Tol: 6H | 224 | M | Máquina Machine | 371<br>376 | HSSE-V | TIN | ● | ● | | | ● | ● | ● | ● | | ● | ● | | ● | ● | ● | | | |
| 3151<br>3251 | Form: C 2-3h Tol: 6H | 225 | M | Máquina Machine | 371<br>376 | HSSE 5% Co | | ● | | | | | | | | | | | ● | | | | | | |
| 3164 | Form: C 2-3h Tol: 6HX | 227 | M | Máquina Machine | 2174 | PMX | TICN | ● | ● | ● | ● | ● | ● | | | | ● | ● | ● | ● | ● | | | | |
| 3171 | Form: C 2-3h Tol: 6HX | 228 | M | Máquina Machine | 371 / 376 | PMX | TIALN-TIN | ● | ● | ● | | ● | ● | | | | ● | ● | ● | ● | ● | | | | |
| 3162 | Form: C 2-3h Tol: 6HX | 229 | M | Máquina Machine | 2174 | PMX | TIN | ● | ● | ● | | ● | ● | | | | ● | ● | ● | ● | ● | | | | |
| 3173 | Form: E 1,5-2h Tol: 6HX | 230 | M | Máquina Machine | 371 | PMX | TICN | ● | ● | ● | | ● | ● | | | | ● | ● | ● | ● | ● | | | | |
| 3163 | Form: C 2-3h Tol: 6HX | 230 | M | Máquina Machine | 2174 | HSSE 5% Co | TICN | ● | | | | | | | | | ● | ● | ● | ● | | | | | |
| 3100<br>3200 | Form: B 3,5-5h Tol: 6H | 231<br>232 | M/MF | Máquina Machine | 371<br>376 / 374 | HSSE 5% Co | | ● | | | | | | ● | | | ○ | | ● | ● | | | | | |
| 3110<br>3210 | Form: C 2-3h Tol: 6H | 234<br>235 | M/MF | Máquina Machine | 371<br>376 / 374 | HSSE 5% Co | | ● | | | | | | ● | | | ● | | | | ● | | | | |
| 3600 | Form: A 6-8h Tol: 6H | 237 | M | Máquina Machine | 371 | HSSE 5% Co | | ● | | | | | | | | | | | | | | | | | |
| 3150<br>3250 | Form: C 2-3h Tol: 6H | 238<br>239 | M/MF | Máquina Machine | 371<br>376 | HSSE 5% Co | | ● | | | | | | ● | | | ○ | | ● | ● | | | | | |
| 3166 | Form: B 3,5-5h Tol: 6H | 240 | M/MF | Máquina Machine | 371 | HSSE 5% Co | | ● | | | | | | | | | ○ | | ● | ● | | | | | |
| 3167 | Form: C 2-3h Tol: 6H | 241 | M/MF | Máquina Machine | 371 | HSSE 5% Co | | ● | | | | | | | | | ○ | | ● | ● | | | | | |
| 3101 L<br>3201 L | Form: B 3,5-5h Tol: 6H | 242 | M | Máquina Machine | 371<br>376 / 374 | HSSE 5% Co | | ● | | | | | | ● | | | ○ | | ● | ● | | | | | |

## TABLA USO ROSCADO
Threading Use Table - Tableau usage Taraudage

# MACHOS
## Taps / Tarauds *

***Punta** / **Point** / Pointe **M3-M6: Macho** / **Male**
***Punta** / **Point** / Pointe **>M6: Hembra** / Female

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

Sets pags. 252-257

| Ref. | | Pag. | Rosca Thread Filet | Uso Use Usage | DIN | Material | Recubr. Coating Revêt. | P.1 <850 N/mm² | P.2 <1000 N/mm² | P.3 1000-1300 N/mm² | P.4 ANTIDESGASTE Wear-Resistant Anti-Usure | P.5 MARTENSÍTICO Martensitic Martensitique | M INOX AUSTENÍTICO Austenitic Stainless Steel - Aciers inox austénitique | K.1 < 700 N/mm² FUNDICIÓN Cast Iron Fonte | K.2 700-1000 N/mm² | S ALEACIONES TERMORRESISTENTES Heat-Resistant Alloys - Alliages thermorésistants | N.1 VIRUTA CORTA Short Chip - Copeaux courts | N.2 VIRUTA LARGA Long Chip - Copeaux longs | N.3 NO ALEADO Unalloyed - Sans alliage | N.4 < 10% Si | N.5 > 10% Si | N.6 TERMOPLÁSTICOS Thermoplastics - Thermoplastiques | N.7 DUROPLÁSTICOS Hard Plastics - Plastiques durs | F Composites de Fibras Fiber Composites Composites en fibre | H 45-70 HRC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | P | | | | | M | K | | S | N | | | | | | | | F | H |
| | | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 3161 L / 3261 L | Form: C 2-3h Tol: 6H | 243 | M | Máquina Machine | 371 / 376 / 374 | HSSE 5% Co | | ● | | | | | | ● | | | ○ | | ● | ● | | | | | |
| 3105 / 3205 | Form: B 3,5-5h Tol: 6G | 244 | M | Máquina Machine | 371 / 376 | HSSE 5% Co | | ● | | | | | | ● | | | ○ | | ● | ● | | | | | |
| 3155 / 3255 | Form: C 2-3h Tol: 6G | 245 | M | Máquina Machine | 371 / 376 | HSSE 5% Co | | ● | | | | | | ● | | | ○ | | ● | ● | | | | | |
| 3119 | Form: B 3,5-5h Tol: 6H | 246 | M | Máquina Machine | ISO 529 | HSSE 5% Co | | ● | ○ | | | | ● | ● | | | ○ | | ● | ● | | | | | |
| 3113 New! | Form: C 1-2h Tol: 6H | 247 | M | Máquina Machine | ISO 529 | HSSE 5% Co | | ● | ○ | | | | ● | ● | | | ○ | | ● | ● | | | | | |
| 3109 | Form: B 3,5-5h Tol: 6H | 248 | M (ISO) | Máquina Machine | ISO 529 | HSS | TIN | ● | | | | | | ● | | | ○ | | ● | ● | | | | | |
| 3157 | Form: C 2-3h Tol: 6H | 249 | M (ISO) | Máquina Machine | ISO 529 | HSS | TIN | ● | | | | | | ● | | | ○ | | ● | ● | | | | | |
| 3185 | Form: 18h Tol: 6H | 250 | M | Máquina Machine | 357 | HSS | | ● | | | | | | | | | ● | ● | ● | | | | | | |
| 3036 | Form: C 2-3h Tol: 6H | 260 | M | Mano Hand Main | 352 / 2181 | HSSE 5% Co | | | | | | ● | ● | ○ | ○ | | | | | | | | | | |
| 3030 / 3031 L | Form: C 2-3h Tol: 6H | 261 | M | Mano Hand Main | 352 / 352 | HSS | | ● | | | | | | ● | ● | | ● | | ● | ● | ○ | | | | |
| 3040 | Form: C 2-3h / B 3,5-5h / A 6-8h Tol: 6H | 262 | M | Mano Hand Main | ISO 529 | HSS | | ● | | | | | | ● | ● | | ○ | ○ | ● | ● | ● | | | | |

# MACHOS
## Taps / Tarauds *

***Punta** / **Point** / Pointe **M3-M6: Macho** / **Male**
***Punta** / **Point** / Pointe **>M6: Hembra** / Female

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

Sets pags. 252-257

| Ref. | | Pag. | Rosca Thread Filet | Uso Use Usage | DIN | Material | Recubr. Coating Revêt. | P.1 <850 N/mm² | P.2 <1000 N/mm² | P.3 1000-1300 N/mm² | P.4 ANTIDESGASTE Wear-Resistant Anti-Usure | P.5 MARTENSÍTICO Martensitic Martensitique | M INOX AUSTENÍTICO Austenitic Stainless Steel - Aciers inox austénitique | K.1 < 700 N/mm² | K.2 700-1000 N/mm² | S ALEACIONES TERMORRESISTENTES Heat-Resistant Alloys - Alliages thermorésistants | N.1 VIRUTA CORTA Short Chip - Copeaux courts | N.2 VIRUTA LARGA Long Chip - Copeaux longs | N.3 NO ALEADO Unalloyed - Sans alliage | N.4 < 10% Si | N.5 > 10% Si | N.6 TERMOPLÁSTICOS Thermoplastics - Thermoplastiques | N.7 DUROPLÁSTICOS Hard Plastics - Plastiques durs | F Composites de Fibras Fiber Composites Composites en fibre | H 45-70 HRC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | P | | | | | M | K | | S | N | | | | | | | F | H |
| | | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 3020<br>3021 ↰L | <br>**Form:** C 2-3h **Tol:** 6H | 263<br>264 | MF | Mano Hand Main | 2181<br>2181 | HSS | | ● | | | | | | ● | ● | | ● | | ● | ● | ○ | | | | |
| 3037 | <br>**Form:** C 2-3h **Tol:** 6H | 265 | M | Mano Hand Main | 352 / 2181 | HSSE 5% Co | | | | | | ● | ● | ○ | ○ | | | | | | | | | | | |
| 3010 | <br>**Form:** C 2-3h **Tol:** 6H | 266 | M/MF | Mano Hand Main | 352 / 2181 | HSS | | ● | | | | | | ● | ● | | ● | | ● | ● | ○ | | | | |
| 3023 | <br>**Form:** 4-6h **Tol:** 6H | 269 | M | Mano Hand Main | 352 | HSS | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ● | | | | |
| 3039 New! | <br>**Form:** A 6-8h / B 3,5-5h / C 2-3h - **Tol:** 6H | 270 | M/MF | Máquina Machine | ISO 529 | HSS | | ● | ○ | | | | | ● | | | ○ | | ● | ● | | | | | |
| 3144 | <br>**Form:** C 2-3h **Tol:** 2B | 273 | UNC | Máquina Machine | 371 | PMX | HARD | | ● | | | ● | ● | ○ | ○ | | ● | ● | ● | ● | ○ | | | | |
| 3104 | <br>**Form:** C 2-3h **Tol:** 2B | 273 | UNC | Máquina Machine | 371 | PMX | HARD | | ● | | | ● | ● | ○ | ○ | | ● | ● | ● | ● | ○ | | | | |
| 3134<br>3234 | <br>**Form:** B 3,5-5h **Tol:** 2B | 274 | UNC | Máquina Machine | 371<br>376 | HSSE 5% Co | | ● | | | | | | ● | | | ● | ● | ● | ● | ○ | | | | |
| 3114<br>3214 | <br>**Form:** C 2-3h **Tol:** 2B | 275 | UNC | Máquina Machine | 371<br>376 | HSSE 5% Co | | ● | | | | | | ● | | | ● | ● | ● | ● | ○ | | | | |
| 3154<br>3254 | <br>**Form:** C 2-3h **Tol:** 2B | 276 | UNC | Máquina Machine | 371<br>376 | HSSE 5% Co | | ● | | | | | | ● | | | ● | ● | ● | ● | ○ | | | | |
| 3103 New! | <br>**Form:** B 3,5-5h / C 2-3h - **Tol:** 6H | 277 | M | Máquina Machine | ISO 529 | HSS | | ● | | | | | | ● | | | ○ | | ● | ● | | | | | |
| 3034 | <br>**Form:** C 2-3h **Tol:** 2B | 278 | UNC | Mano Hand Main | 352 | HSS | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |

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# MACHOS
## Taps / Tarauds *

***Punta** / **Point** / Pointe **M3-M6: Macho** / **Male**
***Punta** / **Point** / Pointe **>M6: Hembra** / Female

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

Sets pags. 252-257

| Ref. | | Pag. | Rosca Thread Filet | Uso Use Usage | DIN | Material | Recubr. Coating Revêt. | P | | | | | M | K | | S | N | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 3127 | Form: B 3,5-5h Tol: 2B | 279 | UNF | Máquina Machine | 374 | PMX | HARD | | ● | | ● | ● | | ○ | ○ | | ● | ● | ● | ● | ○ | | | | |
| 3124 | Form: C 2-3h Tol: 2B | 279 | UNF | Máquina Machine | 374 | PMX | HARD | | ● | | ● | ● | | ○ | ○ | | ● | ● | ● | ● | ○ | | | | |
| 3204 | Form: B 3,5-5h Tol: 2B | 280 | UNF | Máquina Machine | 374 | HSSE 5% Co | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3224 | Form: C 2-3h Tol: 2B | 280 | UNF | Máquina Machine | 374 | HSSE 5% Co | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3244 | Form: C 2-3h Tol: 2B | 281 | UNF | Máquina Machine | 374 | HSSE 5% Co | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3141 New! | Form: C 2-3h Tol: 2BX | 282 | UNC/ UNF | Máquina Machine | 371 / 376 | HSSE 5% Co | TIALN-TIN | ● | ● | ● | | ● | ● | | | | ● | ● | ● | ● | ● | | | | |
| 3123 New! | Form: B 3,5-5h / C 2-3h - Tol: 6H | 283 | UNF | Máquina Machine | ISO 529 | HSS | | ● | | | | | | | | | ● | | ● | ● | | | | | |
| 3024 | Form: C 2-3h Tol: 2B | 284 | UNF | Mano Hand Main | 2181 | HSS | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3025 | Form: C 2-3h Tol: 2B | 285 | UNEF | Mano Hand Main | 2181 | HSS | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3209 | Form: C 2-3h Tol: 2B | 286 | UN | Máquina Machine | 374 | HSSE 5% Co | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3107 | Form: C 2-3h | 287 | NPT | Máquina Machine | 374 | HSSE 5% Co | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3017 | Form: 1,5-2h | 287 | NPT | Mano Hand Main | 2181 | HSS | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |

# MACHOS
## Taps / Tarauds *

***Punta** / **Point** / Pointe **M3-M6: Macho** / **Male**
***Punta** / **Point** / Pointe **>M6: Hembra** / Female

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

| Ref. | | Pag. | Rosca Thread Filet | Uso Use Usage | DIN | Material | Recubr. Coating Revêt. | P: <850 N/mm² | P: <1000 N/mm² | P: 1000-1300 N/mm² | P: ANTIDESGASTE Wear-Resistant Anti-Usure | P: MARTENSÍTICO Martensitic Martensitique | M: INOX AUSTENÍTICO Austenitic Stainless Steel - Aciers inox austénitique | K: <700 N/mm² | K: 700-1000 N/mm² | S: ALEACIONES TERMORRESISTENTES Heat-Resistant Alloys - Alliages thermorésistants | N: VIRUTA CORTA Short Chip - Copeaux courts | N: VIRUTA LARGA Long Chip - Copeaux longs | N: NO ALEADO Unalloyed - Sans alliage | N: < 10% Si | N: > 10% Si | N: TERMOPLÁSTICOS Thermoplastics - Thermoplastiques | N: DUROPLÁSTICOS Hard Plastics - Plastiques durs | F: Composites de Fibras Fiber Composites Composites en fibre | H: 45-70 HRC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | P | | | | | M | K | | S | N | | | | | | | F | H |
| | | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 3102<br>3202 | **Form:** B 3,5-5h | 288 | BSW (Whitworth) | Máquina Machine | 371<br>376 | HSSE 5% Co | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3112<br>3212 | **Form:** C 2-3h | 289 | BSW (Whitworth) | Máquina Machine | 371<br>376 | HSSE 5% Co | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3152<br>3252 | **Form:** C 2-3h | 290 | BSW (Whitworth) | Máquina Machine | 371<br>376 | HSSE 5% Co | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3032<br>3012 | **Form:** C 2-3h **Tol:** 6H | 291<br>292 | BSW (Whitworth) | Mano Hand Main | 352 | HSS | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3126 | **Form:** B 3,5-5h **Tol:** 6H | 293 | BSPP (Gas) | Máquina Machine | 5156 | HSSE 5% Co | TIN | | | | | ● | ● | | | | | | | | | | | | |
| 3136 | **Form:** C 2-3h **Tol:** 6H | 293 | BSPP (Gas) | Máquina Machine | 5156 | HSSE 5% Co | TIN | | | | | ● | ● | | | | | | | | | | | | |
| 3106 | **Form:** B 3,5-5h | 294 | BSPP (Gas) | Máquina Machine | 5156 | HSSE 5% Co | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3116 | **Form:** C 2-3h | 294 | BSPP (Gas) | Máquina Machine | 5156 | HSSE 5% Co | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3156 | **Form:** C 2-3h **Tol:** 6H | 295 | BSPP (Gas) | Máquina Machine | 5156 | HSSE 5% Co | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3026 | **Form:** C 2-3h | 296 | BSPP (Gas) | Mano Hand-Main | 5157 | HSS | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3016 | **Form:** C 2-3h | 297 | BSPP (Gas) | Mano Hand-Main | 5157 | HSS | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3019 | **Form:** C 2-3h | 298 | BSPT (RC) | Mano Hand-Main | 5157 | HSS | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |
| 3011 | **Form:** C 2-3h **Tol:** 6H | 298 | PG | Mano Hand-Main | 40432 | HSS | | ● | | | | | | ● | ● | | ● | ● | ● | ● | ○ | | | | |

# TABLA USO ROSCADO
## Threading Use Table - Tableau usage Taraudage

Sets pags. 252-257

| Ref. | | Pag. | Rosca Thread Filet | Uso Use Usage | DIN | Material | Recubr. Coating Revêt. | P | | | | | M | K | | | S | N | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 3540 | | 299 | M | Máquina Machine | 223 | HSS | | ● | ○ | | | | ○ | | | | | ● | ● | ● | | | ● | | | |
| 3536 | | 300 | M/MF | Mano Hand Main | 22568 | HSSE 5% Co | | ● | ○ | | | ● | ● | | | | | ● | ● | ● | | | ● | | | |
| 3500 | | 301 | M/MF | Mano Hand Main | 223 | HSS | | ● | ○ | | | | ○ | | | | | ● | ● | ● | | | ● | | | |
| 3501 L | | 302 | M | Mano Hand Main | 223 | HSS | | ● | ○ | | | | ○ | | | | | ● | ● | ● | | | ● | | | |
| 3510 | | 303 | M | Mano Hand Main | ISO 529 | HSS | | ● | ○ | | | | ○ | | | | | ● | ● | ● | | | ● | | | |
| 3560 New! | | 305 | M/MF | Mano Hand Main | 382 | HSS | | ● | ○ | | | | ○ | | | | | ● | ● | ● | | | ● | | | |
| 3534 | | 306 | UNC | Mano Hand Main | 223 | HSS | | ● | ○ | | | | ○ | | | | | ● | ● | ● | | | ● | | | |
| 3504 | | 306 | UNF | Mano Hand Main | 223 | HSS | | ● | ○ | | | | ○ | | | | | ● | ● | ● | | | ● | | | |
| 3505 | | 307 | UNEF | Mano Hand Main | 22568 | HSS | | ● | ○ | | | | ○ | | | | | ● | ● | ● | | | ● | | | |
| 3507 | | 307 | NPT | Mano Hand Main | 223 B | HSS | | ● | ○ | | | | ○ | | | | | ● | ● | ● | | | ● | | | |
| 3502 | | 308 | BSW (Whit-worth) | Mano Hand Main | 223 | HSS | | ● | ○ | | | | ○ | | | | | ● | ● | ● | | | ● | | | |
| 3546 | | 309 | BSPP (Gas) | Mano Hand Main | 24231 | HSSE 5% Co | | ● | ○ | | | ● | ● | | | | | ● | ● | ● | | | ● | | | |
| 3506 | | 309 | BSPP (Gas) | Mano Hand Main | 24231 | HSS | | ● | ○ | | | | ○ | | | | | ● | ● | ● | | | ● | | | |
| 3519 | | 310 | BSPT (RC) | Mano Hand Main | 24231 | HSS | | ● | ○ | | | | ○ | | | | | ● | ● | ● | | | ● | | | |
| 3509 | | 310 | PG | Mano Hand Main | 40434 | HSS | | ● | ○ | | | | ○ | | | | | ● | ● | ● | | | ● | | | |

## ACCESORIOS ROSCADO - Threading Accesories - Accesoires de taraudage

**GIRA-MACHOS**
Tap Wrench
Porte-taraud

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**GIRA-MACHOS CRIQUÉ**
Tap Wrench
Porte-taraud

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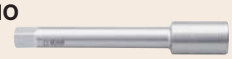
**GALGA**
Pitch Gauge
Jauge

**Pag. 312**

**ALARGADOR MACHOS MÁQUINA**
Machine Tap Extension
Rallonge tarauds machine

**Pag. 313**

**ALARGADOR MACHOS MANO**
Hand Tap Extension
Rallonge tarauds à main

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**PORTA-MACHOS COMPENSACIÓN RADIAL/AXIAL**
Radial/Axial Compensation Tap Holder
Porte-tarauds compensation rayon / axe

**Pag. 314**

**ADAPTADOR PORTA-MACHOS DE CAMBIO RÁPIDO CON EMBRAGUE**
Quick Change Tap Collet with Safety Clutch
Adaptateur porte-tarauds changement rapide avec embrayage

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**PORTA-COJINETES**
Die Holder
Porte filières

**Pag. 315**

**PORTA-COJINETES ISO 529**
ISO 529 Die Holder
Porte filières ISO 529

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**EXTRACTOR TORNILLOS**
Screw Extractor
Extracteur vis

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**INSERTO REPARACIÓN ROSCAS**
Thread Repair Insert
Filet rapportés

**Pag. 318**

**MACHO PARA INSERTO REPARACIÓN ROSCAS**
Thread Repair Insert Tap
Taraud filet rapportés

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**INSERTADOR**
Fitting Tool
Appareil de pose

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**ROMPE ARRASTRES**
Pin-Breaker
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**Pag. 320**

# FRESAS METAL DURO
## Carbide End Mills
## Fraises carbure

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

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| Ref. | | Pag. | DIN | Tipo Type | Material | Recubr. Coating Revêt. | P | | | | | M | K | | S | N | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 9644 | 4-5 Z | 324 | IZAR Std. | NR | Micro-grano | CROMAX | ● | ● | ● | | | | ● | ● | ● | ● | | | | | | | | |
| 9647 | 3 Z | 325 | IZAR Std. | WR | Micro-grano | CROMAX | | | | | ● | ● | | | ● | | | | | ● | | | | |
| 9444 New! | 4 Z | 326 | 6528 | N | Grano MG | CROMAX | | ● | ● | | ● | ● | ● | ● | | ● | ● | | | | | | | |
| 9405 | 6-8 Z | 328 | 6528 | N | Grano UF | IKRA | | ● | ● | ○ | | | | | | | | | | | | | | ● |
| 9415 | 6-8 Z | 328 | 6528 | N | Grano UF | IKRA | | ● | ● | ○ | | | | | | | | | | | | | | ● |
| 9406 | 4-5 Z | 329 | 6528 | N | Grano UF | IKRA | | ● | ● | | ● | ● | ● | ● | ● | ○ | ○ | | | | | | | ● |
| 9446 3D | 4-5 Z | 330 | 6528 | N | Grano UF | IKRA | | ● | ● | | ● | ● | ● | ● | ● | ○ | ○ | | | | | | | ○ |
| 9447 3D | 4-5 Z | 331 | 6528 | N | Grano UF | IKRA | | ● | ● | | ● | ● | ● | ● | ● | ○ | ○ | | | | | | | ○ |
| 9461 | 4 Z | 332 | 6528 | N | Grano UF | IKRA | | ● | ● | ● | | | | | | | | | | | | | | ● |
| 9401 | 4 Z | 334 | 6528 | N | Micro-grano | CROMAX | ● | ● | ○ | | ○ | ○ | ● | ● | ○ | ● | ● | ○ | ○ | ○ | ○ | ● | | |
| 9410 | 4 Z | 335 | IZAR Std. | N | Micro-grano | CROMAX | ● | ● | ○ | | ○ | ○ | ● | ● | ○ | ● | ● | ○ | ○ | ○ | ○ | ● | | |
| 9412 | 4 Z | 336 | 6528 | N | Micro-grano | CROMAX | ● | ● | ○ | | ○ | ○ | ● | ● | ○ | ● | ● | ○ | ○ | ○ | ○ | ● | | ○ |
| 9407 | 4 Z | 337 | IZAR Std. | N | Micro-grano | CROMAX | ● | ● | ○ | | ○ | ○ | ● | ● | ○ | ● | ● | ○ | ○ | ○ | ○ | ● | | ○ |
| 9431 | 3 Z | 338 | 6528 | N | Micro-grano | CROMAX | ● | ● | ● | | | | ● | ● | ○ | | | | | | | | | |
| 9436 | 3 Z | 339 | 6528 | W | Micro-grano | CROMAX | ● | ● | | | ● | ● | | | | ● | ● | ● | ● | ● | ○ | ○ | | |
| 9437 | 3 Z | 341 | IZAR Std. | W | Micro-grano | IRIS | | | | | | | | | | ● | ● | ● | ● | ● | | | ○ | |
| 9439 | 3 Z | 342 | 6528 | W | Micro-grano + | IRIS | | | | | | | | | | ● | ● | ● | ● | ● | | | | |
| 9460 | 2 Z | 343 | 6528 | N | Grano UF | IKRA | | ● | ● | ● | | | | | | | | | | | | | | ● |
| 9421 | 2 Z | 344 | 6528 | N | Micro-grano | CROMAX | ● | ● | ○ | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | ○ | | |
| 9424 | 2 Z | 345 | IZAR Std. | N | Micro-grano | CROMAX | ● | ● | ○ | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | ○ | | |
| 9427 | 2 Z | 346 | IZAR Std. | W | Micro-grano + | IRIS | | | | | | | | | | ● | ● | ● | ● | ● | | | | |

P: <850 N/mm² · < 1000 N/mm² · 1000-1300 N/mm² · ANTIDESGASTE Wear-Resistant Anti-Usure · MARTENSÍTICO Martensitic Martensitique
M: INOX AUSTENÍTICO Austenitic Stainless Steel - Aciers inox austénitique
K: < 700 N/mm² · 700-1000 N/mm² · FUNDICIÓN Cast Iron Fonte
S: ALEACIONES TERMORRESISTENTES Heat-Resistant Alloys - Alliages thermorésistants
N: VIRUTA CORTA Short Chip - Copeaux courts · VIRUTA LARGA Long Chip - Copeaux longs · NO ALEADO Unalloyed - Sans alliage · < 10% Si · > 10% Si · TERMOPLÁSTICOS Thermoplastics - Thermoplastiques · DUROPLÁSTICOS Hard Plastics - Plastiques durs · Cu - BRONCE LATÓN Copper Bronze Brass Cuivre Bronze Laiton · ALUMINIO - MAGNESIO Aluminium - Magnesium
F: Composites de Fibras Fiber Composites Composites en fibre
H: 45-70 HRC

# TABLA USO FRESADO METAL DURO

## Carbide Milling Use Table - Tableau usage Fraisage carbure

| Ref. | | Pag. | DIN | Tipo Type | Material | Recubr. Coating Revêt. | P | | | | | M | K | | S | N | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 9429 | 2 Z | 347 | IZAR Std. | W | Micro-grano + | IRIS | | | | | | | | | | ● | ● | ● | ● | ● | | | | |
| 9465 | 2 Z | 348 | IZAR Std. | | Grano UF | SUA | | | ● | ● | ● | ○ | | ○ | | | | | | | | | | ● |
| 9425 | 2 Z | 350 | 6528 | N | Micro-grano | CROMAX | ● | ● | ○ | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | ○ | | ○ |
| 9426 | 2 Z | 351 | IZAR Std. | N | Micro-grano | CROMAX | ● | ● | ○ | | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ○ | ○ | | ○ |
| 9470 | 2 Z | 353 | IZAR Std. | | Grano UF | SUA | ○ | ○ | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | ○ |
| 9475 | 2 Z | 354 | IZAR Std. | | Grano UF | SUA | ○ | ○ | ● | ● | ● | ● | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | ○ |
| 9441 | 1 Z | 356 | IZAR Std. | | Micro-grano + | IRIS | | | | | | | | | | | | ● | ● | ● | ● | ○ | ○ | |
| 9416 | 1 Z | 357 | IZAR Std. | | Micro-grano + | IRIS | | | | | | | | | | | | ● | ● | ● | ● | ● | ○ | |
| 9417 | 1 Z | 358 | IZAR Std. | | Micro-grano + | IRIS | | | | | | | | | | | | ● | ● | ● | ● | ● | ○ | |
| 9456 L | 1 Z | 359 | IZAR Std. | | Micro-grano + | IRIS | | | | | | | | | | | | ● | ● | ● | ● | ○ | ○ | |
| 9419 | 1 Z | 360 | IZAR Std. | | Micro-grano + | ALTIN | | | | | | | | | | | | ● | ● | ● | | | ○ | |
| 9413 | 1 Z | 361 | | | | CARBEX | | | | | | | | | | | | ● | ● | ● | ● | ○ | ○ | |
| 9411 | 1 Z | 362 | IZAR Std. | | Micro-grano + | ALTIN | | | | | | | | | | | | ● | ● | ● | ● | ○ | ○ | |
| 9414 | 1 Z | 363 | IZAR Std. | | Micro-grano + | | | | | | | | | | | | | ● | ● | ● | | | ○ | |
| 1689 | 2 Z | 364 | IZAR Std. | | Micro-grano | | | | | | | | | | | ○ | ○ | ○ | ○ | ○ | ● | ○ | ● | |
| 9453 | 3 Z | 366 | IZAR Std. | | Grano UF | SUA | ● | ● | ● | ● | ● | ○ | ● | ● | ● | ● | | ● | ● | | | | | |
| 9455 | 3-4 Z | 367 | IZAR Std. | | Grano UF | SUA | ● | ● | ● | ● | ● | ○ | ● | ● | ● | ● | | ● | | | | | | |
| 9457 | 3 Z | 368 | IZAR Std. | | Grano UF | SUA | ● | ● | ● | ● | ● | ○ | ● | ● | ● | ● | | ● | | | | | | |
| 9450 | 2 Z | 369 | IZAR Std. | | Grano UF | SUA | ● | ● | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | |
| 9451 | 4-6 Z | 371 | IZAR Std. | | Micro-grano | TIALCN | ○ | ● | ● | ○ | ○ | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | ● |
| 9454 | 4 Z | 372 | IZAR Std. | | Grano UF | TIALCN | ● | ● | ● | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | | ○ |
| 9452 | 2 Z | 372 | IZAR Std. | | Grano UF | TIALCN | ● | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ● | ● | ● | ○ | ○ | | ○ |
| 9459 | 1 Z | 373 | IZAR Std. | | Micro-grano | | ● | ○ | | | | | | | | ● | ● | ● | ○ | ○ | ○ | | ○ | |
| 9280 | | 375 | | | Micro-grano | | | | | | | | | | | | | | | | ● | ● | ● | |
| 9281 | | 376 | IZAR Std. | | Micro-grano + | DIAMAX | | | | | | | | | | | | | | | ● | ● | ● | |
| 9282 | 6-8 Z | 377 | IZAR Std. | | Micro-grano + | DIAMAX | | | | | | | | | | | | | | | ● | ● | ● | |
| 9283 | 6 Z | 378 | IZAR Std. | | Micro-grano + | DIAMAX | | | | | | | | | | | | | | | ● | ● | ● | |
| 9330 New! | | 380 | IZAR Std. | | Micro-grano | ALTIN | ● | ● | ○ | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | | |
| 9333 New! | | 381 | IZAR Std. | | Micro-grano | ALTIN | ● | ● | ○ | | ● | ● | ● | | ● | ● | ● | ● | ● | ● | | | | ○ |

# FRESAS PMX - HSSE - HSS
## PMX - HSSE - HSS End Mills
## Fraises PMX - HSSE - HSS

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

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| Ref. | | Pag. | DIN | Tipo Type | Material | Recubr. Coating Revêt. | P | | | | | M | K | | S | N | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 6644 | 4-6 Z | 388 | 844 | NR-F | PMX | TIALN-TOP | | ● | ○ | | ● | | | | ● | | | | | | | | | |
| 6696 | 4-6 Z | 388 | 844 | NR-F | PMX | TIALN-TOP | | ● | ○ | | ● | | | | ● | | | | | | | | | |
| 6647 | 4-5 Z | 389 | 844 | NR-F | PMX | TIALN-TOP | | | | | | ● | | | | | | | | | | | | |
| 6640 | 4-6 Z | 390 | 844 | NR | PMX | TIALN-TOP | ● | | | | | | | | | ○ | ○ | ● | ● | ● | | | | |
| 6690 | 4-6 Z | 390 | 844 | NR | PMX | TIALN-TOP | ● | | | | | | | | | ○ | ○ | ● | ● | ● | | | | |
| 6642 | 4-5 Z | 391 | 844 | NF | PMX | TIALN-TOP | ● | | | | | | | | ● | ○ | ○ | | | | | | | |
| 6692 | 4 Z | 391 | 844 | NF | PMX | TIALN-TOP | ● | | | | | | | | ● | ○ | ○ | | | | | | | |
| 6444 | 3 Z | 392 | 844 | NR-F | PMX | TIALN-TOP | | ● | ○ | | ● | | | | | | | | | | | | | |
| 4644 | 3-5 Z | 393 | 844 | NR-F | HSSE 8% Co | TIALSIN | | ● | | | | | ● | ● | ● | ● | ● | | | | | | | |
| 4696 | 4-5 Z | 393 | 844 | NR-F | HSSE 8% Co | TIALSIN | | ● | | | | | ● | ● | ● | ● | ● | | | | | | | |
| 4640 | 4-6 Z | 394 | 844 | NR | HSSE 8% Co | TIALSIN | ● | | | | | | ○ | ○ | | ○ | ○ | | | | | | | |
| 4690 | 4-6 Z | 395 | 844 | NR | HSSE 8% Co | TIALSIN | ● | | | | | | ○ | ○ | | ○ | ○ | | | | | | | |
| 4680 | 4-6 Z | 396 | 844 | NF | HSSE 8% Co | TIALSIN | ● | | | | | | ○ | ○ | | ○ | ○ | | | | | | | |
| 4692 | 4-6 Z | 397 | 844 | NF | HSSE 8% Co | TIALSIN | ● | | | | | | ○ | ○ | | ○ | ○ | | | | | | | |
| 4447 | 3 Z | 398 | 844 | WR | HSSE 8% Co | TIALSIN | ● | | | | | | | | | ● | ● | ● | ● | ● | | | | |
| 4497 | 3 Z | 398 | 844 | WR | HSSE 8% Co | TIALSIN | ● | | | | | | | | | ● | ● | ● | ● | ● | | | | |

# FRESAS PMX - HSSE - HSS
## PMX - HSSE - HSS End Mills
## Fraises PMX - HSSE - HSS

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

Sets pag. 422

| Ref. | | Pag. | DIN | Tipo Type | Material | Recubr. Coating Revêt. | P.1 <850 N/mm² | P.2 <1000 N/mm² | P.3 1000-1300 N/mm² | P.4 ANTIDESGASTE Wear-Resistant Anti-Usure | P.5 MARTENSÍTICO Martensitic Martensitique | M INOX AUSTENÍTICO Austenitic Stainless Steel - Aciers inox austénitique | K.1 FUNDICIÓN Cast Iron Fonte < 700 N/mm² | K.2 FUNDICIÓN Cast Iron Fonte 700-1000 N/mm² | S ALEACIONES TERMORRESISTENTES Heat-Resistant Alloys - Alliages thermorésistants | N.1 Cu - BRONCE LATÓN Copper Bronze Brass Cuivre Bronze Laiton VIRUTA CORTA Short Chip - Copeaux courts | N.2 VIRUTA LARGA Long Chip - Copeaux longs | N.3 ALUMINIO - MAGNESIO Aluminium - Magnesium NO ALEADO Unalloyed - Sans alliage | N.4 < 10% Si | N.5 > 10% Si | N.6 TERMOPLÁSTICOS Thermoplastics - Thermoplastiques | N.7 DUROPLÁSTICOS Hard Plastics - Plastiques durs | F Composites de Fibras Fiber Composites Composites en fibre | H 45-70 HRC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | P | | | | | M | K | | S | N | | | | | | | F | H |
| | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 6666 | 4-6 Z | 400 | 844 | N | PMX | TIALN-TOP | | ● | ○ | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| 6600 | 4-6 Z | 401 | 844 | N | PMX | TIALN-TOP | | ● | ○ | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| 6606 | 4-6 Z | 401 | 844 | N | PMX | TIALN-TOP | | ● | ○ | | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| 6604 | 4 Z | 402 | 844 | N | PMX | TIALN-TOP | ● | ○ | | | | | | | ● | ● | ● | | | | | | | |
| 6430 | 3 Z | 403 | 844 | W | PMX | TIALN-TOP | | | | | | ● | | | ● | ● | ● | ● | ● | ● | | | | |
| 6439 | 3 Z | 404 | 844 | N | PMX | TIALN-TOP | | ● | ○ | | ● | | | | | | | | | | | | | |
| 6420 | 2 Z | 405 | 327 | N | PMX | TIALN-TOP | ● | ● | ○ | | | ○ | ● | ● | ● | ● | ● | ● | ● | ● | | | | |
| 4600 | 4-6 Z | 406 | 844 | N | HSSE 8% Co | TIALSIN | ● | | | | | | ● | ● | | ● | ● | | | | | | | |
| 4606 | 4-6 Z | 407 | 844 | N | HSSE 8% Co | TIALSIN | ● | | | | | | ● | ● | | ● | ● | | | | | | | |
| 4400 | 4-6 Z | 408 | 844 | N | HSSE 8% Co | TIALSIN | ● | | | | | | ● | ● | | ● | ● | | | | | | | |
| 4430 | 3 Z | 409 | 844 | W | HSSE 8% Co | TIALSIN | | ● | | | | | | | | | | ● | ● | ● | | | | |
| 4432 | 3 Z | 410 | 844 | W | HSSE 8% Co | TIALSIN | | ● | | | | | | | | | | ● | ● | ● | | | | |
| 4439 | 3 Z | 411 | 844 | N | HSSE 8% Co | TIALSIN | | ● | | | | | ○ | ○ | ● | ● | ● | | | | | | | |
| 4420 | 2 Z | 412 | 327 | N | HSSE 8% Co | TIALSIN | ● | | | | | | ● | ● | | ● | ● | ● | ● | ● | | | | |
| 4426 | 2 Z | 413 | IZAR Std. | N | HSSE 8% Co | TIALSIN | ● | | | | | | ● | ● | | ● | ● | ● | ● | ● | | | | |
| 4422 | 2 Z | 414 | 327 | N | HSSE 8% Co | TIALSIN | ● | | | | | | ○ | ○ | | ● | ● | | | | | | | |
| 4470 | 2 Z | 415 | IZAR Std. | N | HSSE 8% Co | TIALSIN | ● | | | | | | ○ | ○ | | ● | ● | | | | | | | |

# FRESAS PMX - HSSE - HSS
## PMX - HSSE - HSS End Mills
## Fraises PMX - HSSE - HSS

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

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| Ref. | | Pag. | DIN | Tipo Type | Material | Recubr. Coating Revêt. | P | | | | | M | K | | S | N | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 4410 | 1 Z | 416 | IZAR Std. | W | HSSE 5% Co | | | | | | | | | | | | | ● | ● | ● | ● | | | |
| 4411 | 1 Z | 416 | IZAR Std. | W | HSSE 5% Co | | | | | | | | | | | | | ● | ● | ● | ● | | | |
| 4401 | 4-8 Z | 417 | 844 | N | HSS | | ● | | | | | | | | | | | | | | | | | |
| 4421 | 2 Z | 418 | 327 | N | HSS | | ● | | | | | | | | | | | | | | | | | |
| 4412 | 1 Z | 419 | IZAR Std. | W | HSS | | | | | | | | | | | | | ● | ● | ● | ● | | | |
| 4413 | 1 Z | 419 | IZAR Std. | W | HSS | | | | | | | | | | | | | ● | ● | ● | ● | | | |
| 4414 | 1 Z | 420 | IZAR Std. | W | HSS | | | | | | | | | | | | | ● | ● | ● | ● | | | |
| 4415 | 1 Z | 420 | IZAR Std. | W | HSS | | | | | | | | | | | | | ● | ● | ● | ● | | | |
| 4416 | 1 Z | 421 | IZAR Std. | W | HSS | | | | | | | | | | | | | ● | ● | ● | ● | | | |
| 4417 | 1 Z | 421 | IZAR Std. | W | HSS | | | | | | | | | | | | | ● | ● | ● | ● | | | |

**SETS FRESADO METAL DURO**
Carbide Milling Sets
Jeux de fraisage carbure

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**SETS FRESADO PMX - HSSE**
PMX – HSSE Milling Sets
Jeux de fraisage PMX - HSSE

**Pag. 422**

# TABLA USO FRESADO PMX - HSSE - HSS

PMX - HSSE - HSS Milling Use Table - Tableau usage Fraisage PMX - HSSE - HSS

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

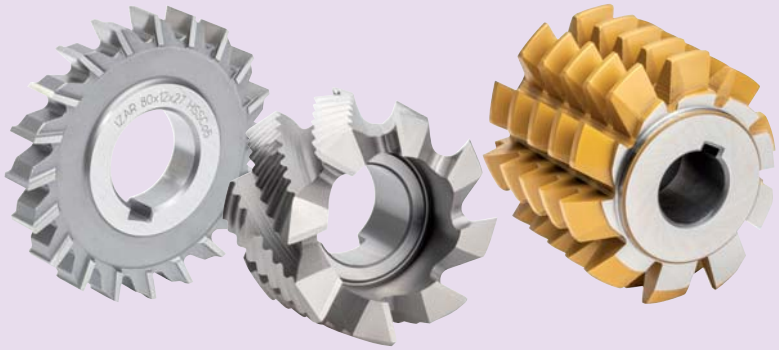
| Ref. | | Pag. | DIN | Tipo Type | Material | Recubr. Coating Revêt. | P | | | | | M | K | | S | N | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| | | | | | | | <850 N/mm² | < 1000 N/mm² | 1000-1300 N/mm² | ANTIDESGASTE Wear-Resistant Anti-Usure | MARTENSÍTICO Martensitic Martensitique | INOX AUSTENÍTICO Austenitic Stainless Steel - Aciers inox austénitique | < 700 N/mm² | 700-1000 N/mm² | ALEACIONES TERMORRESISTENTES Heat-Resistant Alloys - Alliages thermorésistants | VIRUTA CORTA Short Chip - Copeaux courts | VIRUTA LARGA Long Chip - Copeaux longs | NO ALEADO Unalloyed - Sans alliage | < 10% Si | > 10% Si | TERMOPLÁSTICOS Thermoplastics - Thermoplastiques | DUROPLÁSTICOS Hard Plastics - Plastiques durs | Composites de Fibras Fiber Composites Composites en fibre | 45-70 HRC |
| | | | | | | | | | | | | | FUNDICIÓN Cast Iron Fonte | | | Cu - BRONCE LATÓN Copper Bronze Brass Cuivre Bronze Laiton | | ALUMINIO - MAGNESIO Aluminium - Magnesium | | | | | | |

## FRESAS ESPECIALES - Shank Tools - Fraises specials

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4800 | 6-10 Z | 429 | 851 AA | N | HSSE 8% Co | TIALSIN | ● | ○ | | | | | ○ | ○ | | ○ | ○ | ○ | ○ | ● | | | | | |
| 4802 | 4-6 Z | 429 | 851 AB | NR | HSSE 8% Co | TIALSIN | ● | ○ | | | | | ○ | ○ | | ○ | ○ | ○ | ○ | ● | | | | | |
| 4834 | 6-14 Z | 430 | 850 D | N | HSSE 8% Co | TIALSIN | ● | ○ | | | | | ○ | ○ | | ○ | ○ | ○ | ○ | ● | | | | | |
| 5080 | 4-6 Z | 431 | 6518 B | N | HSSE 8% Co | TIALSIN | ● | ○ | | | | | ○ | ○ | | ○ | ○ | ○ | ○ | ● | | | | | |
| 4330 | 8-12 Z | 432 | 1833 A | N | HSSE 8% Co | TIALSIN | ● | ○ | | | | | ○ | ○ | | ○ | ○ | ○ | ○ | ● | | | | | |
| 4340 | 8-12 Z | 432 | 1883 B | N | HSSE 8% Co | | ● | ○ | | | | | ○ | ○ | | ○ | ○ | ○ | ○ | ● | | | | | |
| 9674 | **Dentado** / **Teeth** / Denture: **2** | 433 | IZAR Std. | | | | | | | | | | | | | ○ | ○ | ● | ● | ● | ● | | | | |
| 4810 | 8-12 Z | 434 | 851 B | N | HSSE 8% Co | | ● | ○ | | | | | ○ | ○ | | ○ | ○ | ○ | ○ | ● | | | | | |

## FRESAS CÓNICAS - Taper Shank End Mills - Fraises coniques

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4675 | 4-6 Z | 435 | 845 B | NR-F | HSSE 8% Co | TIALSIN | ● | ○ | | | | | | | | | | | | | | | | | |
| 4570 | 4-8 Z | 436 | 845 B | NR | HSSE 8% Co | | ● | ○ | | | | | | | | | | | | | | | | | |
| 4580 | 4-8 Z | 436 | 845 B | NR | HSSE 8% Co | | ● | ○ | | | | | | | | | | | | | | | | | |
| 4610 | 4-8 Z | 437 | 845 B | N | HSSE 8% Co | TIALSIN | ● | ○ | | | | | | | | | | | | | | | | | |
| 4516 | 4-8 Z | 437 | 845 B | N | HSSE 8% Co | TIALSIN | ● | ○ | | | | | | | | | | | | | | | | | |
| 4550 | 2 Z | 438 | 326 D | N | HSSE 8% Co | | ● | ○ | | | | | | | | | | | | | | | | | |

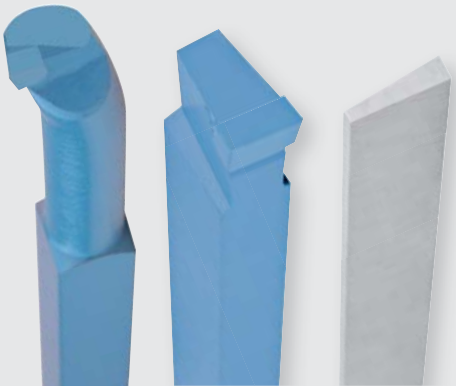


**FRESAS AGUJERO / FRESAS MADRE**
Milling Cutters / Gear Hobs
Fraises â trou

**Pag. 439**

**SIERRAS CINTA - CIRCULARES**
Band Saw Blades - Slitting Saws
Scies à ruban - Fraises scies

**Pag. 467**



**TORNEADO**
Turning
Tournage

**Pag. 489**

**HERRAMIENTAS SOLDADAS**
Brazed Turning Tools
Outils de tour plaquette soudé

**CUCHILLAS HSSE**
HSSE Turning Blades
Outils de tour HSSE

**ACCESORIOS**
Accessories
Accessoires

**Pag. 641**

**CONOS PORTAPLAQUITAS**
Tool-Holder Adaptors
Adaptateurs Porte-Plaquettes

New!
**PINZAS**
Collets
Pinces

UNI Universal
INOX Heavy Duty
ALU Non Ferrous
STD Standard
TOP Top Line
MULTI Multiusos

New!

**ACEITES DE CORTE Y REFRIGERANTES**
Cutting Oils & Water Soluble Fluids
Huiles de coupe et lubrifiants

**Pag. 649**

## TABLA USO FRESADO METAL DURO
Carbide Milling Use Table - Tableau usage Fraisage carbure

# FRESAS ROTATIVAS
## Rotary Burrs
## Fraises limes rotatives

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

Sets pag. 465

| Ref. | | Pag. | Tipo Type | Norma Norm | Material | Rec. Coat. Revêt. | Dent. | P | | | | | M | K | | S | N | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 9260 | **Dentado** / **Teeth** / Denture: **1-3-4-6** | 454 | B | ZYA-S | MD/HM/ Carbure | ALTIN | 1 | | | | | | | | | | | | ● | ● | ● | ● | ● | | |
| | | | | | | | 3 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| | | | | | | | 4 | ○ | ○ | | | ● | ● | ○ | ○ | ● | ○ | ○ | | | | ● | ● | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| 9240 | **Dentado** / **Teeth** / Denture: **3-6** | 454 | B | ZYA-S | MD/HM/ Carbure | | 3 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| 9250 | **Dentado** / **Teeth** / Denture: **1-3-4-6** | 455 | A | ZYA | MD/HM/ Carbure | ALTIN | 1 | | | | | | | | | | | | ● | ● | ● | ● | ● | | |
| | | | | | | | 3 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| | | | | | | | 4 | ○ | ○ | | | ● | ● | ○ | ○ | ● | ○ | ○ | | | | ● | ● | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| 9230 | **Dentado** / **Teeth** / Denture: **6** | 455 | A | ZYA | MD/HM/ Carbure | | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| 9251 | **Dentado** / **Teeth** / Denture: **1-3-4-6-S-M** | 456 | C | WRC | MD/HM/ Carbure | ALTIN New! | 1 | | | | | | | | | | | | ● | ● | ● | ● | ● | | |
| | | | | | | | 3 | ● | ● | ● | | ● | ○ | ● | ● | ● | ● | ● | | | | | | | | |
| | | | | | | | 4 | ○ | ○ | | | ● | ○ | ○ | ○ | ● | ○ | ○ | | | | | ● | ● | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ○ | ● | ● | ● | ● | ● | | | | | | | | |
| | | | | | | | S | | | | | | | | | ● | | | | | | | | | |
| | | | | | | | M | | | | | | ● | | | | | | | | | | | | |
| 9231 | **Dentado** / **Teeth** / Denture: **6** | 456 | C | WRC | MD/HM/ Carbure | | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| 9252 | **Dentado** / **Teeth** / Denture: **3-4-6** | 457 | N | WKN | MD/HM/ Carbure | | 3 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| | | | | | | | 4 | ○ | ○ | | | ● | ● | ○ | ○ | ● | ○ | ○ | | | | ● | ● | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| 9254 | **Dentado** / **Teeth** / Denture: **1-3-4-6-M** | 458 | G | SPG | MD/HM/ Carbure | ALTIN New! | 1 | | | | | | | | | | | | ● | ● | ● | ● | ● | | |
| | | | | | | | 3 | ● | ● | ● | | ● | ○ | ● | ● | ● | ● | ● | | | | | | | | |
| | | | | | | | 4 | ○ | ○ | | | ● | ○ | ○ | ○ | ● | ○ | ○ | | | | ● | ● | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ○ | ● | ● | ● | ● | ● | | | | | | | | |
| | | | | | | | M | | | | | | ● | | | | | | | | | | | | |
| 9255 | **Dentado** / **Teeth** / Denture: **1-3-4-6** | 459 | M | SKM | MD/HM/ Carbure | | 1 | | | | | | | | | | | | ● | ● | ● | ● | ● | | |
| | | | | | | | 3 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| | | | | | | | 4 | ○ | ○ | | | ● | ● | ○ | ○ | ● | ○ | ○ | | | | | ● | ● | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| 9256 | **Dentado** / **Teeth** / Denture: **3-4-6** | 459 | K | KSK | MD/HM/ Carbure | | 3 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |
| | | | | | | | 4 | ○ | ○ | | | ● | ● | ○ | ○ | ● | ○ | ○ | | | | | ● | ● | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | | |

# FRESAS ROTATIVAS
## Rotary Burrs
## Fraises limes rotatives

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

Sets pag. 465

| Ref. | | Pag. | Tipo Type | Norma Norm | Material | Rec. Coat. Revêt. | Dent. | P | | | | | M | K | | S | N | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | <850 N/mm² | < 1000 N/mm² | 1000-1300 N/mm² | ANTIDESGASTE Wear-Resistant Anti-Usure | MARTENSÍTICO Martensitic Martensitique | INOX AUSTENÍTICO Austenitic Stainless Steel - Aciers inox austénitique | < 700 N/mm² | 700-1000 N/mm² | ALEACIONES TERMORRESISTENTES Heat-Resistant Alloys - Alliages thermorésistants | VIRUTA CORTA Short Chip - Copeaux courts | VIRUTA LARGA Long Chip - Copeaux longs | NO ALEADO Unalloyed - Sans alliage | < 10% Si | > 10% Si | TERMOPLÁSTICOS Thermoplastics - Thermoplastiques | DUROPLÁSTICOS Hard Plastics - Plastiques durs | Composites de Fibras Fiber Composites Composites en fibre | 45-70 HRC |
| | | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| **9257** | **Dentado** / **Teeth** / Denture: **1-3-4-6-M** | **460** | E | TRE | **MD/HM/** Carbure | New! | 1 | | | | | | | | | | | | ● | ● | ● | ● | ● | | |
| | | | | | | | 3 | ● | ● | ● | | ● | ○ | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | | | 4 | ○ | ○ | | | ● | ○ | ○ | ○ | ● | ○ | ○ | | | | ● | ● | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ○ | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | | | M | | | | | | ● | | | | | | | | | | | | |
| **9237** | **Dentado** / **Teeth** / Denture: **3-6** | **460** | E | TRE | **MD/HM/** Carbure | | 3 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| **9258** | **Dentado** / **Teeth** / Denture: **1-3-4-6-M** | **461** | D | KUD | **MD/HM/** Carbure | ALTIN New! | 1 | | | | | | | | | | | | ● | ● | ● | ● | ● | | |
| | | | | | | | 3 | ● | ● | ● | | ● | ○ | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | | | 4 | ○ | ○ | | | ● | ○ | ○ | ○ | ● | ○ | ○ | | | | ● | ● | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ○ | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | | | M | | | | | | ● | | | | | | | | | | | | |
| **9238** | **Dentado** / **Teeth** / Denture: **3-6** | **461** | D | KUD | **MD/HM/** Carbure | | 3 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| **9266** | **Dentado** / **Teeth** / Denture: **1-3-4-6** | **462** | H | B | **MD/HM/** Carbure | | 1 | | | | | | | | | | | | ● | ● | ● | ● | ● | | |
| | | | | | | | 3 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | | | 4 | ○ | ○ | | | ● | ● | ○ | ○ | ● | ○ | ○ | | | | ● | ● | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| **9267** | **Dentado** / **Teeth** / Denture: **1-3-4-6** | **463** | L | KEL | **MD/HM/** Carbure | ALTIN | 1 | | | | | | | | | | | | ● | ● | ● | ● | ● | | |
| | | | | | | | 3 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | | | 4 | ○ | ○ | | | ● | ● | ○ | ○ | ● | ○ | ○ | | | | ● | ● | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| **9247** | **Dentado** / **Teeth** / Denture: **6** | **463** | L | KEL | **MD/HM/** Carbure | | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | |
| **9268** | **Dentado** / **Teeth** / Denture: **1-3-4-6-M** | **464** | F | RBF | **MD/HM/** Carbure | ALTIN New! | 1 | | | | | | | | | | | | ● | ● | ● | ● | ● | | |
| | | | | | | | 3 | ● | ● | ● | | ● | ○ | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | | | 4 | ○ | ○ | | | ● | ○ | ○ | ○ | ● | ○ | ○ | | | | ● | ● | | |
| | | | | | | | 6 | ● | ● | ● | | ● | ○ | ● | ● | ● | ● | ● | | | | | | | |
| | | | | | | | M | | | | | | ● | | | | | | | | | | | | |
| **9248** | **Dentado** / **Teeth** / Denture: **6** | **464** | F | RBF | **MD/HM/** Carbure | | 6 | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | | | | | | |

## TABLA USO BROCAS DE CABEZA INTERCAMBIABLE
Drill Bits With Interchangeable Heads Use Table - Tableau usage forets à tête interchangeable

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

| Ref. | | Pag. | DIN | Tipo Type | Material | Recubr. Coating Revêt. | P | | | | | M | K | | S | N | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 8380 New! | | 510 | | | Micro-grano | ALTIN | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | |
| 8381 New! | | 511 512 513 | ISO 9766 | 3XD 5XD 8XD | | | | | | | | | | | | | | | | | | | | |



## TABLA USO PLAQUITAS MD
HM Inserts Use Table - Tableau usage Plaquettes carbure

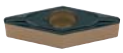
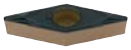
## TALADRADO - Drilling - Perçage

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8450 | | 515 | | WCMX |
| 8425 | | 515 | | ISO 9766 (3XD) |
| 8465 | | 517 | | SOGX |
| 8470 | | 517 | | SOMX |
| 8475 | | 518 | | TOMX |
| 8460 | | 518 | | DOEX |
| 8431 | | 519 | | SPS.. 90° |
| 8432 | | 519 | | SPS.. 90° |
| 8430 | | 520 | | SPS.. 60° |

| | | | |
|---|---|---|---|
| Set 8431 | | **SET PORTA-PLAQUITAS PUNTEADO SPS.. 90°**<br>SPS.. 90° Spotting Tool-Holder Set<br>Jeu de porte-plaquettes de repérage SPS.. 90°<br> | 519 |
| Set 8432 | | **SET PORTA-PLAQUITAS PUNTEADO SPS.. 90°**<br>SPS.. 90° Spotting Tool-Holder Set<br>Jeu de porte-plaquettes de repérage SPS.. 90°<br> | 519 |

# TORNEADO - Turning - Tournage

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8500 | | 530 | + | CCMT |
| 8501 | | 531 | + | CCGT |
| 8510 | | 532 | - | CNMG |
| 8512 | | 534 | - | CNMM |
| 8515 | | 534 | + | DCGT |
| 8520 | | 535 | + | DCMT |
| 8530 | | 536 | - | DNMG |
| 8535 | | 537 | - | KNUX |
| 8536 | New! | 538 | + | RCGT |
| 8537 | New! | 538 | + | RCMT |
| 8540 | | 539 | + | SCMT |
| 8550 | | 540 | - | SNMG |

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8554 | | 540 | + | SPUN |
| 8558 | | 541 | + | TCGT |
| 8560 | | 541 | + | TCMT |
| 8570 | | 542 | - | TNMG |
| 8571 | | 544 | + | TPMR |
| 8572 | | 544 | + | TPUN |
| 8575 |  | 545 | + | VBMT |
| 8576 | | 545 | + | VCGT |
| 8577 |  | 546 | + | VCMT |
| 8578 | | 546 | - | VNMG |
| 8580 | | 547 | - | WNMG |

## Porta-Plaquitas Torneado Exterior - External Turning Tool-Holder - Porte-Plaquettes tournage extérieur

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8726 | | 552 | - | CKJN -93° |
| 8706 | | 552 | + | CSBP. -75° |
| 8707 | | 553 | + | CTGP. -90° |
| 8792 | New! | 554 | - | DDJN. -93° |
| 8790 | | 555 | - | DWLN. -95° |
| 8710 | | 555 | - | MCLN. -95° |
| 8700 | | 556 | - | MTJN. -93° |
| 8724 | | 556 | - | MVJN. -93° |
| 8770 | | 557 | - | MWLN. -95° |
| 8709 | | 557 | - | PCLN. -95° |

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8725 | | 558 | - | PDJN. -93° |
| 8791 | | 558 | - | PSSN -45° |
| 8711 | New! | 559 | - | PWLN. -95° |
| 8704 | | 560 | + | SCLC. -95° |
| 8729 | | 561 | + | SDJC. -93° |
| 8705 | New! | 561 | + | SRDCN |
| 8723 | New! | 562 | + | SSSC. -45° |
| 8703 | | 563 | + | STJC. -93° |
| 8727 | | 563 | + | SVJB -93° |
| 8728 | | 564 | + | SVJC -93° |

## TABLA USO PLAQUITAS MD
HM Inserts Use Table - Tableau usage Plaquettes carbure

# TORNEADO - Turning - Tournage

**Porta-Plaquitas Torneado Interior** - Internal Turning Tool-Holder - Porte-Plaquettes tournage intérieur

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8715 | | 564 | + | S-CTFP. -90° |
| 8731 | | 565 | - | S-MCLN. -95° |
| 8732 | | 565 | - | S-MTUN. -93° |
| 8769 | | 566 | - | S-MVUN -93° |
| 8780 | | 567 | - | S-MWLN. -95° |
| 8800 | | 567 | - | S-MWLN. -95° |

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8733 | | 568 | - | S-PCLN. -95° |
| 8765 | | 568 | - | S-PDUN. -93° |
| 8751 | | 569 | + | S-SCLC. -95° |
| 8761 | | 569 | + | S-SDUC. -93° |
| 8718 | | 570 | + | S-STFC. -90° |
| 8768 | | 570 | + | S-SVUC. -93° |

| Set 8799 | 589 | **SET DE TORNEADO** - Turning Inserts Set - Jeu de tournage |
|---|---|---|

Set 1

Set 2

Set 3

# TRONZADO Y RANURADO - Parting & Grooving - Tonçonnage et rainurage

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8600 | | 572 | | LFMX |
| 8601 | New! | 573 | | MGMN |
| 8603 | | 574 | EXT. | TN..ER.A |
| 8606 | | 575 | INT. | TN..IR.A |
| 8850 | | 576 | | XLCF |
| 8860 | | 576 | | MS-EN |
| 8870 | | 577 | | XLCFN |

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8875 | | 577 | | XLCFN |
| 8865 | | 578 | | XMCG |
| 8866 | New! | 579 | | S-GMGG |

| Set 8605 | **SET RANURADO SEEGER®**<br>Grooving Set Seeger®<br>Jeu rainurage Seeger®<br> **Ref. 8603 EXT.**<br> **Ref. 8606 INT.** | 575 |
|---|---|---|

## ROSCADO - Threading - Taraudage

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8610 | | 584 | EXT. PERFIL TOTAL | MÉTRICA 60° |
| 8615 | | 584 | EXT. PERFIL PARCIAL | TN..ER.M 60° |
| 8620 | | 585 | INT. PERFIL TOTAL | MÉTRICA 60° |
| 8625 | | 585 | INT. PERFIL PARCIAL | TN..IR.M 60° |
| 8612 | | 586 | EXT. PERFIL TOTAL | WHITWORTH 55° |
| 8622 | | 586 | INT. PERFIL TOTAL | WHITWORTH 55° |

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8820 | | 588 | EXT. | SER |
| 8830 | | 588 | INT. | SIR |

| | | | |
|---|---|---|---|
| Set 8610 | | **SET ROSCADO EXTERIOR ROSCA MÉTRICA ISO**<br>ISO Metric External Threading Set<br>Jeu taraudage extérieur filetage métrique ISO<br> | 584 |

## FRESADO - Milling - Fraisage

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8231 | New! | 598 | | SLO-03 |
| 8232 | | 599 | | A50060 |
| 8233 | New! | 600 | | SWN-09 |
| 8234 | New! | 601 | | SSD-12 |
| 8230 | | 602 | | S45SE12F -45° |
| 8235 | | 603 | | W45SE123F -45° |
| 8240 | | 604 | | S45OD06 -45° |
| 8236 | New! | 605 | | S45SN12 |
| 8241 | | 606 | | S90XN08 |
| 8245 | | 607 | | S90AP10D -90° |

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8247 | | 608 | | S90AP10D-RF -90° |
| 8250 | | 609 | | S90AP16D -90° |
| 8255 | | 610 | | W90TP16D -90° |
| 8260 | | 611 | | W90TP22D -90° |
| 8261 | New! | 612 | | SLO-03 |
| 8262 | New! | 613 | | SSD-12 |
| 8264 | | 614 | | SAP-06 |
| 8265 | | 615 | | SAP-10D |
| 8270 | | 616 | | SAP-16D |
| 8275 | | 617 | | S90SN12 |

Cont. ➜

# FRESADO - Milling - Fraisage

← Cont.

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8280 | | 618 | | SCMORD |
| 8285 | | 619 | | SRD |
| 8290 | | 620 | | SRC |
| 8295 | | 621 | | SLC |
| 8296 | New! | 622 | | CHS.. A 45º |
| 8297 | New! | 623 | | CHS |
| 8633 | | 626 | + | APHT-16-FA |
| 8636 | | 626 | + | APET-10-FA |
| 8639 | | 626 | + | APKT-10-M |
| 8642 | | 627 | + | APKT-16 |
| 8645 | | 627 | + | LC |
| 8691 | New! | 628 | - | LOGX |
| 8648 | | 628 | + | ODMT |
| 8651 | | 629 | + | RC |
| 8654 | | 629 | + | RDHT |
| 8657 | | 629 | + | RDHW |

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8693 | New! | 630 | + | SDMT |
| 8660 | | 630 | + | SEKN-12 |
| 8663 | | 631 | + | SEKR-12 |
| 8666 | | 631 | + | SEHT-12 |
| 8667 | | 632 | + | SEET-12 |
| 8669 | | 632 | + | SEHT-12 |
| 8672 | | 632 | + | SNHQ |
| 8673 | New! | 633 | - | SNMX |
| 8665 | New! | 633 | + | SPMG |
| 8675 | | 634 | + | TPKN |
| 8678 | | 634 | + | TPKR |
| 8679 | | 634 | - | XNMX |
| 8680 | | 635 | + | XOET |
| 8690 | | 635 | + | WNMW |
| 8692 | New! | 636 | - | WNMX |

## ACCESORIOS - Accessories - Accessoires

### CONOS PORTAPLAQUITAS FRESADO
Milling Tool-Holder Adaptors
Adaptateurs Porte-Plaquettes fraisage

| Ref. | | Pag. | Tipo / Type |
|---|---|---|---|
| 8200 | | 642 | DIN 69871-A-AD |
| 8201 | | 642 | JIS B 6339-BT |

### PINZAS DE SUJECIÓN PARA PORTAHERRAMIENTAS
Collets for Tool-Holders
Pinces pour les porte-outils

| Ref. | | Pag. | Clase/Class/Classe | DIN |
|---|---|---|---|---|
| 8390 New! | | 644 | P | 6499 B |
| 8391 New! | | 645 | A | 6499 B |
| 8392 New! | | 646 | A | 6499 B |
| 8395 New! | | 647 | A | |

01.

# TALADRADO METAL DURO

## Carbide Drilling

## Perçage carbure

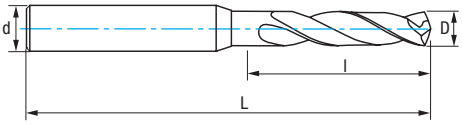
**BROCAS METAL DURO INTEGRAL**
Solid Carbide Drill Bits
Forets carbure 40

**BROCAS CENTRAR**
Center Drills
Forets à centrer 67

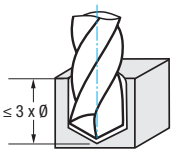
**BROCAS PUNTA METAL DURO**
Carbide Tipped Drill Bits
Forets pointe carbure 70

# Ref. 8400

## BROCA METAL DURO GRAN RENDIMIENTO CNC 3XD
## 3XD CNC High Performance Carbide Drill Bit
## Foret carbure haut rendement CNC 3XD




| MD/HM Carbure Micrograno | ALTIN | DIN 6537 K | 140° | 30° | | | DIN 6535 HA | HRC 45-55 | Tol. m7 | 3XD |
|---|---|---|---|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | ALTIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 14 | Ø 16 |
| P | P.1 | 90-110 | 0,090 | 0,140 | 0,200 | 0,240 | 0,290 | 0,300 | 0,340 |
| | P.2 | 50-80 | 0,060 | 0,090 | 0,120 | 0,140 | 0,160 | 0,200 | 0,220 |
| | P.3 | 40-70 | 0,040 | 0,050 | 0,070 | 0,090 | 0,100 | 0,140 | 0,160 |
| | P.4 | 15-30 | 0,035 | 0,050 | 0,060 | 0,062 | 0,070 | 0,075 | 0,080 |
| | P.5 | 40-70 | 0,030 | 0,050 | 0,060 | 0,062 | 0,070 | 0,075 | 0,080 |
| M | | 35-45 | 0,045 | 0,060 | 0,080 | 0,100 | 0,120 | 0,160 | 0,180 |
| K | K.1 | 40-100 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,320 |
| | K.2 | 40-60 | 0,080 | 0,120 | 0,160 | 0,200 | 0,240 | 0,260 | 0,280 |
| S | | 30-40 | 0,040 | 0,060 | 0,080 | 0,100 | 0,120 | 0,160 | 0,180 |
| N | N.1 | 50-150 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |
| | N.2 | 50-150 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |
| | N.3 | 80-300 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |
| | N.4 | 80-300 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |
| | N.5 | 60-150 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x f**

Video

# Ref. 8400

## BROCA METAL DURO GRAN RENDIMIENTO CNC 3XD
3XD CNC High Performance Carbide Drill Bit
Foret carbure haut rendement CNC 3XD

| | D mm | d mm | L mm | l mm | | N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|
| | 3,00 | 6,00 | 62 | 20 | 1 | 15819 | 36,96 |
| | 3,10 | 6,00 | 62 | 20 | 1 | 68305 | 36,96 |
| | 3,20 | 6,00 | 62 | 20 | 1 | 68306 | 36,96 |
| | 3,30 | 6,00 | 62 | 20 | 1 | 15840 | 36,96 |
| New! | 3,40 | 6,00 | 62 | 20 | 1 | 78714 | 36,96 |
| | 3,50 | 6,00 | 62 | 20 | 1 | 15841 | 36,96 |
| | 3,70 | 6,00 | 62 | 20 | 1 | 68307 | 36,96 |
| | 3,80 | 6,00 | 66 | 24 | 1 | 68376 | 36,96 |
| | 4,00 | 6,00 | 66 | 24 | 1 | 15842 | 36,96 |
| | 4,10 | 6,00 | 66 | 24 | 1 | 68378 | 36,96 |
| | 4,20 | 6,00 | 66 | 24 | 1 | 15843 | 36,96 |
| New! | 4,25 | 6,00 | 66 | 24 | 1 | 21208 | 36,96 |
| | 4,30 | 6,00 | 66 | 24 | 1 | 68381 | 36,96 |
| New! | 4,40 | 6,00 | 66 | 24 | 1 | 78718 | 36,96 |
| | 4,50 | 6,00 | 66 | 24 | 1 | 15844 | 36,96 |
| | 4,60 | 6,00 | 66 | 24 | 1 | 68382 | 36,96 |
| New! | 4,70 | 6,00 | 66 | 24 | 1 | 78721 | 36,96 |
| | 4,80 | 6,00 | 66 | 28 | 1 | 68383 | 36,96 |
| | 4,90 | 6,00 | 66 | 28 | 1 | 68384 | 36,96 |
| | 5,00 | 6,00 | 66 | 28 | 1 | 15845 | 36,96 |
| | 5,10 | 6,00 | 66 | 28 | 1 | 68385 | 36,96 |
| | 5,20 | 6,00 | 66 | 28 | 1 | 67813 | 36,96 |
| | 5,30 | 6,00 | 66 | 28 | 1 | 68386 | 36,96 |
| | 5,50 | 6,00 | 66 | 28 | 1 | 15846 | 36,96 |
| New! | 5,60 | 6,00 | 66 | 28 | 1 | 78764 | 36,96 |
| | 5,70 | 6,00 | 66 | 28 | 1 | 68387 | 36,96 |
| | 5,80 | 6,00 | 66 | 28 | 1 | 68388 | 36,96 |
| | 5,90 | 6,00 | 66 | 28 | 1 | 68389 | 36,96 |
| | 6,00 | 6,00 | 66 | 28 | 1 | 15847 | 36,96 |
| | 6,10 | 8,00 | 79 | 34 | 1 | 68390 | 41,07 |
| | 6,20 | 8,00 | 79 | 34 | 1 | 68639 | 41,07 |
| New! | 6,30 | 8,00 | 79 | 34 | 1 | 79060 | 41,07 |
| | 6,50 | 8,00 | 79 | 34 | 1 | 15848 | 41,07 |
| | 6,60 | 8,00 | 79 | 34 | 1 | 68391 | 41,07 |
| | 6,75 | 8,00 | 79 | 34 | 1 | 68392 | 41,07 |
| | 6,80 | 8,00 | 79 | 34 | 1 | 15866 | 41,07 |
| | 6,90 | 8,00 | 79 | 34 | 1 | 68393 | 41,07 |
| | 7,00 | 8,00 | 79 | 34 | 1 | 15867 | 41,07 |
| | 7,20 | 8,00 | 79 | 34 | 1 | 68394 | 41,07 |
| | 7,40 | 8,00 | 79 | 41 | 1 | 68395 | 41,07 |
| | 7,50 | 8,00 | 79 | 41 | 1 | 15869 | 41,07 |
| | 7,80 | 8,00 | 79 | 41 | 1 | 68396 | 41,07 |
| New! | 7,90 | 8,00 | 79 | 41 | 1 | 22708 | 41,07 |
| | 8,00 | 8,00 | 79 | 41 | 1 | 15870 | 41,07 |
| | 8,10 | 10,00 | 89 | 47 | 1 | 68414 | 46,06 |
| | 8,20 | 10,00 | 89 | 47 | 1 | 68415 | 46,06 |
| New! | 8,30 | 10,00 | 89 | 47 | 1 | 79061 | 46,06 |
| New! | 8,40 | 10,00 | 89 | 47 | 1 | 79062 | 46,06 |
| | 8,50 | 10,00 | 89 | 47 | 1 | 15872 | 46,06 |
| | 8,60 | 10,00 | 89 | 47 | 1 | 68416 | 46,06 |
| New! | 8,70 | 10,00 | 89 | 47 | 1 | 79063 | 46,06 |
| | 8,80 | 10,00 | 89 | 47 | 1 | 68417 | 46,06 |
| New! | 8,90 | 10,00 | 89 | 47 | 1 | 79064 | 46,06 |
| | 9,00 | 10,00 | 89 | 47 | 1 | 15873 | 46,06 |
| New! | 9,10 | 10,00 | 89 | 47 | 1 | 79065 | 46,06 |
| | 9,20 | 10,00 | 89 | 47 | 1 | 68418 | 46,06 |
| | 9,30 | 10,00 | 89 | 47 | 1 | 68419 | 46,06 |
| New! | 9,40 | 10,00 | 89 | 47 | 1 | 79066 | 46,06 |
| | 9,50 | 10,00 | 89 | 47 | 1 | 15874 | 46,06 |
| New! | 9,60 | 10,00 | 89 | 47 | 1 | 79068 | 46,06 |
| New! | 9,70 | 10,00 | 89 | 47 | 1 | 79069 | 46,06 |
| | 9,80 | 10,00 | 89 | 47 | 1 | 68420 | 46,06 |
| New! | 9,90 | 10,00 | 89 | 47 | 1 | 79079 | 46,06 |
| | 10,00 | 10,00 | 89 | 47 | 1 | 15875 | 46,06 |

| | D mm | d mm | L mm | l mm | | N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|
| | 10,10 | 12,00 | 102 | 55 | 1 | 68421 | 68,59 |
| | 10,20 | 12,00 | 102 | 55 | 1 | 15877 | 68,59 |
| | 10,30 | 12,00 | 102 | 55 | 1 | 68422 | 68,59 |
| | 10,40 | 12,00 | 102 | 55 | 1 | 68423 | 68,59 |
| | 10,50 | 12,00 | 102 | 55 | 1 | 15878 | 68,59 |
| | 10,60 | 12,00 | 102 | 55 | 1 | 68424 | 68,59 |
| New! | 10,70 | 12,00 | 102 | 55 | 1 | 79080 | 68,59 |
| | 10,80 | 12,00 | 102 | 55 | 1 | 68425 | 68,59 |
| | 11,00 | 12,00 | 102 | 55 | 1 | 15880 | 68,59 |
| New! | 11,10 | 12,00 | 102 | 55 | 1 | 79081 | 68,59 |
| | 11,20 | 12,00 | 102 | 55 | 1 | 68426 | 68,59 |
| | 11,30 | 12,00 | 102 | 55 | 1 | 68427 | 68,59 |
| | 11,50 | 12,00 | 102 | 55 | 1 | 15881 | 68,59 |
| New! | 11,70 | 12,00 | 102 | 55 | 1 | 79082 | 68,59 |
| | 11,80 | 12,00 | 102 | 55 | 1 | 68428 | 68,59 |
| | 12,00 | 12,00 | 102 | 55 | 1 | 15882 | 68,59 |
| New! | 12,10 | 14,00 | 107 | 60 | 1 | 79083 | 92,11 |
| | 12,20 | 14,00 | 107 | 60 | 1 | 68430 | 92,11 |
| | 12,30 | 14,00 | 107 | 60 | 1 | 68431 | 92,11 |
| New! | 12,40 | 14,00 | 107 | 60 | 1 | 18850 | 92,11 |
| | 12,50 | 14,00 | 107 | 60 | 1 | 68432 | 92,11 |
| New! | 12,70 | 14,00 | 107 | 60 | 1 | 79090 | 92,11 |
| | 12,80 | 14,00 | 107 | 60 | 1 | 68433 | 92,11 |
| | 13,00 | 14,00 | 107 | 60 | 1 | 15883 | 92,11 |
| New! | 13,10 | 14,00 | 107 | 60 | 1 | 79091 | 92,11 |
| | 13,30 | 14,00 | 107 | 60 | 1 | 68434 | 92,11 |
| | 13,50 | 14,00 | 107 | 60 | 1 | 68435 | 92,11 |
| New! | 13,70 | 14,00 | 107 | 60 | 1 | 79092 | 92,11 |
| | 13,80 | 14,00 | 107 | 60 | 1 | 68436 | 92,11 |
| | 14,00 | 14,00 | 107 | 60 | 1 | 15884 | 92,11 |
| | 14,20 | 16,00 | 115 | 65 | 1 | 68437 | 118,63 |
| | 14,50 | 16,00 | 115 | 65 | 1 | 68438 | 118,63 |
| New! | 14,70 | 16,00 | 115 | 65 | 1 | 79093 | 118,63 |
| | 15,00 | 16,00 | 115 | 65 | 1 | 15885 | 118,63 |
| | 15,50 | 16,00 | 115 | 65 | 1 | 68640 | 118,63 |
| | 15,70 | 16,00 | 115 | 65 | 1 | 68641 | 118,63 |
| | 16,00 | 16,00 | 115 | 65 | 1 | 15886 | 118,63 |
| | 16,50 | 18,00 | 123 | 73 | 1 | 68569 | 202,65 |
| | 17,00 | 18,00 | 123 | 73 | 1 | 68591 | 202,65 |
| | 17,50 | 18,00 | 123 | 73 | 1 | 68592 | 202,65 |
| | 18,00 | 18,00 | 123 | 73 | 1 | 68593 | 202,65 |
| | 18,50 | 20,00 | 131 | 79 | 1 | 68597 | 220,96 |
| | 19,00 | 20,00 | 131 | 79 | 1 | 68598 | 220,96 |
| | 19,50 | 20,00 | 131 | 79 | 1 | 68600 | 220,96 |
| | 20,00 | 20,00 | 131 | 79 | 1 | 68601 | 220,96 |

### Set 8 Pcs

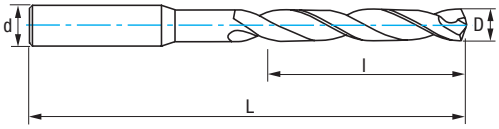
| Cont. | N° Art. ALTIN | € |
|---|---|---|
| 3-3,3<br>4-4,2<br>5-6<br>6,8-8 mm | 74791 | Set Price!<br>288,71 |

Set Price!

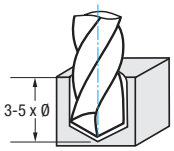
Beneficiate de un 5% de descuento extra en nuestros sets de Brocas Metal Duro
Get an extra 5% discount on our Carbide Drill Bit sets
Bénéficiez d'une remise supplémentaire de 5 % sur nos jeux de forets carbure

# Ref. 8405

## BROCA METAL DURO GRAN RENDIMIENTO CNC 5XD
5XD CNC High Performance Carbide Drill Bit
Foret carbure haut rendement CNC 5XD




**MD**/HM Carbure Micrograno | ALTIN | DIN 6537 L | 140° | 30° | DIN 6535 HA | HRC 45-55 | Tol. m7 | **5XD**




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | ALTIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 14 | Ø 16 |
| P | P.1 | 90-110 | 0,090 | 0,140 | 0,200 | 0,240 | 0,290 | 0,300 | 0,340 |
| | P.2 | 50-80 | 0,060 | 0,090 | 0,120 | 0,140 | 0,160 | 0,200 | 0,220 |
| | P.3 | 40-70 | 0,040 | 0,050 | 0,070 | 0,090 | 0,100 | 0,140 | 0,160 |
| | P.4 | 15-30 | 0,030 | 0,050 | 0,060 | 0,062 | 0,070 | 0,075 | 0,080 |
| | P.5 | 40-70 | 0,045 | 0,060 | 0,080 | 0,100 | 0,120 | 0,160 | 0,180 |
| M | | 35-45 | 0,035 | 0,050 | 0,060 | 0,062 | 0,070 | 0,075 | 0,080 |
| K | K.1 | 40-100 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,320 |
| | K.2 | 40-60 | 0,080 | 0,120 | 0,160 | 0,200 | 0,240 | 0,260 | 0,280 |
| S | | 30-40 | 0,040 | 0,060 | 0,080 | 0,100 | 0,120 | 0,160 | 0,180 |
| N | N.1 | 50-150 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |
| | N.2 | 50-150 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |
| | N.3 | 80-300 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |
| | N.4 | 80-300 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |
| | N.5 | 60-150 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x f**

# Ref. 8405

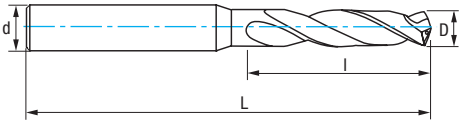
## BROCA METAL DURO GRAN RENDIMIENTO CNC 5XD
5XD CNC High Performance Carbide Drill Bit
Foret carbure haut rendement CNC 5XD

| | D mm | d mm | L mm | l mm | | N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|
| | 3,00 | 6,00 | 66 | 28 | 1 | 16156 | 43,25 |
| | 3,10 | 6,00 | 66 | 28 | 1 | 68746 | 43,25 |
| | 3,20 | 6,00 | 66 | 28 | 1 | 68747 | 43,25 |
| | 3,30 | 6,00 | 66 | 28 | 1 | 16178 | 43,25 |
| New! | 3,40 | 6,00 | 66 | 28 | 1 | 74067 | 43,25 |
| | 3,50 | 6,00 | 66 | 28 | 1 | 16202 | 43,25 |
| | 3,70 | 6,00 | 66 | 28 | 1 | 68748 | 43,25 |
| | 3,80 | 6,00 | 74 | 36 | 1 | 68749 | 43,25 |
| | 4,00 | 6,00 | 74 | 36 | 1 | 16219 | 43,25 |
| | 4,10 | 6,00 | 74 | 36 | 1 | 68750 | 43,25 |
| | 4,20 | 6,00 | 74 | 36 | 1 | 16221 | 43,25 |
| New! | 4,25 | 6,00 | 74 | 36 | 1 | 78715 | 43,25 |
| | 4,30 | 6,00 | 74 | 36 | 1 | 68751 | 43,25 |
| New! | 4,40 | 6,00 | 74 | 36 | 1 | 78719 | 43,25 |
| | 4,50 | 6,00 | 74 | 36 | 1 | 16225 | 43,25 |
| | 4,60 | 6,00 | 74 | 36 | 1 | 68752 | 43,25 |
| New! | 4,70 | 6,00 | 74 | 36 | 1 | 78722 | 43,25 |
| | 4,80 | 6,00 | 82 | 44 | 1 | 68753 | 43,25 |
| | 4,90 | 6,00 | 82 | 44 | 1 | 68754 | 43,25 |
| | 5,00 | 6,00 | 82 | 44 | 1 | 16226 | 43,25 |
| | 5,10 | 6,00 | 82 | 44 | 1 | 68756 | 43,25 |
| | 5,20 | 6,00 | 82 | 44 | 1 | 68758 | 43,25 |
| | 5,30 | 6,00 | 82 | 44 | 1 | 68759 | 43,25 |
| | 5,50 | 6,00 | 82 | 44 | 1 | 16227 | 43,25 |
| New! | 5,60 | 6,00 | 82 | 44 | 1 | 78766 | 43,25 |
| | 5,70 | 6,00 | 82 | 44 | 1 | 68760 | 43,25 |
| | 5,80 | 6,00 | 82 | 44 | 1 | 68761 | 43,25 |
| | 5,90 | 6,00 | 82 | 44 | 1 | 68762 | 43,25 |
| | 6,00 | 6,00 | 82 | 44 | 1 | 16228 | 43,25 |
| | 6,10 | 8,00 | 91 | 53 | 1 | 68763 | 51,17 |
| | 6,20 | 8,00 | 91 | 53 | 1 | 68764 | 51,17 |
| New! | 6,30 | 8,00 | 91 | 53 | 1 | 79094 | 51,17 |
| New! | 6,40 | 8,00 | 91 | 53 | 1 | 79095 | 51,17 |
| | 6,50 | 8,00 | 91 | 53 | 1 | 16229 | 51,17 |
| | 6,60 | 8,00 | 91 | 53 | 1 | 68765 | 51,17 |
| New! | 6,70 | 8,00 | 91 | 53 | 1 | 79859 | 51,17 |
| | 6,75 | 8,00 | 91 | 53 | 1 | 68766 | 51,17 |
| | 6,80 | 8,00 | 91 | 53 | 1 | 16231 | 51,17 |
| | 6,90 | 8,00 | 91 | 53 | 1 | 68767 | 51,17 |
| | 7,00 | 8,00 | 91 | 53 | 1 | 16242 | 51,17 |
| | 7,20 | 8,00 | 91 | 53 | 1 | 68769 | 51,17 |
| | 7,40 | 8,00 | 91 | 53 | 1 | 68771 | 51,17 |
| | 7,50 | 8,00 | 91 | 53 | 1 | 16252 | 51,17 |
| | 7,80 | 8,00 | 91 | 53 | 1 | 68772 | 51,17 |
| New! | 7,90 | 8,00 | 91 | 53 | 1 | 79868 | 51,17 |
| | 8,00 | 8,00 | 91 | 53 | 1 | 16254 | 51,17 |
| | 8,10 | 10,00 | 103 | 61 | 1 | 68773 | 62,74 |
| | 8,20 | 10,00 | 103 | 61 | 1 | 68774 | 62,74 |
| New! | 8,30 | 10,00 | 103 | 61 | 1 | 79893 | 62,74 |
| New! | 8,40 | 10,00 | 103 | 61 | 1 | 79894 | 62,74 |
| | 8,50 | 10,00 | 103 | 61 | 1 | 16260 | 62,74 |
| | 8,60 | 10,00 | 103 | 61 | 1 | 68775 | 62,74 |
| New! | 8,70 | 10,00 | 103 | 61 | 1 | 79897 | 62,74 |
| | 8,80 | 10,00 | 103 | 61 | 1 | 68776 | 62,74 |
| New! | 8,90 | 10,00 | 103 | 61 | 1 | 79900 | 62,74 |

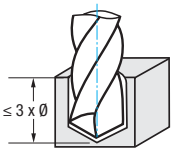
| | D mm | d mm | L mm | l mm | | N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|
| | 9,00 | 10,00 | 103 | 61 | 1 | 16276 | 62,74 |
| New! | 9,10 | 10,00 | 103 | 61 | 1 | 79903 | 62,74 |
| | 9,20 | 10,00 | 103 | 61 | 1 | 68786 | 62,74 |
| | 9,30 | 10,00 | 103 | 61 | 1 | 68787 | 62,74 |
| New! | 9,40 | 10,00 | 103 | 61 | 1 | 79906 | 62,74 |
| | 9,50 | 10,00 | 103 | 61 | 1 | 16277 | 62,74 |
| New! | 9,60 | 10,00 | 103 | 61 | 1 | 79911 | 62,74 |
| New! | 9,70 | 10,00 | 103 | 61 | 1 | 79916 | 62,74 |
| | 9,80 | 10,00 | 103 | 61 | 1 | 68788 | 62,74 |
| New! | 9,90 | 10,00 | 103 | 61 | 1 | 79970 | 62,74 |
| | 10,00 | 10,00 | 103 | 61 | 1 | 16278 | 62,74 |
| | 10,10 | 12,00 | 118 | 71 | 1 | 68792 | 91,31 |
| | 10,20 | 12,00 | 118 | 71 | 1 | 16279 | 91,31 |
| | 10,30 | 12,00 | 118 | 71 | 1 | 68796 | 91,31 |
| | 10,40 | 12,00 | 118 | 71 | 1 | 68797 | 91,31 |
| | 10,50 | 12,00 | 118 | 71 | 1 | 16280 | 91,31 |
| | 10,60 | 12,00 | 118 | 71 | 1 | 68798 | 91,31 |
| New! | 10,70 | 12,00 | 118 | 71 | 1 | 79990 | 91,31 |
| | 10,80 | 12,00 | 118 | 71 | 1 | 68799 | 91,31 |
| | 11,00 | 12,00 | 118 | 71 | 1 | 16281 | 91,31 |
| New! | 11,10 | 12,00 | 118 | 71 | 1 | 79998 | 91,31 |
| | 11,20 | 12,00 | 118 | 71 | 1 | 68801 | 91,31 |
| | 11,30 | 12,00 | 118 | 71 | 1 | 68802 | 91,31 |
| | 11,50 | 12,00 | 118 | 71 | 1 | 16282 | 91,31 |
| New! | 11,70 | 12,00 | 118 | 71 | 1 | 80010 | 91,31 |
| | 11,80 | 12,00 | 118 | 71 | 1 | 68803 | 91,31 |
| | 12,00 | 12,00 | 118 | 71 | 1 | 16300 | 91,31 |
| New! | 12,10 | 14,00 | 124 | 77 | 1 | 80025 | 120,52 |
| | 12,20 | 14,00 | 124 | 77 | 1 | 68804 | 120,52 |
| | 12,30 | 14,00 | 124 | 77 | 1 | 68805 | 120,52 |
| New! | 12,40 | 14,00 | 124 | 77 | 1 | 80030 | 120,52 |
| | 12,50 | 14,00 | 124 | 77 | 1 | 68806 | 120,52 |
| New! | 12,70 | 14,00 | 124 | 77 | 1 | 80031 | 120,52 |
| | 12,80 | 14,00 | 124 | 77 | 1 | 68808 | 120,52 |
| | 13,00 | 14,00 | 124 | 77 | 1 | 16303 | 120,52 |
| | 13,30 | 14,00 | 124 | 77 | 1 | 68809 | 120,52 |
| | 13,50 | 14,00 | 124 | 77 | 1 | 68810 | 120,52 |
| New! | 13,70 | 14,00 | 124 | 77 | 1 | 80057 | 120,52 |
| | 13,80 | 14,00 | 124 | 77 | 1 | 68812 | 120,52 |
| | 14,00 | 14,00 | 124 | 77 | 1 | 16305 | 120,52 |
| | 14,20 | 16,00 | 133 | 83 | 1 | 68813 | 152,31 |
| | 14,50 | 16,00 | 133 | 83 | 1 | 68814 | 152,31 |
| New! | 14,70 | 16,00 | 133 | 83 | 1 | 80088 | 152,31 |
| | 15,00 | 16,00 | 133 | 83 | 1 | 16308 | 152,31 |
| | 15,50 | 16,00 | 133 | 83 | 1 | 68815 | 152,31 |
| | 15,70 | 16,00 | 133 | 83 | 1 | 68816 | 152,31 |
| | 16,00 | 16,00 | 133 | 83 | 1 | 16310 | 152,31 |
| | 16,50 | 18,00 | 143 | 93 | 1 | 68834 | 226,95 |
| | 17,00 | 18,00 | 143 | 93 | 1 | 10838 | 226,95 |
| | 17,50 | 18,00 | 143 | 93 | 1 | 68836 | 226,95 |
| | 18,00 | 18,00 | 143 | 93 | 1 | 68837 | 226,95 |
| | 18,50 | 20,00 | 153 | 101 | 1 | 68839 | 247,48 |
| | 19,00 | 20,00 | 153 | 101 | 1 | 68840 | 247,48 |
| | 19,50 | 20,00 | 153 | 101 | 1 | 68842 | 247,48 |
| | 20,00 | 20,00 | 153 | 101 | 1 | 68843 | 247,48 |

# Ref. 8410

## BROCA METAL DURO REFRIGERACIÓN INTERIOR 3XD
## 3XD Internal Cooling Carbide Drill Bit
## Foret carbure lubrification interne 3XD




| **MD**/HM Carbure Grano UF | ALTIN | DIN 6537 K | 140° | 30° | | | DIN 6535 HA | HRC 45-55 | Tol. m7 | 3XD |
|---|---|---|---|---|---|---|---|---|---|---|




| Material | | Vc (m/min) * | Avances** f/rev. (mm/rev) - Feed** - Pas** | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | ALTIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 14 | Ø 16 |
| P | P.1 | 100-120 | 0,180 | 0,200 | 0,280 | 0,300 | 0,350 | 0,400 | 0,450 |
| | P.2 | 90-110 | 0,160 | 0,180 | 0,200 | 0,220 | 0,280 | 0,300 | 0,350 |
| | P.3 | 75-95 | 0,080 | 0,100 | 0,110 | 0,120 | 0,140 | 0,180 | 0,220 |
| | P.4 | 35-40 | 0,050 | 0,070 | 0,090 | 0,100 | 0,110 | 0,140 | 0,160 |
| | P.5 | 50-65 | 0,090 | 0,120 | 0,150 | 0,180 | 0,200 | 0,240 | 0,260 |
| M | | 30-40 | 0,060 | 0,060 | 0,060 | 0,080 | 0,100 | 0,120 | 0,160 |
| K | K.1 | 125-150 | 0,200 | 0,220 | 0,300 | 0,350 | 0,400 | 0,450 | 0,550 |
| | K.2 | 90-110 | 0,180 | 0,200 | 0,260 | 0,280 | 0,300 | 0,350 | 0,450 |
| S | | 35-50 | 0,060 | 0,090 | 0,090 | 0,100 | 0,140 | 0,160 | 0,180 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf = r.p.m. x f x K** **Vf (Avance mm/min Feed/Pas)**

**K =** **Coeficiente corrección segun profundidad taladrado**
**Correction coefficient depending on drilling depth**
Coéficient correction suivant la profondeur du perçage

***K para/for/pour Vc:**
< 3 x ø → K = 1
< 4 x ø → K = 0,9
< 5 x ø → K = 0,8

****K para/for/pour Vf:**
< 3 x ø → K = 1
> 3 x ø → K = 0,9

# Ref. 8410

## BROCA METAL DURO REFRIGERACIÓN INTERIOR 3XD
3XD Internal Cooling Carbide Drill Bit
Foret carbure lubrification interne 3XD

| | D mm | d mm | L mm | l mm | | N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|
| | 3,00 | 6,00 | 62 | 20 | 1 | 12950 | 55,42 |
| New! | 3,10 | 6,00 | 62 | 20 | 1 | 78712 | 55,42 |
| | 3,20 | 6,00 | 62 | 20 | 1 | 12951 | 55,42 |
| | 3,30 | 6,00 | 62 | 20 | 1 | 12952 | 55,42 |
| | 3,40 | 6,00 | 62 | 20 | 1 | 12953 | 55,42 |
| | 3,50 | 6,00 | 62 | 20 | 1 | 12954 | 55,42 |
| | 3,70 | 6,00 | 62 | 20 | 1 | 12955 | 55,42 |
| | 4,00 | 6,00 | 66 | 24 | 1 | 16315 | 55,42 |
| | 4,10 | 6,00 | 66 | 24 | 1 | 16317 | 55,42 |
| | 4,20 | 6,00 | 66 | 24 | 1 | 16319 | 55,42 |
| New! | 4,25 | 6,00 | 66 | 24 | 1 | 78716 | 55,42 |
| | 4,30 | 6,00 | 66 | 24 | 1 | 16448 | 55,42 |
| | 4,50 | 6,00 | 66 | 24 | 1 | 16559 | 55,42 |
| | 4,60 | 6,00 | 66 | 24 | 1 | 16568 | 55,42 |
| | 4,70 | 6,00 | 66 | 24 | 1 | 16588 | 55,42 |
| | 4,80 | 6,00 | 66 | 28 | 1 | 16589 | 55,42 |
| New! | 4,90 | 6,00 | 66 | 28 | 1 | 78743 | 55,42 |
| | 5,00 | 6,00 | 66 | 28 | 1 | 16601 | 55,42 |
| | 5,10 | 6,00 | 66 | 28 | 1 | 16603 | 55,42 |
| | 5,20 | 6,00 | 66 | 28 | 1 | 16604 | 55,42 |
| | 5,30 | 6,00 | 66 | 28 | 1 | 16605 | 55,42 |
| | 5,50 | 6,00 | 66 | 28 | 1 | 16607 | 55,42 |
| | 5,60 | 6,00 | 66 | 28 | 1 | 16609 | 55,42 |
| | 5,70 | 6,00 | 66 | 28 | 1 | 16616 | 55,42 |
| | 5,80 | 6,00 | 66 | 28 | 1 | 16645 | 55,42 |
| | 6,00 | 6,00 | 66 | 28 | 1 | 16671 | 55,42 |
| | 6,10 | 8,00 | 79 | 34 | 1 | 16684 | 65,70 |
| | 6,20 | 8,00 | 79 | 34 | 1 | 16698 | 65,70 |
| | 6,30 | 8,00 | 79 | 34 | 1 | 16705 | 65,70 |
| | 6,50 | 8,00 | 79 | 34 | 1 | 16732 | 65,70 |
| New! | 6,70 | 8,00 | 79 | 34 | 1 | 80094 | 65,70 |
| | 6,75 | 8,00 | 79 | 34 | 1 | 68282 | 65,70 |
| | 6,80 | 8,00 | 79 | 34 | 1 | 16742 | 65,70 |
| | 6,90 | 8,00 | 79 | 34 | 1 | 16744 | 65,70 |
| | 7,00 | 8,00 | 79 | 34 | 1 | 16745 | 65,70 |
| | 7,20 | 8,00 | 79 | 41 | 1 | 16747 | 65,70 |
| | 7,40 | 8,00 | 79 | 41 | 1 | 16750 | 65,70 |
| | 7,50 | 8,00 | 79 | 41 | 1 | 16751 | 65,70 |
| | 7,80 | 8,00 | 79 | 41 | 1 | 16756 | 65,70 |
| | 7,90 | 8,00 | 79 | 41 | 1 | 16757 | 65,70 |
| | 8,00 | 8,00 | 79 | 41 | 1 | 16759 | 65,70 |
| | 8,10 | 10,00 | 89 | 47 | 1 | 16760 | 73,71 |
| | 8,20 | 10,00 | 89 | 47 | 1 | 16762 | 73,71 |
| | 8,50 | 10,00 | 89 | 47 | 1 | 16766 | 73,71 |
| | 8,60 | 10,00 | 89 | 47 | 1 | 16767 | 73,71 |
| | 8,70 | 10,00 | 89 | 47 | 1 | 16768 | 73,71 |
| | 8,80 | 10,00 | 89 | 47 | 1 | 16769 | 73,71 |
| New! | 8,90 | 10,00 | 89 | 47 | 1 | 80124 | 73,71 |

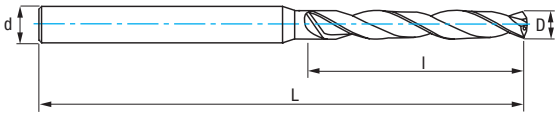
| | D mm | d mm | L mm | l mm | | N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|
| | 9,00 | 10,00 | 89 | 47 | 1 | 16772 | 73,71 |
| | 9,30 | 10,00 | 89 | 47 | 1 | 16775 | 73,71 |
| | 9,50 | 10,00 | 89 | 47 | 1 | 16778 | 73,71 |
| | 9,80 | 10,00 | 89 | 47 | 1 | 16781 | 73,71 |
| | 10,00 | 10,00 | 89 | 47 | 1 | 16807 | 73,71 |
| | 10,10 | 12,00 | 102 | 55 | 1 | 68283 | 109,74 |
| | 10,20 | 12,00 | 102 | 55 | 1 | 16822 | 109,74 |
| | 10,30 | 12,00 | 102 | 55 | 1 | 68284 | 109,74 |
| | 10,40 | 12,00 | 102 | 55 | 1 | 13022 | 109,74 |
| | 10,50 | 12,00 | 102 | 55 | 1 | 16834 | 109,74 |
| | 10,70 | 12,00 | 102 | 55 | 1 | 68285 | 109,74 |
| | 10,80 | 12,00 | 102 | 55 | 1 | 16835 | 109,74 |
| | 11,00 | 12,00 | 102 | 55 | 1 | 16836 | 109,74 |
| | 11,10 | 12,00 | 102 | 55 | 1 | 13023 | 109,74 |
| | 11,20 | 12,00 | 102 | 55 | 1 | 13028 | 109,74 |
| New! | 11,30 | 12,00 | 102 | 55 | 1 | 80322 | 109,74 |
| | 11,50 | 12,00 | 102 | 55 | 1 | 16837 | 109,74 |
| | 11,70 | 12,00 | 102 | 55 | 1 | 68286 | 109,74 |
| | 11,80 | 12,00 | 102 | 55 | 1 | 13029 | 109,74 |
| | 12,00 | 12,00 | 102 | 55 | 1 | 16838 | 109,74 |
| | 12,10 | 14,00 | 107 | 60 | 1 | 68287 | 147,38 |
| | 12,20 | 14,00 | 107 | 60 | 1 | 68288 | 147,38 |
| New! | 12,30 | 14,00 | 107 | 60 | 1 | 26405 | 147,38 |
| New! | 12,40 | 14,00 | 107 | 60 | 1 | 80327 | 147,38 |
| | 12,50 | 14,00 | 107 | 60 | 1 | 16840 | 147,38 |
| | 12,70 | 14,00 | 107 | 60 | 1 | 13031 | 147,38 |
| | 13,00 | 14,00 | 107 | 60 | 1 | 16841 | 147,38 |
| New! | 13,10 | 14,00 | 107 | 60 | 1 | 80328 | 147,38 |
| New! | 13,30 | 14,00 | 107 | 60 | 1 | 80363 | 147,38 |
| | 13,50 | 14,00 | 107 | 60 | 1 | 16842 | 147,38 |
| | 13,70 | 14,00 | 107 | 60 | 1 | 68289 | 147,38 |
| New! | 13,80 | 14,00 | 107 | 60 | 1 | 80392 | 147,38 |
| | 14,00 | 14,00 | 107 | 60 | 1 | 16844 | 147,38 |
| | 14,20 | 16,00 | 115 | 65 | 1 | 46689 | 189,79 |
| | 14,50 | 16,00 | 115 | 65 | 1 | 16848 | 189,79 |
| | 14,70 | 16,00 | 115 | 65 | 1 | 68290 | 189,79 |
| | 15,00 | 16,00 | 115 | 65 | 1 | 16849 | 189,79 |
| | 15,50 | 16,00 | 115 | 65 | 1 | 16855 | 189,79 |
| | 15,70 | 16,00 | 115 | 65 | 1 | 68291 | 189,79 |
| | 16,00 | 16,00 | 115 | 65 | 1 | 16867 | 189,79 |
| | 16,50 | 18,00 | 123 | 73 | 1 | 12960 | 303,95 |
| | 17,00 | 18,00 | 123 | 73 | 1 | 12962 | 303,95 |
| | 17,50 | 18,00 | 123 | 73 | 1 | 12963 | 303,95 |
| | 18,00 | 18,00 | 123 | 73 | 1 | 12965 | 303,95 |
| | 18,50 | 20,00 | 131 | 79 | 1 | 12968 | 331,44 |
| | 19,00 | 20,00 | 131 | 79 | 1 | 12969 | 331,44 |
| | 19,50 | 20,00 | 131 | 79 | 1 | 12970 | 331,44 |
| | 20,00 | 20,00 | 131 | 79 | 1 | 12972 | 331,44 |

**DIN 6535 HE**
**Disponible en stock** / **Available in stock** / Disponible en stock

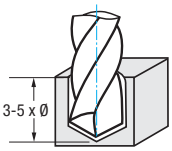
Ref. 8412

# Ref. 8415

## BROCA METAL DURO REFRIGERACIÓN INTERIOR 5XD
5XD Internal Cooling Carbide Drill Bit
Foret carbure lubrification interne 5XD




| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **MD**/HM Carbure Grano UF | ALTIN | DIN 6537 L | 140° | 30° | | | DIN 6535 HA | HRC 45-55 | Tol. m7 | 5XD |




| Material | | Vc (m/min) * | Avances** f/rev. (mm/rev) - Feed** - Pas** | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | ALTIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 14 | Ø 16 |
| P | P.1 | 100-120 | 0,180 | 0,200 | 0,280 | 0,300 | 0,350 | 0,400 | 0,450 |
| | P.2 | 90-110 | 0,160 | 0,180 | 0,200 | 0,220 | 0,280 | 0,300 | 0,350 |
| | P.3 | 75-95 | 0,080 | 0,100 | 0,110 | 0,120 | 0,140 | 0,180 | 0,220 |
| | P.4 | 35-40 | 0,050 | 0,070 | 0,090 | 0,100 | 0,110 | 0,140 | 0,160 |
| | P.5 | 50-65 | 0,090 | 0,120 | 0,150 | 0,180 | 0,200 | 0,240 | 0,260 |
| M | | 30-40 | 0,060 | 0,060 | 0,060 | 0,080 | 0,100 | 0,120 | 0,160 |
| K | K.1 | 125-150 | 0,200 | 0,220 | 0,300 | 0,350 | 0,400 | 0,450 | 0,550 |
| | K.2 | 90-110 | 0,180 | 0,200 | 0,260 | 0,280 | 0,300 | 0,350 | 0,450 |
| S | | 35-50 | 0,060 | 0,090 | 0,090 | 0,100 | 0,140 | 0,160 | 0,180 |

$$\text{r.p.m.} = \frac{\text{Vc x 1.000}}{\pi \text{ x } \varnothing}$$

**Vf = r.p.m. x f x K** **Vf (Avance mm/min Feed/Pas)**

**K =** **Coeficiente corrección segun profundidad taladrado**
**Correction coefficient depending on drilling depth**
Coéficient correction suivant la profondeur du perçage

***K para/for/**pour **Vc:**
< 3 x ø → K = 1
< 4 x ø → K = 0,9
< 5 x ø → K = 0,8

****K para/for/**pour **Vf:**
< 3 x ø → K = 1
> 3 x ø → K = 0,9

# Ref. 8415

## BROCA METAL DURO REFRIGERACIÓN INTERIOR 5XD
5XD Internal Cooling Carbide Drill Bit
Foret carbure lubrification interne 5XD

| | D mm | d mm | L mm | l mm | | N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|
| | 3,00 | 6,00 | 66 | 28 | 1 | 12973 | 59,68 |
| New! | 3,10 | 6,00 | 66 | 28 | 1 | 78713 | 59,68 |
| | 3,20 | 6,00 | 66 | 28 | 1 | 12975 | 59,68 |
| | 3,30 | 6,00 | 66 | 28 | 1 | 12978 | 59,68 |
| | 3,40 | 6,00 | 66 | 28 | 1 | 12980 | 59,68 |
| | 3,50 | 6,00 | 66 | 28 | 1 | 12981 | 59,68 |
| | 3,70 | 6,00 | 66 | 28 | 1 | 12982 | 59,68 |
| | 4,00 | 6,00 | 74 | 36 | 1 | 16876 | 64,15 |
| | 4,10 | 6,00 | 74 | 36 | 1 | 16882 | 64,15 |
| | 4,20 | 6,00 | 74 | 36 | 1 | 16891 | 64,15 |
| New! | 4,25 | 6,00 | 74 | 36 | 1 | 78717 | 64,15 |
| | 4,30 | 6,00 | 74 | 36 | 1 | 16900 | 64,15 |
| New! | 4,40 | 6,00 | 74 | 36 | 1 | 78720 | 64,15 |
| | 4,50 | 6,00 | 74 | 36 | 1 | 16915 | 64,15 |
| | 4,60 | 6,00 | 74 | 36 | 1 | 16924 | 64,15 |
| | 4,70 | 6,00 | 74 | 36 | 1 | 16933 | 64,15 |
| | 4,80 | 6,00 | 82 | 44 | 1 | 16939 | 64,15 |
| New! | 4,90 | 6,00 | 82 | 44 | 1 | 78756 | 64,15 |
| | 5,00 | 6,00 | 82 | 44 | 1 | 16945 | 64,15 |
| | 5,10 | 6,00 | 82 | 44 | 1 | 16948 | 64,15 |
| | 5,20 | 6,00 | 82 | 44 | 1 | 16951 | 64,15 |
| | 5,30 | 6,00 | 82 | 44 | 1 | 16952 | 64,15 |
| | 5,50 | 6,00 | 82 | 44 | 1 | 16957 | 64,15 |
| | 5,60 | 6,00 | 82 | 44 | 1 | 16960 | 64,15 |
| | 5,70 | 6,00 | 82 | 44 | 1 | 16961 | 64,15 |
| | 5,80 | 6,00 | 82 | 44 | 1 | 16962 | 64,15 |
| | 6,00 | 6,00 | 82 | 44 | 1 | 16968 | 64,15 |
| | 6,10 | 8,00 | 91 | 53 | 1 | 17006 | 78,83 |
| | 6,20 | 8,00 | 91 | 53 | 1 | 17021 | 78,83 |
| | 6,30 | 8,00 | 91 | 53 | 1 | 17030 | 78,83 |
| New! | 6,40 | 8,00 | 91 | 53 | 1 | 80126 | 78,83 |
| | 6,50 | 8,00 | 91 | 53 | 1 | 17039 | 78,83 |
| New! | 6,70 | 8,00 | 91 | 53 | 1 | 80129 | 78,83 |
| | 6,75 | 8,00 | 91 | 53 | 1 | 68292 | 78,83 |
| | 6,80 | 8,00 | 91 | 53 | 1 | 17091 | 78,83 |
| | 6,90 | 8,00 | 91 | 53 | 1 | 17094 | 78,83 |
| | 7,00 | 8,00 | 91 | 53 | 1 | 17104 | 78,83 |
| | 7,20 | 8,00 | 91 | 53 | 1 | 17110 | 78,83 |
| | 7,40 | 8,00 | 91 | 53 | 1 | 17111 | 78,83 |
| | 7,50 | 8,00 | 91 | 53 | 1 | 17119 | 78,83 |
| | 7,80 | 8,00 | 91 | 53 | 1 | 17143 | 78,83 |
| | 7,90 | 8,00 | 91 | 53 | 1 | 17148 | 78,83 |
| | 8,00 | 8,00 | 91 | 53 | 1 | 17149 | 78,83 |
| | 8,10 | 10,00 | 103 | 61 | 1 | 17172 | 90,22 |
| | 8,20 | 10,00 | 103 | 61 | 1 | 17227 | 90,22 |
| | 8,50 | 10,00 | 103 | 61 | 1 | 17241 | 90,22 |
| | 8,60 | 10,00 | 103 | 61 | 1 | 17254 | 90,22 |
| | 8,70 | 10,00 | 103 | 61 | 1 | 17269 | 90,22 |

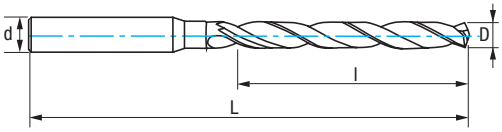
| | D mm | d mm | L mm | l mm | | N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|
| | 8,80 | 10,00 | 103 | 61 | 1 | 17275 | 90,22 |
| | 9,00 | 10,00 | 103 | 61 | 1 | 17278 | 90,22 |
| | 9,30 | 10,00 | 103 | 61 | 1 | 17295 | 90,22 |
| | 9,50 | 10,00 | 103 | 61 | 1 | 17302 | 90,22 |
| | 9,80 | 10,00 | 103 | 61 | 1 | 17308 | 90,22 |
| New! | 9,90 | 10,00 | 103 | 61 | 1 | 80130 | 90,22 |
| | 10,00 | 10,00 | 103 | 61 | 1 | 17320 | 90,22 |
| | 10,10 | 12,00 | 118 | 71 | 1 | 68293 | 131,72 |
| | 10,20 | 12,00 | 118 | 71 | 1 | 17321 | 131,72 |
| | 10,30 | 12,00 | 118 | 71 | 1 | 68294 | 131,72 |
| | 10,40 | 12,00 | 118 | 71 | 1 | 13034 | 131,72 |
| | 10,50 | 12,00 | 118 | 71 | 1 | 17323 | 131,72 |
| | 10,70 | 12,00 | 118 | 71 | 1 | 68295 | 131,72 |
| | 10,80 | 12,00 | 118 | 71 | 1 | 17324 | 131,72 |
| | 11,00 | 12,00 | 118 | 71 | 1 | 17326 | 131,72 |
| | 11,20 | 12,00 | 118 | 71 | 1 | 13037 | 131,72 |
| New! | 11,30 | 12,00 | 118 | 71 | 1 | 80133 | 131,72 |
| | 11,50 | 12,00 | 118 | 71 | 1 | 17330 | 131,72 |
| | 11,70 | 12,00 | 118 | 71 | 1 | 68296 | 131,72 |
| | 11,80 | 12,00 | 118 | 71 | 1 | 13038 | 131,72 |
| | 12,00 | 12,00 | 118 | 71 | 1 | 17336 | 131,72 |
| | 12,10 | 14,00 | 124 | 77 | 1 | 68297 | 176,92 |
| | 12,20 | 14,00 | 124 | 77 | 1 | 68298 | 176,92 |
| New! | 12,30 | 14,00 | 124 | 77 | 1 | 80136 | 176,92 |
| New! | 12,40 | 14,00 | 124 | 77 | 1 | 80137 | 176,92 |
| | 12,50 | 14,00 | 124 | 77 | 1 | 17343 | 176,92 |
| | 12,70 | 14,00 | 124 | 77 | 1 | 13040 | 176,92 |
| | 13,00 | 14,00 | 124 | 77 | 1 | 17344 | 176,92 |
| New! | 13,10 | 14,00 | 124 | 77 | 1 | 80141 | 176,92 |
| New! | 13,30 | 14,00 | 124 | 77 | 1 | 80252 | 176,92 |
| | 13,50 | 14,00 | 124 | 77 | 1 | 17346 | 176,92 |
| | 13,70 | 14,00 | 124 | 77 | 1 | 68299 | 176,92 |
| New! | 13,80 | 14,00 | 124 | 77 | 1 | 80305 | 176,92 |
| | 14,00 | 14,00 | 124 | 77 | 1 | 17357 | 176,92 |
| | 14,20 | 16,00 | 133 | 83 | 1 | 68300 | 218,33 |
| | 14,50 | 16,00 | 133 | 83 | 1 | 17365 | 218,33 |
| | 14,70 | 16,00 | 133 | 83 | 1 | 68301 | 218,33 |
| | 15,00 | 16,00 | 133 | 83 | 1 | 17371 | 218,33 |
| | 15,50 | 16,00 | 133 | 83 | 1 | 17379 | 218,33 |
| | 15,70 | 16,00 | 133 | 83 | 1 | 68302 | 218,33 |
| | 16,00 | 16,00 | 133 | 83 | 1 | 17384 | 218,33 |
| | 16,50 | 18,00 | 143 | 93 | 1 | 12984 | 349,81 |
| | 17,00 | 18,00 | 143 | 93 | 1 | 12985 | 349,81 |
| | 17,50 | 18,00 | 143 | 93 | 1 | 12986 | 349,81 |
| | 18,00 | 18,00 | 143 | 93 | 1 | 12987 | 349,81 |
| | 18,50 | 20,00 | 153 | 101 | 1 | 12988 | 380,49 |
| | 19,00 | 20,00 | 153 | 101 | 1 | 12989 | 380,49 |
| | 19,50 | 20,00 | 153 | 101 | 1 | 12990 | 380,49 |
| | 20,00 | 20,00 | 153 | 101 | 1 | 12991 | 380,49 |

**DIN 6535 HE**
**Disponible en stock** / **Available in stock** / Disponible en stock

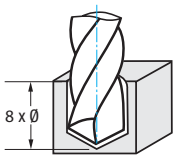
Ref. 8417

# Ref. 8411

## BROCA METAL DURO CON REFRIGERACIÓN INTERIOR 8XD
8XD Internal Coolant Carbide Drill Bit
Foret carbure lubrification interne 8XD




| MD/HM Carbure Grano UF | X-AlCr | IZAR Std. | 140° | 30° | | | HRC 45-55 | Tol. m7 | Pulido Espejo Mirror Polished Polyglass | 8XD |
|---|---|---|---|---|---|---|---|---|---|---|




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

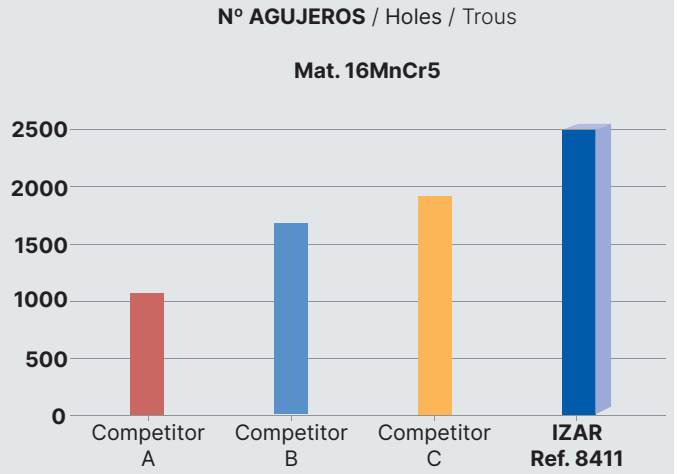
**Vf = r.p.m. x f x K** **Vf (Avance mm/min Feed/Pas)**

**K = Coeficiente corrección segun profundidad taladrado**
**Correction coefficient depending on drilling depth**
Coéficient correction suivant la profondeur du perçage

***K para/for/pour Vc:**
< 3 x ø → K = 1
< 4 x ø → K = 0,9
< 5 x ø → K = 0,8

****K para/for/pour Vf:**
< 3 x ø → K = 1
> 3 x ø → K = 0,9

| Material | | Vc (m/min) * | Avances** f/rev. (mm/rev) - Feed** - Pas** | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | X-AlCr | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 14 | Ø 16 |
| P | P.1 | 100-120 | 0,160 | 0,190 | 0,230 | 0,280 | 0,300 | 0,340 | 0,400 |
| | P.2 | 90-110 | 0,140 | 0,160 | 0,190 | 0,210 | 0,265 | 0,290 | 0,330 |
| | P.3 | 75-95 | 0,090 | 0,090 | 0,100 | 0,110 | 0,130 | 0,160 | 0,200 |
| | P.4 | 35-40 | 0,040 | 0,050 | 0,060 | 0,070 | 0,075 | 0,095 | 0,105 |
| | P.5 | 50-65 | 0,060 | 0,080 | 0,100 | 0,120 | 0,135 | 0,160 | 0,175 |
| M | | 60-70 | 0,060 | 0,060 | 0,060 | 0,080 | 0,100 | 0,120 | 0,160 |
| K | K.1 | 125-150 | 0,135 | 0,145 | 0,200 | 0,235 | 0,265 | 0,300 | 0,365 |
| | K.2 | 90-110 | 0,120 | 0,135 | 0,175 | 0,185 | 0,200 | 0,235 | 0,300 |
| S | | 35-50 | 0,040 | 0,060 | 0,060 | 0,065 | 0,095 | 0,105 | 0,120 |




**Competidores de primer nivel**
Top level competitors
Concurrents de premier rang

- **Geometría multi-material de alto rendimiento.**
- **Tratamiento superficial previo y posterior al recubrimiento para una mejor evacuación de viruta.**
- **High Performance Multi-Material Geometry.**
- **Surface Treatment –before & after coating- for a better Chipping-Off.**
- Géométrie multi-matériaux haut rendement.
- Traitement de surface - avant et après revêtement - pour une meilleure évacuation des copeaux.

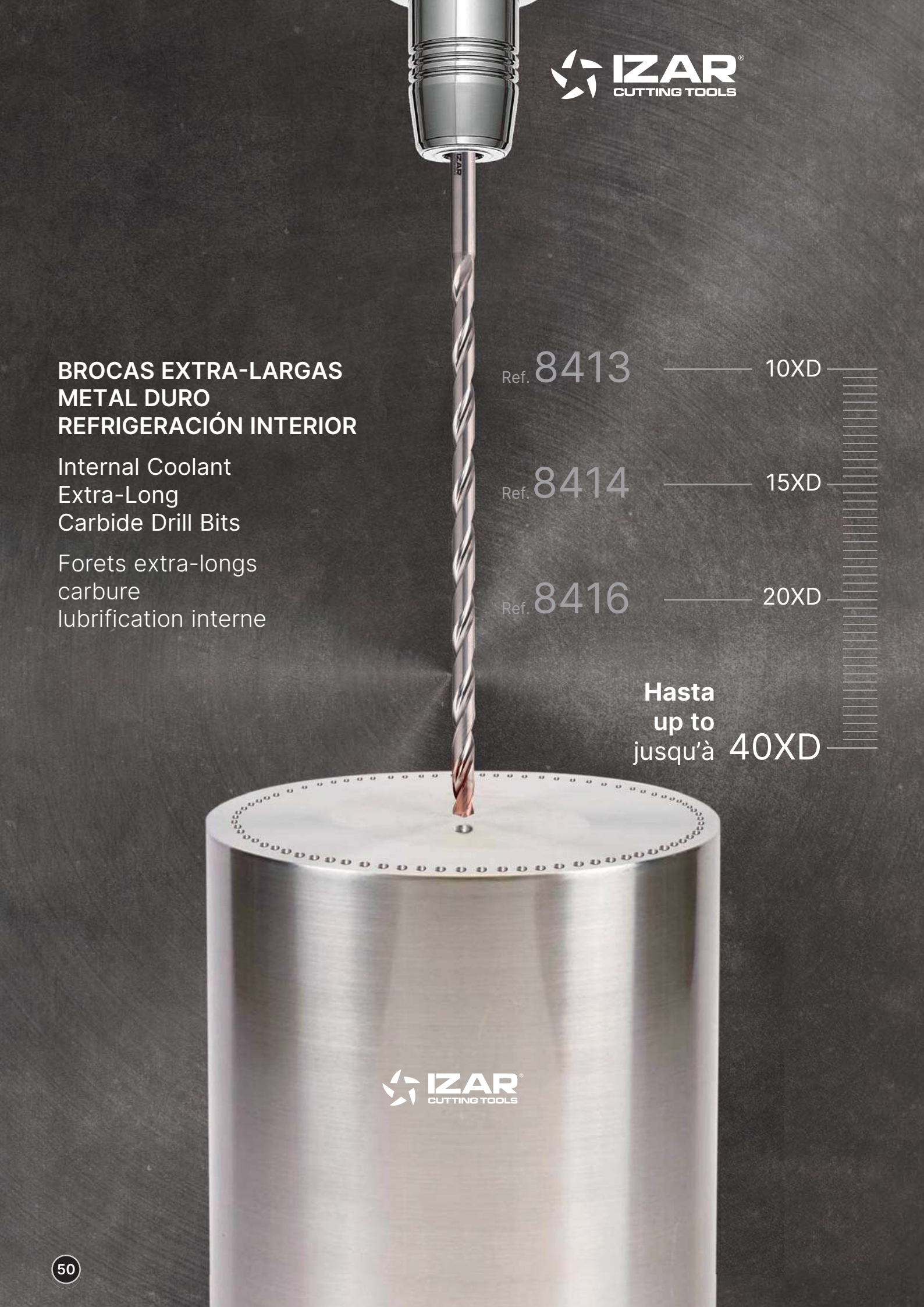
# Ref. 8411

## BROCA METAL DURO CON REFRIGERACIÓN INTERIOR 8XD
8XD Internal Coolant Carbide Drill Bit
Foret carbure lubrification interne 8XD

| D mm | d mm | L mm | l mm | | N° Art. X-AlCr | € |
|---|---|---|---|---|---|---|
| **3,00** | 6,00 | 80 | 40 | 1 | 80494 | **82,04** |
| **3,50** | 6,00 | 80 | 40 | 1 | 80496 | **82,04** |
| **4,00** | 6,00 | 80 | 40 | 1 | 79184 | **74,01** |
| **4,10** | 6,00 | 80 | 40 | 1 | 79185 | **74,01** |
| **4,20** | 6,00 | 80 | 40 | 1 | 79186 | **74,01** |
| **4,30** | 6,00 | 85 | 45 | 1 | 79187 | **74,01** |
| **4,40** | 6,00 | 85 | 45 | 1 | 79188 | **74,01** |
| **4,50** | 6,00 | 85 | 45 | 1 | 79189 | **74,01** |
| **4,60** | 6,00 | 85 | 45 | 1 | 79190 | **74,01** |
| **4,70** | 6,00 | 85 | 45 | 1 | 79191 | **74,01** |
| **4,80** | 6,00 | 90 | 50 | 1 | 79192 | **74,01** |
| **4,90** | 6,00 | 90 | 50 | 1 | 79193 | **74,01** |
| **5,00** | 6,00 | 90 | 50 | 1 | 79194 | **74,01** |
| **5,10** | 6,00 | 90 | 50 | 1 | 79195 | **74,01** |
| **5,20** | 6,00 | 90 | 50 | 1 | 79196 | **74,01** |
| **5,30** | 6,00 | 90 | 50 | 1 | 79197 | **74,01** |
| **5,40** | 6,00 | 110 | 57 | 1 | 79198 | **74,01** |
| **5,50** | 6,00 | 110 | 57 | 1 | 79199 | **74,01** |
| **5,60** | 6,00 | 110 | 57 | 1 | 79200 | **74,01** |
| **5,70** | 6,00 | 110 | 57 | 1 | 79201 | **74,01** |
| **5,80** | 6,00 | 110 | 57 | 1 | 79202 | **74,01** |
| **5,90** | 6,00 | 110 | 57 | 1 | 79203 | **74,01** |
| **6,00** | 6,00 | 110 | 57 | 1 | 79204 | **74,01** |
| **6,10** | 8,00 | 116 | 66 | 1 | 79205 | **117,01** |
| **6,20** | 8,00 | 116 | 66 | 1 | 79206 | **117,01** |
| **6,30** | 8,00 | 116 | 66 | 1 | 79207 | **117,01** |
| **6,40** | 8,00 | 116 | 66 | 1 | 79209 | **117,01** |
| **6,50** | 8,00 | 116 | 66 | 1 | 79211 | **117,01** |
| **6,60** | 8,00 | 116 | 66 | 1 | 79212 | **117,01** |
| **6,70** | 8,00 | 116 | 66 | 1 | 79213 | **117,01** |
| **6,80** | 8,00 | 116 | 66 | 1 | 79214 | **117,01** |
| **6,90** | 8,00 | 126 | 76 | 1 | 79215 | **120,39** |
| **7,00** | 8,00 | 126 | 76 | 1 | 79217 | **120,39** |
| **7,10** | 8,00 | 126 | 76 | 1 | 79218 | **120,39** |
| **7,20** | 8,00 | 126 | 76 | 1 | 79219 | **120,39** |
| **7,30** | 8,00 | 126 | 76 | 1 | 79221 | **120,39** |
| **7,40** | 8,00 | 126 | 76 | 1 | 79222 | **120,39** |
| **7,50** | 8,00 | 126 | 76 | 1 | 79223 | **120,39** |
| **7,60** | 8,00 | 126 | 76 | 1 | 79225 | **120,39** |
| **7,70** | 8,00 | 126 | 76 | 1 | 79226 | **120,39** |
| **7,80** | 8,00 | 126 | 76 | 1 | 79227 | **120,39** |
| **7,90** | 8,00 | 126 | 76 | 1 | 79228 | **120,39** |
| **8,00** | 8,00 | 126 | 76 | 1 | 79229 | **120,39** |
| **8,10** | 10,00 | 140 | 87 | 1 | 79230 | **162,82** |

| D mm | d mm | L mm | l mm | | N° Art. X-AlCr | € |
|---|---|---|---|---|---|---|
| **8,20** | 10,00 | 140 | 87 | 1 | 79231 | **162,82** |
| **8,30** | 10,00 | 140 | 87 | 1 | 79232 | **162,82** |
| **8,40** | 10,00 | 140 | 87 | 1 | 79233 | **162,82** |
| **8,50** | 10,00 | 140 | 87 | 1 | 79234 | **162,82** |
| **8,60** | 10,00 | 140 | 87 | 1 | 79235 | **162,82** |
| **8,70** | 10,00 | 140 | 87 | 1 | 79236 | **162,82** |
| **8,80** | 10,00 | 140 | 87 | 1 | 79237 | **162,82** |
| **8,90** | 10,00 | 140 | 87 | 1 | 79238 | **162,82** |
| **9,00** | 10,00 | 145 | 95 | 1 | 79239 | **162,82** |
| **9,10** | 10,00 | 145 | 95 | 1 | 79240 | **162,82** |
| **9,20** | 10,00 | 145 | 95 | 1 | 79241 | **162,82** |
| **9,30** | 10,00 | 145 | 95 | 1 | 79242 | **162,82** |
| **9,40** | 10,00 | 145 | 95 | 1 | 79244 | **162,82** |
| **9,50** | 10,00 | 145 | 95 | 1 | 79246 | **162,82** |
| **9,60** | 10,00 | 145 | 95 | 1 | 79248 | **162,82** |
| **9,70** | 10,00 | 145 | 95 | 1 | 79249 | **162,82** |
| **9,80** | 10,00 | 145 | 95 | 1 | 79250 | **162,82** |
| **9,90** | 10,00 | 145 | 95 | 1 | 79251 | **162,82** |
| **10,00** | 10,00 | 145 | 95 | 1 | 79252 | **162,82** |
| **10,20** | 12,00 | 160 | 106 | 1 | 79253 | **208,28** |
| **10,30** | 12,00 | 160 | 106 | 1 | 79254 | **208,28** |
| **10,50** | 12,00 | 160 | 106 | 1 | 79255 | **208,28** |
| **10,80** | 12,00 | 160 | 106 | 1 | 79260 | **208,28** |
| **11,00** | 12,00 | 160 | 106 | 1 | 79261 | **208,28** |
| **11,20** | 12,00 | 165 | 114 | 1 | 79262 | **208,28** |
| **11,50** | 12,00 | 165 | 114 | 1 | 79263 | **208,28** |
| **11,80** | 12,00 | 165 | 114 | 1 | 79264 | **208,28** |
| **12,00** | 12,00 | 165 | 114 | 1 | 79265 | **208,28** |
| ***12,10** | 14,00 | 185 | 135 | 1 | 79269 | |
| ***12,20** | 14,00 | 185 | 133 | 1 | 79270 | |
| ***12,30** | 14,00 | 185 | 133 | 1 | 79272 | |
| ***12,50** | 14,00 | 185 | 133 | 1 | 79273 | |
| ***12,70** | 14,00 | 185 | 133 | 1 | 79274 | |
| **13,00** | 14,00 | 185 | 133 | 1 | 79275 | **289,69** |
| ***13,50** | 14,00 | 185 | 133 | 1 | 79276 | |
| ***14,00** | 14,00 | 185 | 133 | 1 | 79277 | |
| ***14,10** | 16,00 | 205 | 152 | 1 | 79278 | |
| ***14,20** | 16,00 | 205 | 152 | 1 | 79279 | |
| ***14,50** | 16,00 | 205 | 152 | 1 | 79280 | |
| ***15,00** | 16,00 | 205 | 152 | 1 | 79281 | |
| ***15,50** | 16,00 | 205 | 152 | 1 | 79282 | |
| ***16,00** | 16,00 | 205 | 152 | 1 | 79283 | |

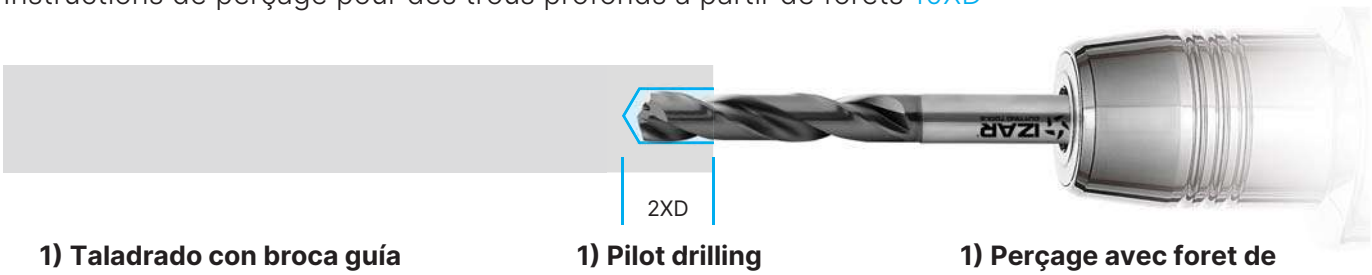
*** Diam. bajo demanda** / **upon request** / sur demande


IZAR
CUTTING TOOLS
BROCAS EXTRA-LARGAS
METAL DURO
REFRIGERACIÓN INTERIOR
Internal Coolant
Extra-Long
Carbide Drill Bits
Forets extra-longs
carbure
lubrification interne
Ref. 8413
10XD
Ref. 8414
15XD
Ref. 8416
20XD
Hasta
up to
jusqu'à
40XD
IZAR
CUTTING TOOLS

# INSTRUCCIONES DE TALADRADO PARA AGUJEROS PROFUNDOS A PARTIR DE BROCAS 10XD

Deep Hole Drilling Instructions for 10XD drill bits and above

Instructions de perçage pour des trous profonds à partir de forets 10XD




## 1) Taladrado con broca guía

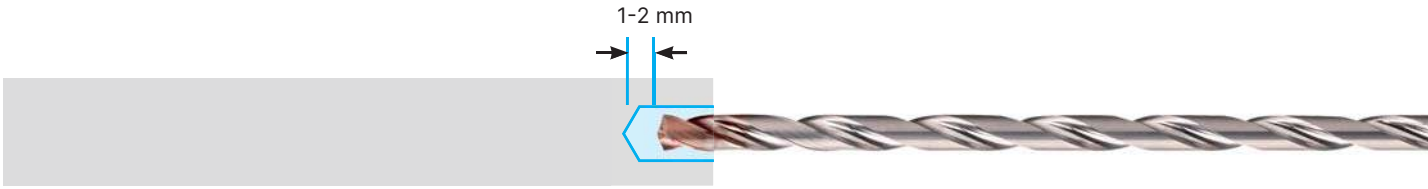
**Utilizamos una broca corta, por ejemplo de longitud 3XD, con refrigeración (refrigeración interior o exterior, dependiendo del tipo de broca guía que usemos). Esta broca debe tener el mismo ángulo de punta que la broca larga que usaremos después.**

## 1) Pilot drilling

Pilot drilling with a short drill bit (3XD) with coolant (internal or external). The point angle should be the same as in the long drill bit on the step 2.

## 1) Perçage avec foret de guidage

Nous utilisons un foret court, par exemple de longueur 3XD, avec refroidissement (refroidissement interne ou externe, selon le type de foret de guidage que nous utilisons). Ce foret doit avoir le même angle de pointe que le foret long que nous utiliserons après.




## 2) Introducir la broca larga en el agujero guía

**Introducir cuidadosamente la broca sin refrigeración a 300 rpm y con vf: 1000 mm/min.**

**Justo antes de llegar al fondo del agujero guía (1-2 mm), parar el avance y activar la refrigeración.**

## 2) Insert the long drill into the pilot drill hole

Insert the long drill carefully and without any coolant at 300 rpm and vf: 1000 mm/min. Just before reaching the bottom of the hole (1-2 mm), stop the feed and start adding the coolant.

## 2) Insérer le foret long dans le trou de guidage

Insérer avec précaution le foret non refroidi à 300 rpm avec vf: 1000 mm/min.

Juste avant d'atteindre le fond du trou de guidage (1-2 mm), arrêter l'avance et activer le refroidissement.

## 3) Punteado

**Ajustar las Vc y Vf a 50% hasta llegar a una profundidad aproximada de 3XD.**

## 3) Spot drilling

Reduce Vc and Vf to 50% of the final value. Hole depth: 3XD aprox.

## 3) Pointillage

Ajuster la Vc et la Vf à 50 % jusqu'à atteindre une profondeur d'environ 3XD.

## 4) Taladrado profundo

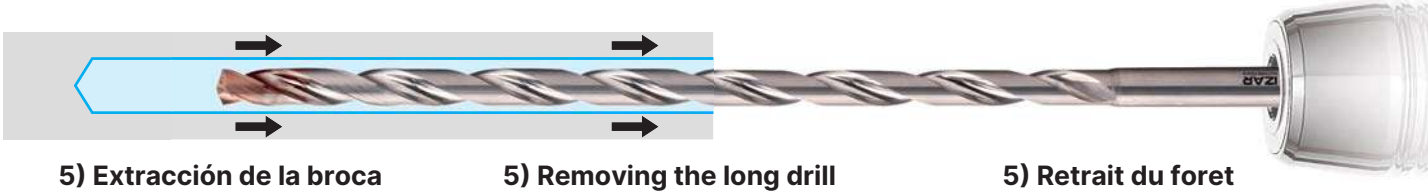
**Ajustar las Vc y Vf a los valores finales (100%) y sin ralentizar en ningún momento.**

## 4) Deep hole drilling

Adjust Vc and Vf at 100%. Don´t reduce the speed in the whole process.

## 4) Perçage profond

Ajuster les Vc et Vf aux valeurs finales (100%) et sans ralentir à aucun moment.



## 5) Extracción de la broca

**Antes de extraer la broca, volvemos a reducir a Vc: 300 rpm y a vf: 500 mm/min. Sin refrigeración.**

## 5) Removing the long drill

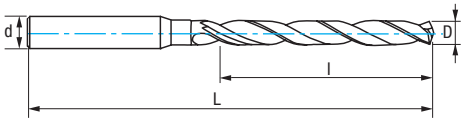
After reaching the hole depth, reduce the Vc to 300 rmp and vf: 500 mm/min. Don´t use any coolant during this process.

## 5) Retrait du foret

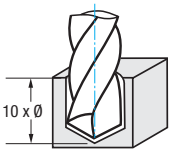
Avant de retirer le foret, nous le réduisons à Vc: 300 rpm et vf: 500 mm/min. Pas de refroidissement.

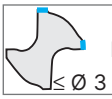
# Ref. 8413

## BROCA METAL DURO CON REFRIGERACIÓN INTERIOR 10XD
10XD Internal Coolant Carbide Drill Bit
Foret carbure lubrification interne 10XD




**MD**/HM Carbure Grano UF | X-AlCr | IZAR Std. | 140° | 30° | HRC 45-55 | Tol. m7 | **Pulido Espejo** Mirror Polished Polyglass | **10XD**




**Faceta doble** Double Margin Listel double

| Material | | Vc (m/min) * | Avances** f/rev. (mm/rev) - Feed** - Pas** | | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | X-AlCr | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| P | P.1 | 90-100 | 0,130 | 0,170 | 0,240 | 0,260 | 0,280 |
| | P.2 | 70-80 | 0,100 | 0,125 | 0,170 | 0,190 | 0,240 |
| | P.3 | 60-70 | 0,070 | 0,080 | 0,090 | 0,100 | 0,120 |
| M | | 45-60 | 0,040 | 0,040 | 0,040 | 0,055 | 0,065 |
| K | K.1 | 60-70 | 0,110 | 0,180 | 0,240 | 0,280 | 0,300 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf = r.p.m. x f x K** **Vf (Avance mm/min Feed/Pas)**

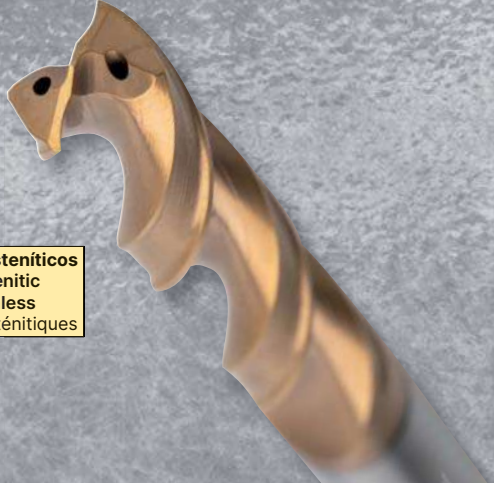
**K = Coeficiente corrección segun profundidad taladrado**
**Correction coefficient depending on drilling depth**
Coéficient correction suivant la profondeur du perçage

***K para/for/pour Vc:**
< 3 x ø → K = 1
< 4 x ø → K = 0,9
< 5 x ø → K = 0,8

****K para/for/pour Vf:**
< 3 x ø → K = 1
> 3 x ø → K = 0,9

| D mm | d mm | L mm | l mm | | N° Art. X-AlCr | € |
|---|---|---|---|---|---|---|
| **3,00** | 4,00 | 100 | 48 | 1 | 79284 | **95,72** |
| **3,50** | 4,00 | 100 | 48 | 1 | 79288 | **95,72** |
| **4,00** | 4,00 | 100 | 48 | 1 | 79289 | **95,72** |
| **4,50** | 6,00 | 125 | 72 | 1 | 79291 | **153,16** |
| **5,00** | 6,00 | 125 | 72 | 1 | 79292 | **153,16** |
| **5,50** | 6,00 | 125 | 72 | 1 | 79293 | **153,16** |
| **6,00** | 6,00 | 125 | 72 | 1 | 79294 | **153,16** |
| **6,50** | 8,00 | 150 | 96 | 1 | 79295 | **248,88** |
| **7,00** | 8,00 | 150 | 96 | 1 | 79296 | **248,88** |
| **7,50** | 8,00 | 150 | 96 | 1 | 79297 | **248,88** |
| **8,00** | 8,00 | 150 | 96 | 1 | 79298 | **248,88** |
| **8,50** | 10,00 | 175 | 120 | 1 | 79299 | **371,40** |
| **9,00** | 10,00 | 175 | 120 | 1 | 79300 | **371,40** |
| **9,50** | 10,00 | 175 | 120 | 1 | 79302 | **371,40** |
| **10,00** | 10,00 | 175 | 120 | 1 | 79304 | **371,40** |
| **11,00** | 12,00 | 200 | 132 | 1 | 79305 | **544,64** |
| **12,00** | 12,00 | 200 | 144 | 1 | 79308 | **544,64** |

- **Geometrías especiales y otras medidas bajo demanda**
- **Special geometries and other sizes upon request**
- Géométries spéciales et autres tailles sur demande

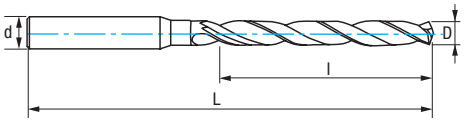


**P** Aceros Steels Aciers

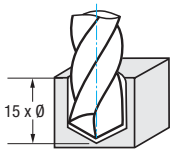
**M** INOX Austeníticos Austenitic Stainless INOX Austénitiques

# Ref. 8414

## BROCA METAL DURO CON REFRIGERACIÓN INTERIOR 15XD
15XD Internal Coolant Carbide Drill Bit
Foret carbure lubrification interne 15XD




| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **MD**/HM Carbure Grano UF | X-AlCr | IZAR Std. | 140° | 30° | | | HRC 45-55 | Tol. m7 | **Pulido Espejo** Mirror Polished Polyglass | **15XD** |



**Faceta doble**
Double Margin
Listel double

| Material | | Vc (m/min) * | Avances** f/rev. (mm/rev) - Feed** - Pas** | | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | X-AlCr | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| P | P.1 | 90-100 | 0,130 | 0,170 | 0,240 | 0,260 | 0,280 |
| | P.2 | 70-80 | 0,100 | 0,125 | 0,170 | 0,190 | 0,240 |
| | P.3 | 60-70 | 0,070 | 0,080 | 0,090 | 0,100 | 0,120 |
| M | | 45-60 | 0,040 | 0,040 | 0,040 | 0,055 | 0,065 |
| K | K.1 | 60-70 | 0,110 | 0,180 | 0,240 | 0,280 | 0,300 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf = r.p.m. x f x K** **Vf (Avance mm/min Feed/Pas)**

**K = Coeficiente corrección segun profundidad taladrado**
**Correction coefficient depending on drilling depth**
Coéficient correction suivant la profondeur du perçage

***K para/for/pour Vc:**
< 3 x ø → K = 1
< 4 x ø → K = 0,9
< 5 x ø → K = 0,8

****K para/for/pour Vf:**
< 3 x ø → K = 1
> 3 x ø → K = 0,9

| D mm | d mm | L mm | l mm | | N° Art. X-AlCr | € |
|---|---|---|---|---|---|---|
| **3,00** | 3,00 | 95 | 55 | 1 | 79310 | **119,66** |
| **3,50** | 4,00 | 115 | 76 | 1 | 79311 | **124,44** |
| **4,00** | 4,00 | 115 | 76 | 1 | 79312 | **124,44** |
| **4,50** | 6,00 | 133 | 93 | 1 | 79313 | **182,83** |
| **5,00** | 6,00 | 133 | 93 | 1 | 79314 | **182,83** |
| **5,50** | 6,00 | 150 | 110 | 1 | 79315 | **210,58** |
| **6,00** | 6,00 | 150 | 110 | 1 | 79316 | **210,58** |
| **6,50** | 8,00 | 167 | 127 | 1 | 79317 | **312,05** |
| **7,00** | 8,00 | 167 | 127 | 1 | 79319 | **312,05** |
| **7,50** | 8,00 | 183 | 143 | 1 | 79320 | **330,24** |
| **8,00** | 8,00 | 183 | 143 | 1 | 79322 | **330,24** |
| **8,50** | 10,00 | 204 | 160 | 1 | 79323 | **428,36** |
| **9,00** | 10,00 | 204 | 160 | 1 | 79325 | **428,36** |
| **9,50** | 10,00 | 221 | 177 | 1 | 79326 | **457,07** |
| **10,00** | 10,00 | 221 | 177 | 1 | 79327 | **457,07** |
| **11,00** | 12,00 | 247 | 198 | 1 | 79328 | **758,10** |
| **12,00** | 12,00 | 263 | 214 | 1 | 79329 | **775,33** |

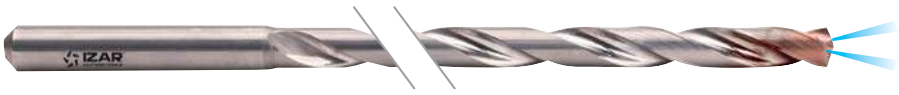
- **Geometrías especiales y otras medidas bajo demanda**
- **Special geometries and other sizes upon request**
- Géométries spéciales et autres tailles sur demande

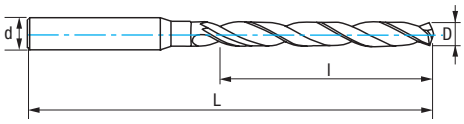
**S** **Aleaciones Termorresistentes (Titanio, Inconel...)**
**Heat-Resistant Alloys (Titanium, Inconel...)**
Alliages thermorésistants (Titane, Inconel...)

**N** **Aluminio**
**Aluminium**

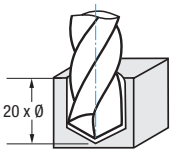
# Ref. 8416

## BROCA METAL DURO CON REFRIGERACIÓN INTERIOR 20XD
20XD Internal Coolant Carbide Drill Bit
Foret carbure lubrification interne 20XD






| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **MD**/HM Carbure Grano UF | X-AlCr | IZAR Std. | 140° | 30° | | | HRC 45-55 | Tol. m7 | **Pulido Espejo** Mirror Polished Polyglass | **20XD** |



**Faceta doble** Double Margin Listel double
≤ Ø 3

| Material | | Vc (m/min) * | Avances** f/rev. (mm/rev) - Feed** - Pas** | | | |
|---|---|---|---|---|---|---|
| Grupo | Sub. | X-AlCr | Ø 4 | Ø 6 | Ø 8 | Ø 10 |
| P | P.1 | 90-100 | 0,130 | 0,170 | 0,240 | 0,260 |
| | P.2 | 70-80 | 0,100 | 0,125 | 0,170 | 0,190 |
| | P.3 | 60-70 | 0,070 | 0,080 | 0,090 | 0,100 |
| M | | 45-60 | 0,040 | 0,040 | 0,040 | 0,055 |
| K | K.1 | 60-70 | 0,110 | 0,180 | 0,240 | 0,280 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

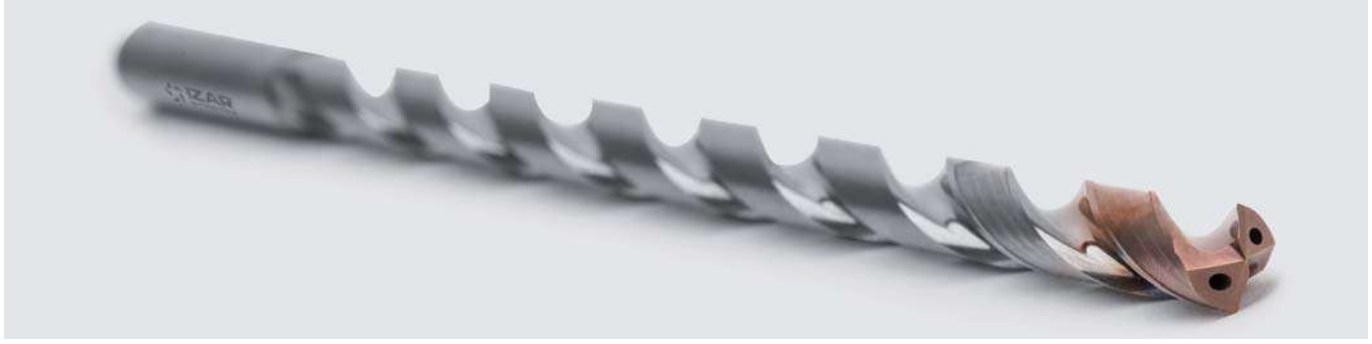
**Vf = r.p.m. x f x K** **Vf (Avance mm/min Feed/Pas)**

**K = Coeficiente corrección segun profundidad taladrado**
**Correction coefficient depending on drilling depth**
Coéficient correction suivant la profondeur du perçage

***K para/for/pour Vc:**
< 3 x ø → K = 1
< 4 x ø → K = 0,9
< 5 x ø → K = 0,8

****K para/for/pour Vf:**
< 3 x ø → K = 1
> 3 x ø → K = 0,9

| D mm | d mm | L mm | l mm | | N° Art. X-AlCr | € |
|---|---|---|---|---|---|---|
| **3,00** | 3,00 | 110 | 70 | 1 | 79330 | **143,57** |
| **3,50** | 4,00 | 123 | 83 | 1 | 79331 | **155,56** |
| **4,00** | 4,00 | 136 | 96 | 1 | 79332 | **155,56** |
| **4,50** | 6,00 | 158 | 118 | 1 | 79333 | **219,39** |
| **5,00** | 6,00 | 158 | 118 | 1 | 79334 | **219,39** |
| **5,10** | 6,00 | 158 | 118 | 1 | 83096 | **252,70** |
| **5,50** | 6,00 | 180 | 140 | 1 | 79335 | **252,70** |
| **6,00** | 6,00 | 180 | 140 | 1 | 79336 | **252,70** |
| **6,50** | 8,00 | 202 | 162 | 1 | 79337 | **374,43** |
| **7,00** | 8,00 | 202 | 162 | 1 | 79338 | **374,43** |
| **7,50** | 8,00 | 223 | 183 | 1 | 79339 | **396,28** |
| **8,00** | 8,00 | 223 | 183 | 1 | 79340 | **396,28** |
| **8,50** | 10,00 | 249 | 205 | 1 | 79341 | **514,02** |
| **9,00** | 10,00 | 249 | 205 | 1 | 79342 | **514,02** |
| **9,50** | 10,00 | 271 | 227 | 1 | 79343 | **786,65** |
| **10,00** | 10,00 | 271 | 227 | 1 | 79344 | **786,65** |

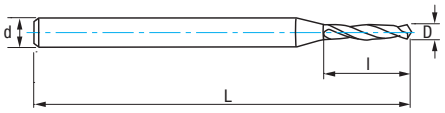


Amélioration continue du contrôle qualité

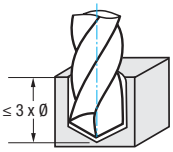
izartool.com/fr

# Ref. 8401

## MICRO BROCA METAL DURO GRAN RENDIMIENTO CNC 3XD
## 3XD CNC High Performance Carbide Micro Drill Bit
## Micro foret carbure haut rendement CNC 3XD




| MD/HM Carbure Grano UF | TIALCN | IZAR Std. | 130° | 30° | | | HRC 45-55 | Tol. h8 | Pulido Espejo Mirror Polished Polyglass | 3XD |
|---|---|---|---|---|---|---|---|---|---|---|




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas |
|---|---|---|---|
| Grupo | Sub. | TIALCN | Diam. 0,2-2,9 |
| P | P.1 | 28-48 | 0,080-0,160 |
| | P.2 | 24-45 | 0,070-0,160 |
| | P.3 | 20-40 | 0,065-0,145 |
| | P.5 | 24-40 | 0,070-0,145 |
| M | | 16-32 | 0,048-0,120 |
| K | K.1 | 32-48 | 0,080-0,160 |
| | K.2 | 28-44 | 0,080-0,160 |

| | D mm | d mm | L mm | l mm | | N° Art. TIALCN | € |
|---|---|---|---|---|---|---|---|
| | 0,20 | 3,00 | 38 | 3 | 1 | 77262 | 18,48 |
| | 0,30 | 3,00 | 38 | 3 | 1 | 77264 | 18,48 |
| | 0,40 | 3,00 | 38 | 3 | 1 | 77265 | 18,48 |
| | 0,50 | 3,00 | 38 | 3 | 1 | 77266 | 18,48 |
| | 0,60 | 3,00 | 38 | 3 | 1 | 77267 | 17,79 |
| | 0,70 | 3,00 | 38 | 3 | 1 | 77268 | 17,79 |
| | 0,80 | 3,00 | 38 | 4 | 1 | 77270 | 17,79 |
| | 0,90 | 3,00 | 38 | 4 | 1 | 77273 | 17,79 |
| | 1,00 | 3,00 | 38 | 4 | 1 | 77275 | 17,10 |
| | 1,10 | 3,00 | 38 | 6 | 1 | 77277 | 17,10 |
| | 1,20 | 3,00 | 38 | 6 | 1 | 77279 | 17,10 |
| | 1,30 | 3,00 | 38 | 6 | 1 | 77280 | 17,10 |
| New! | 1,35 | 3,00 | 38 | 6 | 1 | 20038 | 19,32 |
| | 1,40 | 3,00 | 38 | 6 | 1 | 77281 | 17,10 |
| | 1,50 | 3,00 | 38 | 6 | 1 | 77286 | 17,10 |

| D mm | d mm | L mm | l mm | | N° Art. TIALCN | € |
|---|---|---|---|---|---|---|
| 1,60 | 3,00 | 38 | 8 | 1 | 77287 | 17,10 |
| 1,70 | 3,00 | 38 | 8 | 1 | 77288 | 17,10 |
| 1,80 | 3,00 | 38 | 8 | 1 | 77289 | 17,10 |
| 1,90 | 3,00 | 38 | 8 | 1 | 77292 | 17,10 |
| 2,00 | 3,00 | 38 | 8 | 1 | 77293 | 17,10 |
| 2,10 | 3,00 | 38 | 8 | 1 | 77301 | 19,32 |
| 2,20 | 3,00 | 38 | 8 | 1 | 77324 | 19,32 |
| 2,30 | 3,00 | 38 | 8 | 1 | 77325 | 19,32 |
| 2,40 | 3,00 | 38 | 8 | 1 | 77326 | 19,32 |
| 2,50 | 3,00 | 38 | 8 | 1 | 77327 | 19,32 |
| 2,60 | 3,00 | 38 | 8 | 1 | 77328 | 19,32 |
| 2,70 | 3,00 | 38 | 8 | 1 | 77329 | 19,32 |
| 2,80 | 3,00 | 38 | 8 | 1 | 77330 | 19,32 |
| 2,90 | 3,00 | 38 | 8 | 1 | 77331 | 19,32 |

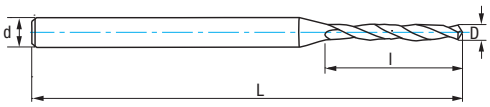
- **Aguzado de gran precisión.**
- **Geometría especial para alto rendimiento en aceros aleados y fundición.**
- **Gran acabado superficial del canal para una excelente evacuación de viruta.**
- **High precision Split Point.**
- **Special geometry for higher performance in Alloyed Steels and die Cast Iron.**
- **Polished coating surface for an excellent chip removal.**
- Affûtage précision.
- Géométrie spéciale pour haute performance dans aciers alliés et fonte.
- Grand finition superficiel de goujure pour une excellente évacuation des copeaux.

Video

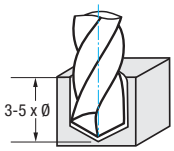
# Ref. 8402

## MICRO BROCA METAL DURO GRAN RENDIMIENTO CNC 5XD
5XD CNC High Performance Carbide Micro Drill Bit
Micro foret carbure haut rendement CNC 5XD

New!




| **MD**/HM Carbure Grano UF | TIALCN | IZAR Std. | 130° | 30° | | | HRC 45-55 | Tol. h8 | **Pulido Espejo** Mirror Polished Polyglass | 5XD |
|---|---|---|---|---|---|---|---|---|---|---|




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

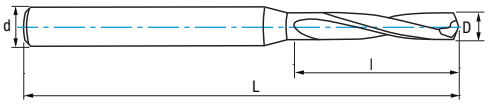
| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas |
|---|---|---|---|
| Grupo | Sub. | TIALCN | Diam. 1,0-2,9 |
| P | P.1 | 28-48 | 0,080-0,160 |
| | P.2 | 24-45 | 0,070-0,160 |
| | P.3 | 20-40 | 0,065-0,145 |
| | P.5 | 24-40 | 0,070-0,145 |
| M | | 16-32 | 0,048-0,120 |
| K | K.1 | 32-48 | 0,080-0,160 |
| | K.2 | 28-44 | 0,080-0,160 |

| D mm | d mm | L mm | l mm | | N° Art. TIALCN | € |
|---|---|---|---|---|---|---|
| **1,00** | 3,00 | 50 | 8 | 1 | 69992 | **19,42** |
| **1,10** | 3,00 | 50 | 8 | 1 | 70004 | **19,42** |
| **1,20** | 3,00 | 50 | 8 | 1 | 70007 | **19,42** |
| **1,30** | 3,00 | 50 | 8 | 1 | 70031 | **19,42** |
| **1,40** | 3,00 | 50 | 9 | 1 | 70034 | **19,42** |
| **1,50** | 3,00 | 50 | 9 | 1 | 70037 | **19,42** |
| **1,60** | 3,00 | 50 | 10 | 1 | 70040 | **19,42** |
| **1,70** | 3,00 | 50 | 10 | 1 | 70043 | **19,42** |
| **1,80** | 3,00 | 50 | 12 | 1 | 70046 | **19,42** |
| **1,90** | 3,00 | 50 | 12 | 1 | 70055 | **19,42** |

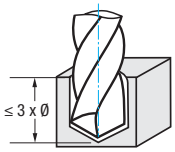
| D mm | d mm | L mm | l mm | | N° Art. TIALCN | € |
|---|---|---|---|---|---|---|
| **2,00** | 3,00 | 50 | 12 | 1 | 70058 | **19,42** |
| **2,10** | 3,00 | 50 | 12 | 1 | 70061 | **21,95** |
| **2,20** | 3,00 | 50 | 13 | 1 | 70064 | **21,95** |
| **2,30** | 3,00 | 50 | 13 | 1 | 70067 | **21,95** |
| **2,40** | 3,00 | 50 | 14 | 1 | 70070 | **21,95** |
| **2,50** | 3,00 | 50 | 14 | 1 | 70073 | **21,95** |
| **2,60** | 3,00 | 50 | 14 | 1 | 70076 | **21,95** |
| **2,70** | 3,00 | 50 | 16 | 1 | 70079 | **21,95** |
| **2,80** | 3,00 | 50 | 16 | 1 | 70082 | **21,95** |
| **2,90** | 3,00 | 50 | 16 | 1 | 70085 | **21,95** |

# Ref. 8403

## BROCA METAL DURO MATERIALES TEMPLADOS 60 HRC
60 HRC Hardened Materials Solid Carbide Drill Bit
Foret carbure matériaux trempés 60 HRC




| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **MD**/HM Carbure Grano UF | SUA | IZAR Std. | 140° | 12-20° | | | HRC 45-60 | Tol. h8 | 3XD | **Faceta doble** Double Margin Listel double ≤ Ø 3 |




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | SUA | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| P | P.4 | 15-30 | 0,015 | 0,035 | 0,050 | 0,060 | 0,062 | 0,070 |
| S | 38-45 HRC | 15-30 | 0,030 | 0,060 | 0,080 | 0,100 | 0,150 | 0,180 |
| H | 40-45 HRC | 30-50 | 0,030 | 0,060 | 0,080 | 0,100 | 0,150 | 0,180 |
| | 45-50 HRC | 20-30 | 0,030 | 0,060 | 0,080 | 0,100 | 0,150 | 0,180 |
| | 50-60 HRC | 20-30 | 0,020 | 0,040 | 0,060 | 0,080 | 0,100 | 0,140 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x f**

- **Brocas especialmente diseñadas para taladrar aleaciones termoresistentes y aceros endurecidos.**
- **Geometría de punta con filo protegido.**
- **Mango reforzado.**

- **Specially designed for heat-resistant alloys and hardened steels.**
- **Optimized drill point geometry which provides an excellent wear protection of the edges.**
- **Reinforced shank.**

- Forets spécialement conçus pour percer des alliages thermorésistants et des aciers supérieurs.
- Géométrie de la pointe avec arête protégée.
- Queue renforcée.

# Ref. 8403

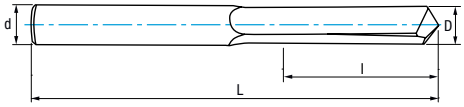
## BROCA METAL DURO MATERIALES TEMPLADOS 60 HRC
60 HRC Hardened Materials Solid Carbide Drill Bit
Foret carbure matériaux trempés 60 HRC

| D mm | d mm | L mm | l mm | | N° Art. SUA | € |
|---|---|---|---|---|---|---|
| **0,90** | 3,00 | 50 | 8 | 1 | 53801 | **26,17** |
| **0,95** | 3,00 | 50 | 8 | 1 | 53802 | **26,17** |
| **1,00** | 3,00 | 50 | 8 | 1 | 53804 | **26,17** |
| **1,10** | 3,00 | 50 | 8 | 1 | 53805 | **26,17** |
| **1,20** | 3,00 | 50 | 8 | 1 | 53810 | **26,17** |
| **1,25** | 3,00 | 50 | 8 | 1 | 53811 | **26,17** |
| **1,30** | 3,00 | 50 | 10 | 1 | 53814 | **26,17** |
| **1,40** | 3,00 | 50 | 10 | 1 | 53816 | **26,17** |
| **1,45** | 3,00 | 50 | 10 | 1 | 53829 | **26,17** |
| **1,50** | 3,00 | 50 | 10 | 1 | 53831 | **26,17** |
| **1,60** | 3,00 | 50 | 10 | 1 | 53836 | **26,17** |
| **1,65** | 3,00 | 50 | 10 | 1 | 53840 | **26,17** |
| **1,70** | 3,00 | 50 | 10 | 1 | 53843 | **26,17** |
| **1,75** | 3,00 | 50 | 10 | 1 | 53847 | **26,17** |
| **1,85** | 3,00 | 50 | 10 | 1 | 53856 | **26,17** |
| **1,90** | 3,00 | 50 | 10 | 1 | 53866 | **26,17** |
| **2,00** | 3,00 | 50 | 12 | 1 | 53868 | **26,17** |
| **2,05** | 3,00 | 50 | 12 | 1 | 53870 | **29,59** |
| **2,10** | 3,00 | 50 | 12 | 1 | 53872 | **29,59** |
| **2,20** | 3,00 | 50 | 12 | 1 | 53873 | **29,59** |
| **2,30** | 3,00 | 50 | 12 | 1 | 53874 | **29,59** |
| **2,40** | 3,00 | 50 | 12 | 1 | 53875 | **29,59** |
| **2,50** | 3,00 | 50 | 12 | 1 | 53876 | **29,59** |
| **3,00** | 6,00 | 60 | 24 | 1 | 53793 | **51,45** |
| **3,10** | 6,00 | 60 | 24 | 1 | 53771 | **51,45** |
| **3,20** | 6,00 | 60 | 24 | 1 | 53772 | **51,45** |
| **3,30** | 6,00 | 60 | 24 | 1 | 53795 | **51,45** |
| **3,50** | 6,00 | 60 | 24 | 1 | 53796 | **51,45** |
| **3,70** | 6,00 | 60 | 24 | 1 | 53773 | **51,45** |
| **3,80** | 6,00 | 60 | 24 | 1 | 53775 | **51,45** |
| **4,00** | 6,00 | 66 | 24 | 1 | 81608 | **51,45** |
| **4,10** | 6,00 | 66 | 24 | 1 | 53777 | **51,45** |

| D mm | d mm | L mm | l mm | | N° Art. SUA | € |
|---|---|---|---|---|---|---|
| **4,20** | 6,00 | 66 | 24 | 1 | 81609 | **51,45** |
| **4,50** | 6,00 | 66 | 24 | 1 | 81610 | **51,45** |
| **4,60** | 6,00 | 66 | 24 | 1 | 81611 | **51,45** |
| **4,80** | 6,00 | 66 | 28 | 1 | 81613 | **51,45** |
| **5,00** | 6,00 | 66 | 28 | 1 | 81614 | **51,45** |
| **5,50** | 6,00 | 66 | 28 | 1 | 81615 | **51,45** |
| **5,70** | 6,00 | 66 | 28 | 1 | 81617 | **51,45** |
| **5,80** | 6,00 | 66 | 28 | 1 | 81618 | **51,45** |
| **6,00** | 6,00 | 66 | 28 | 1 | 81619 | **51,45** |
| **6,50** | 8,00 | 79 | 34 | 1 | 81621 | **83,02** |
| **6,80** | 8,00 | 79 | 34 | 1 | 81622 | **83,02** |
| **7,00** | 8,00 | 79 | 34 | 1 | 81623 | **83,02** |
| **7,40** | 8,00 | 79 | 41 | 1 | 81624 | **83,02** |
| **7,50** | 8,00 | 79 | 41 | 1 | 81625 | **83,02** |
| **7,80** | 8,00 | 79 | 41 | 1 | 81626 | **83,02** |
| New! **7,90** | 8,00 | 79 | 41 | 1 | 22706 | **83,02** |
| **8,00** | 8,00 | 79 | 41 | 1 | 81627 | **83,02** |
| **8,50** | 10,00 | 89 | 47 | 1 | 81628 | **107,40** |
| **8,80** | 10,00 | 89 | 47 | 1 | 81629 | **107,40** |
| **9,00** | 10,00 | 89 | 47 | 1 | 81630 | **107,40** |
| **9,30** | 10,00 | 89 | 47 | 1 | 81632 | **107,40** |
| **9,50** | 10,00 | 89 | 47 | 1 | 81633 | **107,40** |
| **9,80** | 10,00 | 89 | 47 | 1 | 81634 | **107,40** |
| **10,00** | 10,00 | 89 | 47 | 1 | 81635 | **107,40** |
| **10,20** | 12,00 | 102 | 55 | 1 | 81636 | **126,82** |
| **10,50** | 12,00 | 102 | 55 | 1 | 81637 | **126,82** |
| **10,70** | 12,00 | 102 | 55 | 1 | 81638 | **126,82** |
| **11,00** | 12,00 | 102 | 55 | 1 | 81639 | **126,82** |
| **11,20** | 12,00 | 102 | 55 | 1 | 81640 | **126,82** |
| **11,50** | 12,00 | 102 | 55 | 1 | 81641 | **126,82** |
| **11,70** | 12,00 | 102 | 55 | 1 | 81642 | **126,82** |
| **12,00** | 12,00 | 102 | 55 | 1 | 81643 | **126,82** |

# Ref. 9016

## BROCA METAL DURO DESTRUCTORA MACHOS
Tap Destroyer Solid Carbide Drill Bit
Foret carbure destructeur de tarauds




| MD/HM Carbure Grano UF | IZAR Std. | 120° | | HRC 50-65 | Tol. h6 |
|---|---|---|---|---|---|

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 |
| H | 50-55 HRC | 25-30 | 0,040 | 0,060 | 0,080 | 0,100 | 0,150 |
| | 55-60 HRC | 15-25 | 0,040 | 0,060 | 0,080 | 0,100 | 0,150 |
| | 60-65 HRC | 10-15 | 0,020 | 0,040 | 0,060 | 0,080 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | d mm | L mm | l mm | Macho * Tap - Taraud | | N° Art. MD/HM | € |
|---|---|---|---|---|---|---|---|
| **2,00** | 3,00 | 38 | 10 | **M3** | 1 | 58951 | **36,87** |
| **3,00** | 3,00 | 38 | 15 | **M4 - M5** | 1 | 58954 | **36,87** |
| **4,00** | 4,00 | 50 | 20 | **M6** | 1 | 59987 | **50,71** |
| **5,00** | 5,00 | 50 | 25 | **M8 - M10** | 1 | 59989 | **57,08** |
| **6,00** | 6,00 | 60 | 30 | **M12** | 1 | 66145 | **63,38** |
| **7,00** | 8,00 | 79 | 35 | **M14** | 1 | 66399 | **84,63** |
| **8,00** | 8,00 | 79 | 40 | **M16** | 1 | 66407 | **84,63** |
| **9,00** | 10,00 | 100 | 45 | **M18** | 1 | 66408 | **109,49** |
| **10,00** | 10,00 | 100 | 50 | **M20** | 1 | 66409 | **109,49** |

* **El ø de la broca deberá ser superior al ø nucleo del macho.**

**The ø of the drill bit must be greater than the ø of the tap core.**

Le ø du foret doit être supérieur au ø du noyau du taraud.

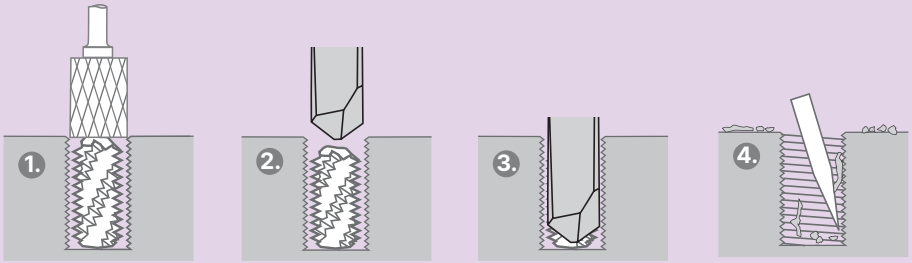
### Set 5 Pcs

| Cont. | N° Art. MD/HM | € |
|---|---|---|
| | | Set Price! |
| **2-3-4-5-6 mm** | 83426 | **232,67** |

- **Diseño especial para retirar machos rotos.**
- **Requiere una buena sujeción de pieza y cabezal rígido.**
- **No válido para extraer machos de laminación.**
- **Specifically designed for removing broken taps.**
- **It is recommended to use a proper fixing with an stable chuck.**
- **Not suitable for forming taps.**
- Conception spéciale pour enlever les tarauds cassés.
- Nécessite un bon serrage de la pièce et une tête rigide.
- Non valide pour retirer les tarauds réfouleurs.

# Ref. 9016

## BROCA METAL DURO DESTRUCTORA MACHOS
Tap Destroyer Solid Carbide Drill Bit
Foret carbure destructeur de tarauds




### PROCEDIMIENTO PARA QUITAR MACHOS ROTOS:

**1. Macho roto**

**Si sobresale alguna parte del macho roto, alisarla para poder taladrarlo más fácilmente.**

**2. Centrado de la broca**

**Colocar la broca sobre el centro del macho, fijando bien tanto la pieza de trabajo como la misma broca.**

**Sin lubricante, hacer un taladrado inicial de aproximación y retraer la broca rápidamente.**

**3. Proceso de taladrado**

**Taladrar a velocidad y avance fijos, y con parones para evacuar la viruta. Utilizar lubricación.**

**4. Sustraer el macho roto**

**Sustraer los restos del macho roto con un buril o instrumento similar.**

### PROCEDURE FOR REMOVING BROKEN TAPS:

**1. Broken Tap**

If any part of the broken tap is protruding, grind the surface in order to make it flat.

**2. Centering of the Drill**

Position the drill bit on the center of the broken tap. Please make sure that both the workpiece and the tap are firmly secured. Make an initial drill approach and retract the drill bit quickly. Don´t use any lubrication.

**3. Drilling**

Drill the hole at a fixed speed and feed, stopping the process occasionally to remove the broken chips. Use lubrication in this step.

**4. Chip Removal**

The parts of the broken tap can be removed using a scriber or a similar tool.

### PROCÉDURE POUR ENLEVER LES TARAUDS CASSÉS :

**1. Taraud cassé**

Si une partie du taraud dépasse, lissez la surface endommagée du taraud au ras de la pièce pour la percer plus facilement.

**2. Centrage du foret**

Placez le foret au centre du taraud. Assurez-vous que la pièce et le foret sont correctement centrés. Faites un premier perçage d'approximation, puis rétractez rapidement le foret. Pour cette étape, n'utilisez pas de lubrifiant.

**3. Processus de perçage**

Percez le trou à vitesse et avance fixes, en arrêtant de temps en temps pour évacuer les copeaux. Utilisez du lubrifiant.

**4. Retirer les restes**

Les restes peuvent être retirés en utilisant un burin ou similaire

New!

Ref. 8401 | Ref. 8402 | Ref. 9470 | Ref. 9475

## GAMA MICROHERRAMIENTAS
Micro Tools
Range micro outils

Ref. 8401
**Gama** - Range - Gamme: **0,20 - 2,90 mm** **Pag. 56**

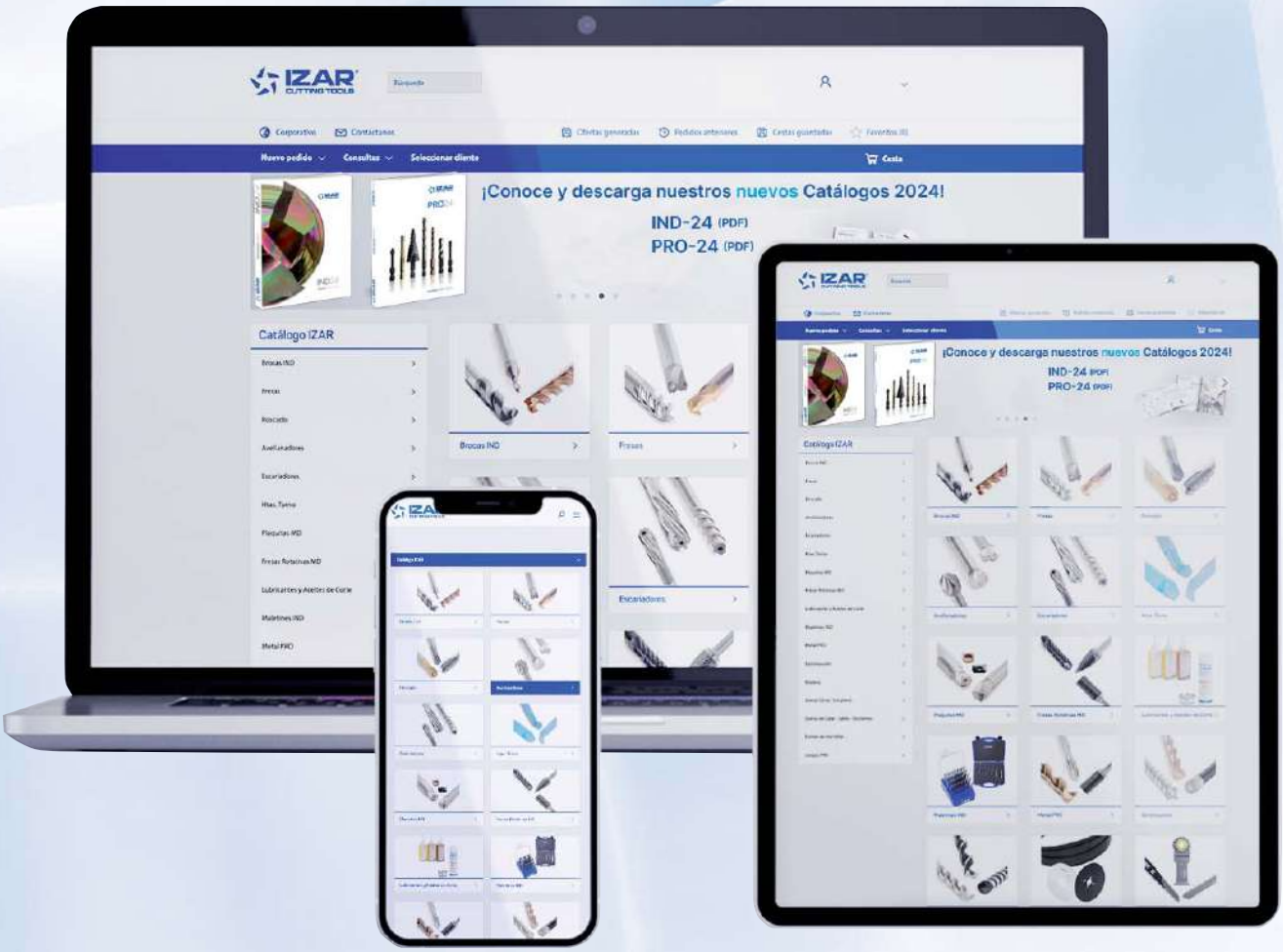
Ref. 8402
**Gama** - Range - Gamme: **1,00 - 2,90 mm** **Pag. 57**

Ref. 9470
**Gama** - Range - Gamme: **0,20 - 4,00 mm** **Pag. 353**

Ref. 9475
**Gama** - Range - Gamme: **0,30 - 4,00 mm** **Pag. 354**

**Soluciones en Mecanizado**
Complete micro machining solutions
Solutions d'usinage

# Nuevo Portal de compras
# New Shopping site
# Nouveau site d'achat

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Gagnez du temps en automatisant les procédures

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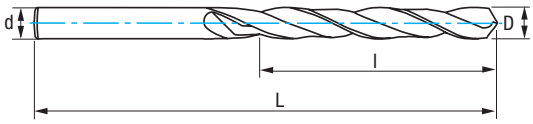
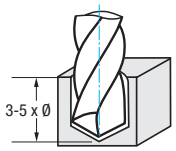
# Ref. 9010

## BROCA METAL DURO SERIE CORTA
Carbide Drill Bit. Jobber Series
Foret carbure série courte




**MD**/HM Carbure Micrograno | DIN 338 N | 118° | 30° | Tol. D h8




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 14 | Ø 16 |
| P | P.1 | 60-75 | 0,026 | 0,045 | 0,066 | 0,088 | 0,110 | 0,130 | 0,160 | 0,180 |
| | P.2 | 55-65 | 0,022 | 0,043 | 0,057 | 0,072 | 0,090 | 0,110 | 0,140 | 0,160 |
| | P.5 | 40-50 | 0,022 | 0,043 | 0,057 | 0,072 | 0,090 | 0,110 | 0,140 | 0,160 |
| M | | 35-45 | 0,022 | 0,036 | 0,050 | 0,062 | 0,065 | 0,072 | 0,076 | 0,080 |
| K | K.1 | 40-70 | 0,044 | 0,090 | 0,140 | 0,200 | 0,240 | 0,290 | 0,320 | 0,350 |
| | K.2 | 40-60 | 0,030 | 0,060 | 0,090 | 0,120 | 0,140 | 0,170 | 0,200 | 0,230 |
| S | | 30-40 | 0,026 | 0,045 | 0,066 | 0,088 | 0,110 | 0,130 | 0,160 | 0,180 |
| N | N.1 | 40-100 | 0,040 | 0,090 | 0,140 | 0,200 | 0,240 | 0,290 | 0,320 | 0,350 |
| | N.2 | 70-150 | 0,040 | 0,090 | 0,140 | 0,200 | 0,240 | 0,290 | 0,320 | 0,350 |
| | N.3 | 100-150 | 0,040 | 0,080 | 0,140 | 0,200 | 0,240 | 0,290 | 0,320 | 0,350 |
| | N.4 | 100-150 | 0,040 | 0,090 | 0,140 | 0,200 | 0,240 | 0,290 | 0,320 | 0,350 |
| | N.5 | 60-120 | 0,040 | 0,080 | 0,130 | 0,160 | 0,200 | 0,240 | 0,260 | 0,280 |
| | N.6 | 80-170 | 0,020 | 0,040 | 0,055 | 0,070 | 0,090 | 0,120 | 0,140 | 0,160 |
| | N.7 | 60-120 | 0,020 | 0,035 | 0,050 | 0,060 | 0,065 | 0,072 | 0,075 | 0,080 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

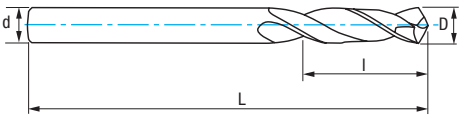
| | D mm | L mm | l mm | | N° Art. MD/HM | € |
|---|---|---|---|---|---|---|
| | 1,00 | 34 | 12 | 1 | 44961 | 8,66 |
| | 1,50 | 40 | 18 | 1 | 44964 | 9,53 |
| New! | 1,80 | 46 | 22 | 1 | 71933 | 14,65 |
| | 2,00 | 49 | 24 | 1 | 44967 | 11,86 |
| | 2,50 | 57 | 30 | 1 | 44970 | 14,34 |
| New! | 2,60 | 57 | 30 | 1 | 72385 | 17,92 |
| New! | 2,70 | 61 | 33 | 1 | 72387 | 17,92 |
| New! | 2,80 | 61 | 33 | 1 | 72388 | 17,92 |
| New! | 2,90 | 61 | 33 | 1 | 72389 | 17,92 |
| | 3,00 | 61 | 33 | 1 | 44973 | 14,70 |
| | 3,10 | 65 | 36 | 1 | 68308 | 19,87 |
| | 3,20 | 65 | 36 | 1 | 65908 | 19,87 |
| | 3,30 | 65 | 36 | 1 | 44976 | 19,87 |
| New! | 3,40 | 70 | 39 | 1 | 72390 | 19,87 |
| | 3,50 | 70 | 39 | 1 | 44979 | 19,58 |
| New! | 3,60 | 70 | 39 | 1 | 72391 | 22,03 |
| | 3,70 | 70 | 39 | 1 | 68309 | 22,03 |
| | 3,80 | 75 | 43 | 1 | 68310 | 22,03 |
| New! | 3,90 | 75 | 43 | 1 | 72392 | 22,03 |
| | 4,00 | 75 | 43 | 1 | 44982 | 22,03 |
| | 4,10 | 75 | 43 | 1 | 68311 | 27,11 |

| | D mm | L mm | l mm | | N° Art. MD/HM | € |
|---|---|---|---|---|---|---|
| | 4,20 | 75 | 43 | 1 | 44985 | 27,11 |
| | 4,30 | 80 | 47 | 1 | 68312 | 27,11 |
| New! | 4,40 | 80 | 47 | 1 | 72393 | 27,11 |
| | 4,50 | 80 | 47 | 1 | 44988 | 26,92 |
| | 4,60 | 80 | 47 | 1 | 56854 | 32,86 |
| New! | 4,70 | 80 | 47 | 1 | 72394 | 32,86 |
| | 4,80 | 86 | 52 | 1 | 68313 | 32,86 |
| | 4,90 | 86 | 52 | 1 | 68314 | 32,86 |
| | 5,00 | 86 | 52 | 1 | 44991 | 32,86 |
| | 5,10 | 86 | 52 | 1 | 68315 | 32,86 |
| | 5,50 | 93 | 57 | 1 | 44997 | 36,78 |
| | 6,00 | 93 | 57 | 1 | 45000 | 39,10 |
| New! | 6,20 | 101 | 63 | 1 | 56857 | 45,84 |
| New! | 6,30 | 101 | 63 | 1 | 56858 | 45,84 |
| | 6,50 | 101 | 63 | 1 | 45003 | 41,89 |
| | 6,80 | 109 | 69 | 1 | 45004 | 41,89 |
| | 6,90 | 109 | 69 | 1 | 68323 | 41,89 |
| | 7,00 | 109 | 69 | 1 | 45007 | 41,89 |
| | 7,50 | 109 | 69 | 1 | 45008 | 41,89 |
| New! | 7,80 | 117 | 75 | 1 | 68326 | 66,95 |
| | 8,00 | 117 | 75 | 1 | 45009 | 49,28 |

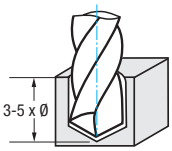
| | D mm | L mm | l mm | | N° Art. MD/HM | € |
|---|---|---|---|---|---|---|
| | 8,50 | 117 | 75 | 1 | 45010 | 55,28 |
| | 8,60 | 125 | 81 | 1 | 68329 | 55,28 |
| | 9,00 | 125 | 81 | 1 | 45011 | 59,89 |
| New! | 9,40 | 125 | 81 | 1 | 72409 | 85,49 |
| | 9,50 | 125 | 81 | 1 | 45012 | 59,89 |
| New! | 9,60 | 133 | 87 | 1 | 72410 | 97,85 |
| New! | 9,70 | 133 | 87 | 1 | 72411 | 97,85 |
| New! | 9,90 | 133 | 87 | 1 | 72412 | 97,85 |
| | 10,00 | 133 | 87 | 1 | 45013 | 59,89 |
| | 10,20 | 133 | 87 | 1 | 45014 | 89,16 |
| | 10,30 | 133 | 87 | 1 | 68334 | 89,16 |
| | 10,50 | 133 | 87 | 1 | 45015 | 89,16 |
| | 11,00 | 142 | 94 | 1 | 45016 | 89,16 |
| | 11,50 | 142 | 94 | 1 | 45017 | 89,16 |
| | 12,00 | 151 | 101 | 1 | 45018 | 89,16 |
| New! | 12,50 | 151 | 101 | 1 | 86110 | 119,75 |
| | 13,00 | 151 | 101 | 1 | 45019 | 119,75 |
| New! | 14,00 | 160 | 108 | 1 | 45020 | 190,55 |
| New! | 14,50 | 169 | 114 | 1 | 85478 | 205,74 |
| | 15,00 | 169 | 114 | 1 | 45021 | 207,87 |
| New! | 18,00 | 191 | 130 | 1 | 85479 | 358,13 |

# Ref. 9056

## BROCA METAL DURO SERIE EXTRA CORTA
Carbide Drill Bit. Stub Series
Foret carbure série extra-courte




**MD**/HM Carbure Micrograno | DIN 6539 N | 118° | 30° | Tol. D h8




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 14 | Ø 16 |
| P | P.1 | 60-75 | 0,026 | 0,045 | 0,066 | 0,088 | 0,110 | 0,130 | 0,160 | 0,180 |
| | P.2 | 55-65 | 0,022 | 0,043 | 0,057 | 0,072 | 0,090 | 0,110 | 0,140 | 0,160 |
| | P.5 | 40-50 | 0,022 | 0,043 | 0,057 | 0,072 | 0,090 | 0,110 | 0,140 | 0,160 |
| M | | 35-45 | 0,022 | 0,036 | 0,050 | 0,062 | 0,065 | 0,072 | 0,076 | 0,080 |
| K | K.1 | 40-70 | 0,044 | 0,090 | 0,140 | 0,200 | 0,240 | 0,290 | 0,320 | 0,350 |
| | K.2 | 40-60 | 0,030 | 0,060 | 0,090 | 0,120 | 0,140 | 0,170 | 0,200 | 0,230 |
| S | | 30-40 | 0,026 | 0,045 | 0,066 | 0,088 | 0,110 | 0,130 | 0,160 | 0,180 |
| N | N.1 | 40-100 | 0,040 | 0,090 | 0,140 | 0,200 | 0,240 | 0,290 | 0,320 | 0,350 |
| | N.2 | 70-150 | 0,040 | 0,090 | 0,140 | 0,200 | 0,240 | 0,290 | 0,320 | 0,350 |
| | N.3 | 100-150 | 0,040 | 0,080 | 0,140 | 0,200 | 0,240 | 0,290 | 0,320 | 0,350 |
| | N.4 | 100-150 | 0,040 | 0,090 | 0,140 | 0,200 | 0,240 | 0,290 | 0,320 | 0,350 |
| | N.5 | 60-120 | 0,040 | 0,080 | 0,130 | 0,160 | 0,200 | 0,240 | 0,260 | 0,280 |
| | N.6 | 80-170 | 0,020 | 0,040 | 0,055 | 0,070 | 0,090 | 0,120 | 0,140 | 0,160 |
| | N.7 | 60-120 | 0,020 | 0,035 | 0,050 | 0,060 | 0,065 | 0,072 | 0,075 | 0,080 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times Ø}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | L mm | l mm | | N° Art. MD/HM | € |
|---|---|---|---|---|---|
| 1,00 | 26 | 6 | 1 | 72203 | 5,53 |
| 1,50 | 32 | 9 | 1 | 74087 | 6,70 |
| 2,00 | 38 | 12 | 1 | 72230 | 7,28 |
| 2,50 | 43 | 14 | 1 | 72245 | 8,18 |
| 3,00 | 46 | 16 | 1 | 72260 | 10,50 |
| 3,20 | 49 | 18 | 1 | 74878 | 12,90 |
| 3,30 | 49 | 18 | 1 | 72266 | 12,90 |
| 3,50 | 52 | 20 | 1 | 74090 | 12,56 |
| 4,00 | 55 | 22 | 1 | 72281 | 14,61 |
| 4,10 | 55 | 22 | 1 | 69421 | 17,79 |
| 4,20 | 55 | 22 | 1 | 72287 | 17,79 |
| 4,50 | 58 | 24 | 1 | 72296 | 16,60 |

| D mm | L mm | l mm | | N° Art. MD/HM | € |
|---|---|---|---|---|---|
| 5,00 | 62 | 26 | 1 | 72311 | 18,36 |
| 5,20 | 62 | 26 | 1 | 72317 | 24,17 |
| 5,50 | 66 | 28 | 1 | 72326 | 22,18 |
| 6,00 | 66 | 28 | 1 | 72341 | 26,38 |
| 6,50 | 70 | 31 | 1 | 72356 | 31,95 |
| 6,80 | 74 | 34 | 1 | 72365 | 39,30 |
| 7,00 | 74 | 34 | 1 | 72371 | 35,61 |
| 7,50 | 74 | 34 | 1 | 72386 | 39,30 |
| 8,00 | 79 | 36 | 1 | 72401 | 47,63 |
| 8,50 | 79 | 36 | 1 | 72416 | 52,33 |
| 9,00 | 84 | 40 | 1 | 72419 | 55,37 |
| 9,50 | 84 | 40 | 1 | 72422 | 58,15 |

| D mm | L mm | l mm | | N° Art. MD/HM | € |
|---|---|---|---|---|---|
| 10,00 | 89 | 43 | 1 | 72425 | 64,18 |
| 10,20 | 89 | 43 | 1 | 14287 | 67,59 |
| 10,50 | 89 | 43 | 1 | 72428 | 71,27 |
| 11,00 | 95 | 47 | 1 | 72431 | 80,72 |
| 11,50 | 95 | 47 | 1 | 72434 | 88,01 |
| 12,00 | 102 | 51 | 1 | 72437 | 95,60 |
| 13,00 | 102 | 51 | 1 | 72440 | 112,29 |
| 14,00 | 107 | 54 | 1 | 72443 | 132,21 |
| 15,00 | 111 | 56 | 1 | 72446 | 158,69 |
| 16,00 | 115 | 58 | 1 | 72449 | 178,39 |

New!

# BROCA MD 3Z ALTO AVANCE
## High Feed 3Z Carbide Drill Bit
## Foret carbure 3Z haute avance

Ref. 9075

Video

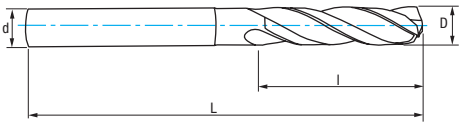
- **Mejora drástica de los tiempos de producción gracias a avances superiores.**
- **Mejora la precisión de los agujeros.**
- **Testado en diferentes materiales obteniendo excelentes resultados. Destaca en aceros, fundición e inoxidables.**

- Faster production time thanks to the higher feeds.
- Remarkably accurate holes.
- Extensively tested in a wide range of materials, obtaining outstanding results in steels, stainless steels and cast iron.

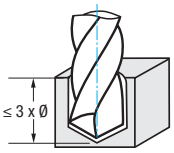
- Amélioration drastique des temps de production grâce à des avancées supérieures.
- Trous beaucoup plus précis.
- Testé sur différents matériaux obtenant d'excellents résultats. Se distingue en acier, fonte et acier inoxydable.

# Ref. 9075

## BROCA MD 3Z ALTO AVANCE
High Feed 3Z Carbide Drill Bit
Foret carbure 3Z haute avance




| MD/HM Carbure Grano UF | X-AlCr | IZAR Std. | 150° | 30° | 3 Z | Pulido Espejo Mirror Polished Polyglass | 3XD |
|---|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | X-AlCr | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| P | P.1 | 100-120 | 0,135 | 0,210 | 0,300 | 0,360 | 0,420 |
| | P.2 | 90-110 | 0,135 | 0,210 | 0,300 | 0,360 | 0,420 |
| | P.5 | 50-65 | 0,060 | 0,098 | 0,128 | 0,180 | 0,210 |
| M | | 60-70 | 0,060 | 0,098 | 0,128 | 0,180 | 0,210 |
| K | K.1 | 125-150 | 0,203 | 0,218 | 0,300 | 0,353 | 0,398 |
| | K.2 | 90-110 | 0,180 | 0,203 | 0,263 | 0,278 | 0,300 |
| N | N.3 | 90-300 | 0,120 | 0,190 | 0,266 | 0,320 | 0,370 |
| | N.4 | 90-300 | 0,120 | 0,190 | 0,266 | 0,320 | 0,370 |
| | N.5 | 70-150 | 0,120 | 0,190 | 0,266 | 0,320 | 0,370 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

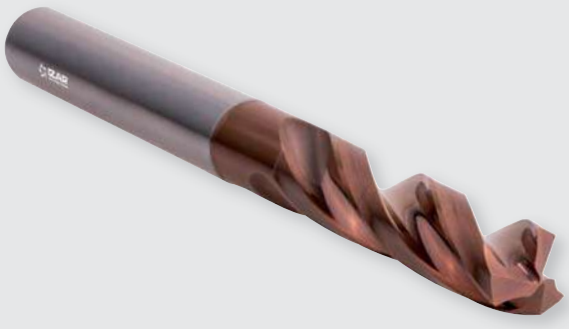
| D mm | d mm | L mm | l mm | | N° Art. X-AlCr | € |
|---|---|---|---|---|---|---|
| **3,00** | 4,00 | 46 | 16 | 1 | 20210 | **42,08** |
| **3,30** | 4,00 | 49 | 18 | 1 | 20211 | **42,08** |
| **3,50** | 4,00 | 52 | 20 | 1 | 20213 | **42,08** |
| **4,00** | 4,00 | 55 | 22 | 1 | 20215 | **42,08** |
| **4,20** | 6,00 | 55 | 22 | 1 | 20216 | **50,59** |
| **4,50** | 6,00 | 58 | 24 | 1 | 20221 | **50,59** |
| **5,00** | 6,00 | 62 | 26 | 1 | 20226 | **50,59** |
| **5,50** | 6,00 | 66 | 28 | 1 | 20228 | **50,59** |
| **6,00** | 6,00 | 66 | 28 | 1 | 20236 | **50,59** |
| **6,50** | 8,00 | 70 | 31 | 1 | 20242 | **75,65** |
| **6,80** | 8,00 | 74 | 34 | 1 | 20247 | **75,65** |
| **7,00** | 8,00 | 74 | 34 | 1 | 20253 | **75,65** |

| D mm | d mm | L mm | l mm | | N° Art. X-AlCr | € |
|---|---|---|---|---|---|---|
| **7,50** | 8,00 | 74 | 34 | 1 | 20262 | **75,65** |
| **8,00** | 8,00 | 79 | 36 | 1 | 20270 | **75,65** |
| **8,50** | 10,00 | 79 | 36 | 1 | 20273 | **101,18** |
| **9,00** | 10,00 | 84 | 40 | 1 | 20275 | **114,89** |
| **9,50** | 10,00 | 84 | 40 | 1 | 20280 | **114,89** |
| **10,00** | 10,00 | 89 | 43 | 1 | 20282 | **114,89** |
| **10,20** | 12,00 | 89 | 43 | 1 | 20284 | **146,56** |
| **10,50** | 12,00 | 89 | 43 | 1 | 20288 | **146,56** |
| **11,00** | 12,00 | 95 | 47 | 1 | 20290 | **146,56** |
| **11,50** | 12,00 | 95 | 47 | 1 | 20291 | **146,56** |
| **12,00** | 12,00 | 102 | 51 | 1 | 20294 | **146,56** |
| **13,00** | 14,00 | 102 | 51 | 1 | 20295 | **186,75** |

- **Avance hasta x2 comparando con broca 2Z convencional.**
- **Recubrimiento Alto Rendimiento X-AlCr.**
- **Agujeros más precisos con mejor acabado superficial.**
- **Punta Autocentrante.**

- **Up to x2 feed vs standard 2Z drill bits.**
- **High performance X-AlCr coating with polished surface.**
- **Remarkably accurate holes and outstanding surface finishing.**
- **Self-centering function geometry.**

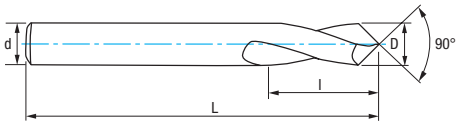
- Avance jusqu'à x2 par rapport au foret 2Z conventionnel.
- Revêtement haute performance X-AlCr avec surface polie.
- Trous plus précis avec une meilleure finition de surface.
- Pointe d'auto-centrage.



Video

# Ref. 9301

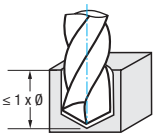
## BROCA CENTRAR METAL DURO CNC 90º
90º Carbide CNC Center Drill
Foret carbure à centrer CNC 90º




**MD**/HM Carbure Micrograno

IZAR Std.

90°




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 2 | Ø 3 | Ø 6 | Ø 10 | Ø 16 |
| P | P.1 | 60-75 | 0,070 | 0,090 | 0,150 | 0,200 | 0,250 |
| | P.2 | 40-55 | 0,070 | 0,090 | 0,150 | 0,200 | 0,250 |
| | P.3 | 25-30 | 0,060 | 0,080 | 0,140 | 0,170 | 0,200 |
| | P.5 | 20-30 | 0,060 | 0,080 | 0,140 | 0,200 | 0,220 |
| M | | 20-30 | 0,060 | 0,080 | 0,140 | 0,200 | 0,220 |
| K | K.1 | 45-50 | 0,100 | 0,120 | 0,170 | 0,220 | 0,250 |
| | K.2 | 45-50 | 0,100 | 0,120 | 0,170 | 0,220 | 0,250 |
| S | | 20-30 | 0,050 | 0,060 | 0,080 | 0,120 | 0,150 |
| N | N.1 | 55-60 | 0,100 | 0,120 | 0,150 | 0,220 | 0,250 |
| | N.2 | 55-60 | 0,100 | 0,120 | 0,150 | 0,220 | 0,250 |
| | N.3 | 100-110 | 0,120 | 0,140 | 0,160 | 0,220 | 0,250 |
| | N.4 | 100-110 | 0,120 | 0,140 | 0,160 | 0,220 | 0,250 |
| | N.5 | 70-90 | 0,120 | 0,140 | 0,160 | 0,220 | 0,250 |
| | N.6 | 150-200 | 0,150 | 0,160 | 0,220 | 0,280 | 0,300 |

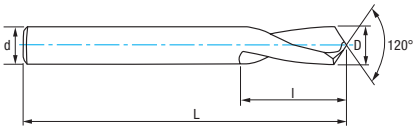
$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times Ø}$$

$$Vf\ (mm/min.) = \text{r.p.m.} \times f$$

| D mm | L mm | l mm | N° Art. MD/HM | € |
|---|---|---|---|---|
| **2,00** | 40 | 8 | 68397 | **24,45** |
| **3,00** | 45 | 10 | 68398 | **24,72** |
| **4,00** | 50 | 12 | 68399 | **29,45** |
| **5,00** | 50 | 15 | 68400 | **38,18** |
| **6,00** | 50 | 18 | 44862 | **53,78** |
| **8,00** | 60 | 23 | 44865 | **76,21** |
| **10,00** | 70 | 24 | 44868 | **98,41** |
| **12,00** | 70 | 24 | 44871 | **148,20** |
| **16,00** | 80 | 26 | 44874 | **181,08** |
| **20,00** | 100 | 35 | 44877 | **321,10** |

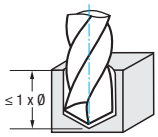
# Ref. 9303

## BROCA CENTRAR METAL DURO CNC 120º
120º CNC Carbide Center Drill
Foret carbure à centrer CNC 120º




**MD**/HM Carbure Micrograno

IZAR Std.




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 2 | Ø 3 | Ø 6 | Ø 10 | Ø 16 |
| P | P.1 | 60-75 | 0,070 | 0,090 | 0,150 | 0,200 | 0,250 |
| | P.2 | 40-55 | 0,070 | 0,090 | 0,150 | 0,200 | 0,250 |
| | P.3 | 25-30 | 0,060 | 0,080 | 0,140 | 0,170 | 0,200 |
| | P.5 | 20-30 | 0,060 | 0,080 | 0,140 | 0,200 | 0,220 |
| M | | 20-30 | 0,060 | 0,080 | 0,140 | 0,200 | 0,220 |
| K | K.1 | 45-50 | 0,100 | 0,120 | 0,170 | 0,220 | 0,250 |
| | K.2 | 45-50 | 0,100 | 0,120 | 0,170 | 0,220 | 0,250 |
| S | | 20-30 | 0,050 | 0,060 | 0,080 | 0,120 | 0,150 |
| N | N.1 | 55-60 | 0,100 | 0,120 | 0,150 | 0,220 | 0,250 |
| | N.2 | 55-60 | 0,100 | 0,120 | 0,150 | 0,220 | 0,250 |
| | N.3 | 100-110 | 0,120 | 0,140 | 0,160 | 0,220 | 0,250 |
| | N.4 | 100-110 | 0,120 | 0,140 | 0,160 | 0,220 | 0,250 |
| | N.5 | 70-90 | 0,120 | 0,140 | 0,160 | 0,220 | 0,250 |
| | N.6 | 150-200 | 0,150 | 0,160 | 0,220 | 0,280 | 0,300 |

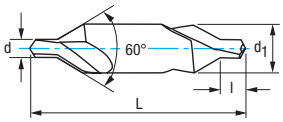
$$\text{r.p.m.} = \frac{\text{Vc x 1.000}}{\pi \text{ x } \varnothing}$$

$$\text{Vf (mm/min.)} = \text{r.p.m. x f}$$

| D mm | L mm | l mm | N° Art. MD/HM | € |
|---|---|---|---|---|
| **2,00** | 40 | 8 | 68401 | **24,45** |
| **3,00** | 45 | 10 | 68402 | **24,72** |
| **4,00** | 50 | 12 | 68403 | **29,45** |
| **5,00** | 50 | 15 | 68404 | **38,18** |
| **6,00** | 50 | 18 | 44878 | **53,78** |
| **8,00** | 60 | 23 | 44880 | **76,21** |
| **10,00** | 70 | 24 | 44883 | **98,41** |
| **12,00** | 70 | 24 | 44889 | **148,20** |
| **16,00** | 80 | 26 | 44892 | **181,08** |
| **20,00** | 100 | 35 | 44895 | **321,10** |

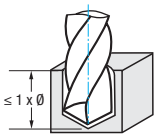
# Ref. 9310

## BROCA CENTRAR DOBLE METAL DURO
Double Center Carbide Drill
Foret carbure à centrer double




**MD**/HM Carbure Micrograno

DIN 333 A

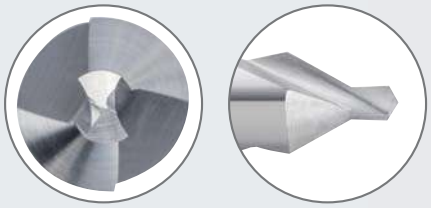



| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 2 | Ø 3 | Ø 6 | Ø 10 | Ø 16 |
| P | P.1 | 60-75 | 0,070 | 0,090 | 0,150 | 0,200 | 0,250 |
| | P.2 | 50-60 | 0,070 | 0,090 | 0,150 | 0,200 | 0,250 |
| | P.3 | 25-40 | 0,060 | 0,080 | 0,140 | 0,170 | 0,200 |
| | P.5 | 20-30 | 0,060 | 0,080 | 0,140 | 0,200 | 0,220 |
| M | | 20-30 | 0,060 | 0,080 | 0,140 | 0,200 | 0,220 |
| K | K.1 | 50-60 | 0,100 | 0,120 | 0,170 | 0,220 | 0,250 |
| | K.2 | 35-50 | 0,100 | 0,120 | 0,170 | 0,220 | 0,250 |
| S | | 20-30 | 0,050 | 0,060 | 0,080 | 0,120 | 0,150 |
| N | N.1 | 70-100 | 0,100 | 0,120 | 0,150 | 0,220 | 0,250 |
| | N.2 | 70-100 | 0,100 | 0,120 | 0,150 | 0,220 | 0,250 |
| | N.3 | 100-150 | 0,120 | 0,140 | 0,160 | 0,220 | 0,250 |
| | N.4 | 100-150 | 0,120 | 0,140 | 0,160 | 0,220 | 0,250 |
| | N.5 | 70-90 | 0,120 | 0,140 | 0,160 | 0,220 | 0,250 |
| | N.6 | 150-200 | 0,150 | 0,160 | 0,220 | 0,280 | 0,300 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

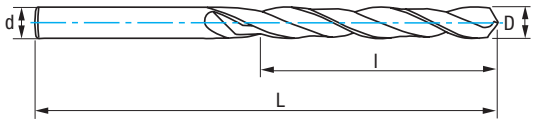
$$Vf\ (mm/min.) = r.p.m. \times f$$

| d mm | | d1 mm | L mm | l mm | N° Art. MD/HM | € |
|---|---|---|---|---|---|---|
| **1,00** | x | **3,15** | 31 | 1,3-1,7 | 68405 | **38,57** |
| **1,25** | x | **3,15** | 31 | 1,6-2,0 | 68406 | **38,57** |
| **1,60** | x | **4,00** | 35 | 2,0-2,6 | 68407 | **39,69** |
| **2,00** | x | **5,00** | 40 | 2,5-3,1 | 68408 | **49,59** |
| **2,50** | x | **6,30** | 45 | 3,1-3,8 | 68409 | **58,96** |
| **3,15** | x | **8,00** | 50 | 3,9-4,6 | 68410 | **71,65** |
| **4,00** | x | **10,00** | 55 | 5,0-5,9 | 68411 | **95,33** |
| **5,00** | x | **12,50** | 63 | 6,3-7,2 | 68412 | **160,92** |
| **6,30** | x | **16,00** | 71 | 8,0-8,9 | 68413 | **254,60** |

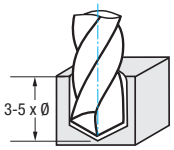


# Ref. 9100

## BROCA PUNTA METAL DURO. SERIE CORTA
Carbide Tipped Drill Bit. Jobber Series
Foret pointe carbure




| MD HM Carbure | DIN 338 N | 118° | Rectificado Ground Taillé meulé | Tol. D h7 |
|---|---|---|---|---|




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

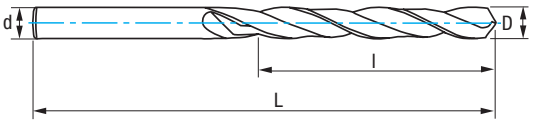
| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.2 | 30-50 | 0,015 | 0,025 | 0,035 | 0,045 | 0,050 | 0,055 | 0,070 | 0,080 |
| | P.3 | 10-15 | 0,010 | 0,020 | 0,030 | 0,040 | 0,040 | 0,050 | 0,050 | 0,060 |
| | P.5 | 12-25 | 0,010 | 0,020 | 0,030 | 0,040 | 0,040 | 0,050 | 0,050 | 0,060 |
| M | | 10-25 | 0,010 | 0,020 | 0,030 | 0,040 | 0,040 | 0,050 | 0,050 | 0,060 |
| K | K.1 | 50-90 | 0,020 | 0,040 | 0,060 | 0,060 | 0,070 | 0,080 | 0,100 | 0,120 |
| | K.2 | 40-60 | 0,010 | 0,020 | 0,030 | 0,040 | 0,050 | 0,050 | 0,060 | 0,060 |
| S | | 20-35 | 0,015 | 0,030 | 0,030 | 0,035 | 0,050 | 0,060 | 0,080 | 0,090 |
| N | N.1 | 40-100 | 0,030 | 0,060 | 0,100 | 0,100 | 0,120 | 0,140 | 0,160 | 0,180 |
| | N.2 | 40-100 | 0,030 | 0,060 | 0,100 | 0,100 | 0,120 | 0,140 | 0,160 | 0,180 |
| | N.7 | 20-100 | 0,022 | 0,040 | 0,050 | 0,060 | 0,065 | 0,070 | 0,080 | 0,120 |

| D mm | L mm | l mm | | N° Art. MD/HM | € |
|---|---|---|---|---|---|
| **2,00** | 49 | 24 | 1 | 71429 | **16,44** |
| **2,50** | 57 | 30 | 1 | 71444 | **16,44** |
| **2,70** | 57 | 30 | 1 | 46916 | **16,44** |
| **3,00** | 61 | 33 | 1 | 71459 | **16,44** |
| **3,10** | 61 | 33 | 1 | 46917 | **16,93** |
| **3,20** | 65 | 36 | 1 | 23058 | **16,93** |
| **3,30** | 65 | 36 | 1 | 26716 | **16,93** |
| **3,40** | 70 | 39 | 1 | 29479 | **16,93** |
| **3,50** | 70 | 39 | 1 | 71474 | **16,93** |
| **3,60** | 70 | 39 | 1 | 52285 | **16,93** |
| **4,00** | 75 | 43 | 1 | 71489 | **16,93** |
| **4,10** | 75 | 43 | 1 | 46918 | **16,93** |
| **4,20** | 75 | 43 | 1 | 22016 | **16,93** |
| **4,50** | 80 | 47 | 1 | 71504 | **17,37** |
| **4,60** | 80 | 47 | 1 | 26963 | **17,37** |
| **4,70** | 80 | 47 | 1 | 17101 | **17,37** |
| **4,80** | 86 | 52 | 1 | 26964 | **17,37** |
| **5,00** | 86 | 52 | 1 | 71516 | **17,37** |
| **5,10** | 86 | 52 | 1 | 23059 | **18,32** |
| **5,20** | 86 | 52 | 1 | 67682 | **18,32** |
| **5,50** | 93 | 57 | 1 | 71531 | **18,32** |
| **5,60** | 93 | 57 | 1 | 32603 | **19,22** |
| **5,70** | 93 | 57 | 1 | 23889 | **19,22** |
| **5,80** | 93 | 57 | 1 | 54039 | **19,22** |
| **6,00** | 93 | 57 | 1 | 71543 | **19,22** |
| **6,10** | 101 | 63 | 1 | 23891 | **22,90** |
| **6,20** | 101 | 63 | 1 | 32691 | **22,90** |

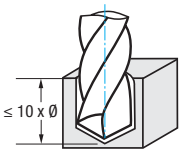
| D mm | L mm | l mm | | N° Art. MD/HM | € |
|---|---|---|---|---|---|
| **6,30** | 101 | 63 | 1 | 32692 | **22,90** |
| **6,50** | 101 | 63 | 1 | 71558 | **22,90** |
| **6,60** | 101 | 63 | 1 | 30614 | **22,91** |
| **6,80** | 109 | 69 | 1 | 23893 | **22,91** |
| **7,00** | 109 | 69 | 1 | 71573 | **22,91** |
| **7,50** | 109 | 69 | 1 | 71585 | **23,81** |
| **7,80** | 117 | 75 | 1 | 23914 | **23,81** |
| **8,00** | 117 | 75 | 1 | 71600 | **23,81** |
| **8,50** | 117 | 75 | 1 | 71615 | **25,98** |
| **8,60** | 125 | 81 | 1 | 27007 | **40,41** |
| **9,00** | 125 | 81 | 1 | 71630 | **25,98** |
| **9,50** | 125 | 81 | 1 | 71645 | **28,38** |
| **10,00** | 133 | 87 | 1 | 71660 | **28,38** |
| **10,20** | 133 | 87 | 1 | 27008 | **36,57** |
| **10,50** | 133 | 87 | 1 | 71663 | **36,57** |
| **11,00** | 142 | 94 | 1 | 71666 | **36,57** |
| **11,50** | 142 | 94 | 1 | 71672 | **42,05** |
| **12,00** | 151 | 101 | 1 | 71675 | **42,05** |
| **12,50** | 151 | 101 | 1 | 71681 | **50,33** |
| **13,00** | 151 | 101 | 1 | 71684 | **50,33** |
| **14,00** | 160 | 108 | 1 | 71690 | **58,56** |
| **15,00** | 169 | 114 | 1 | 71696 | **66,77** |
| **16,00** | 178 | 120 | 1 | 71702 | **76,87** |
| **17,00** | 184 | 125 | 1 | 71705 | **84,17** |
| **18,00** | 191 | 130 | 1 | 71711 | **90,59** |
| **19,00** | 198 | 135 | 1 | 71717 | **112,54** |
| **20,00** | 205 | 140 | 1 | 71723 | **128,09** |

# Ref. 9036

## BROCA PUNTA METAL DURO. SERIE LARGA
Carbide Tipped Drill Bit. Long Series
Foret pointe carbure serie longue




MD/HM Carbure | DIN 340 N | 118° | Bright Finish (Black Flute) | **Rectificado Ground** Taillé meulé | Tol. D h7




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.2 | 30-50 | 0,015 | 0,025 | 0,035 | 0,045 | 0,050 | 0,055 | 0,070 | 0,080 |
| | P.3 | 10-15 | 0,010 | 0,020 | 0,030 | 0,040 | 0,040 | 0,050 | 0,050 | 0,060 |
| | P.5 | 12-25 | 0,010 | 0,020 | 0,030 | 0,040 | 0,040 | 0,050 | 0,050 | 0,060 |
| M | | 10-25 | 0,010 | 0,020 | 0,030 | 0,040 | 0,040 | 0,050 | 0,050 | 0,060 |
| K | K.1 | 50-90 | 0,020 | 0,040 | 0,060 | 0,060 | 0,070 | 0,080 | 0,100 | 0,120 |
| | K.2 | 40-60 | 0,010 | 0,020 | 0,030 | 0,040 | 0,050 | 0,050 | 0,060 | 0,060 |
| S | | 20-35 | 0,015 | 0,030 | 0,030 | 0,035 | 0,050 | 0,060 | 0,080 | 0,090 |
| N | N.1 | 40-100 | 0,030 | 0,060 | 0,100 | 0,100 | 0,120 | 0,140 | 0,160 | 0,180 |
| | N.2 | 40-100 | 0,030 | 0,060 | 0,100 | 0,100 | 0,120 | 0,140 | 0,160 | 0,180 |
| | N.7 | 20-100 | 0,022 | 0,040 | 0,050 | 0,060 | 0,065 | 0,070 | 0,080 | 0,120 |

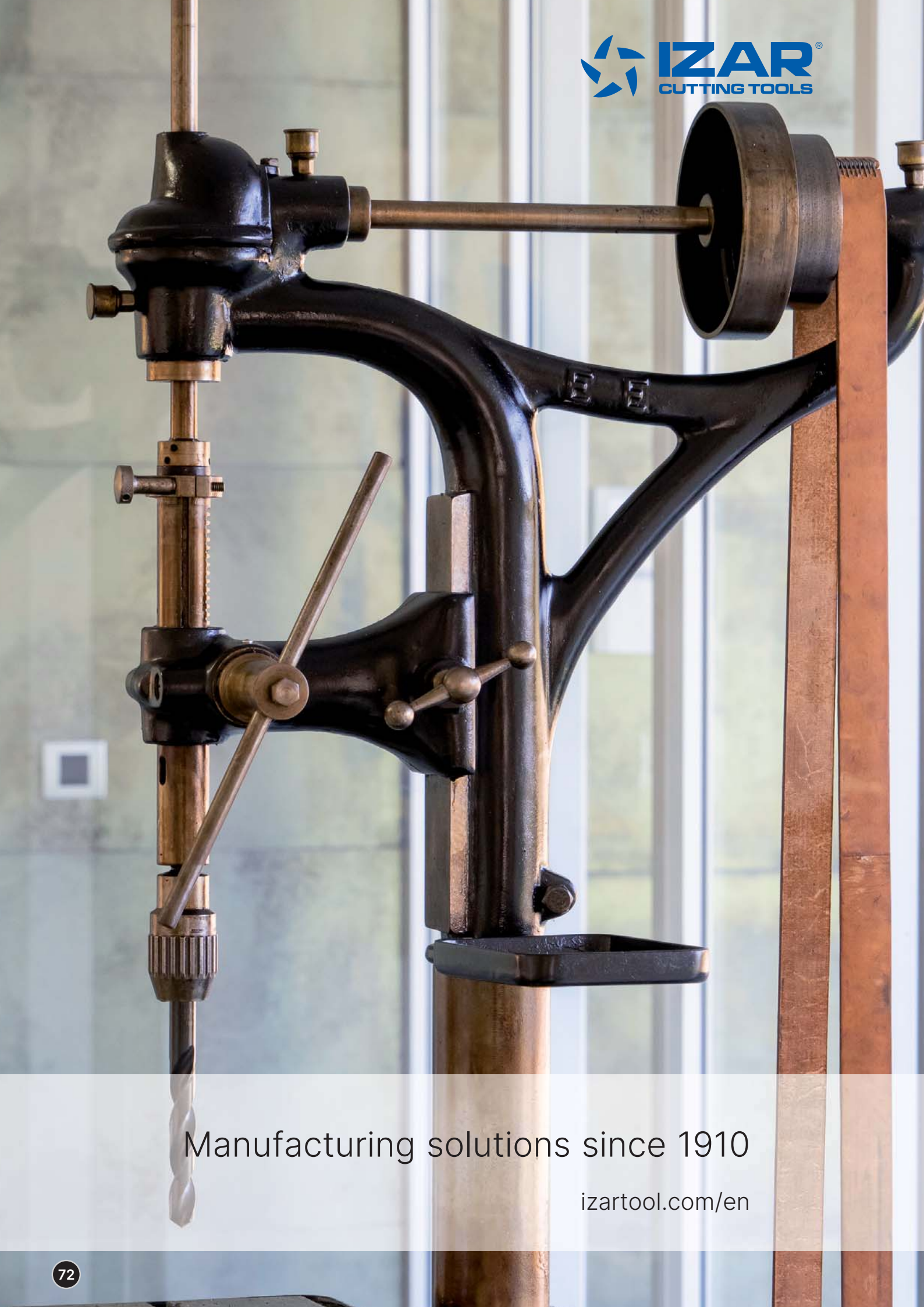
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x f**

* **Se recomienda reducir el avance entre 2/3 y 1/2**
* **It is recommended to reduce Feed between 2/3 & 1/2**
* On conseille réduire l´avance entre 2/3 et 1/2

| D mm | L mm | l mm | | N° Art. MD/HM | € |
|---|---|---|---|---|---|
| **2,00** | 85 | 56 | 1 | 71786 | **30,08** |
| **2,50** | 95 | 62 | 1 | 73901 | **29,77** |
| **3,00** | 100 | 66 | 1 | 71813 | **26,69** |
| **3,10** | 106 | 69 | 1 | 71816 | **30,97** |
| **3,20** | 106 | 69 | 1 | 67853 | **30,97** |
| **3,30** | 106 | 69 | 1 | 70588 | **30,97** |
| **3,50** | 112 | 73 | 1 | 71825 | **25,55** |
| **4,00** | 119 | 78 | 1 | 71840 | **26,46** |
| **4,10** | 119 | 78 | 1 | 69337 | **32,77** |
| **4,50** | 126 | 82 | 1 | 71855 | **27,05** |
| **5,00** | 132 | 87 | 1 | 71867 | **27,30** |
| **5,20** | 132 | 87 | 1 | 69339 | **35,92** |
| **5,50** | 139 | 91 | 1 | 71882 | **29,65** |
| **6,00** | 139 | 91 | 1 | 71894 | **29,65** |
| **6,20** | 148 | 97 | 1 | 71900 | **38,58** |
| **6,50** | 148 | 97 | 1 | 71909 | **31,85** |
| **6,70** | 148 | 97 | 1 | 71915 | **38,58** |
| **6,80** | 156 | 102 | 1 | 67683 | **38,58** |
| **7,00** | 156 | 102 | 1 | 71924 | **31,85** |

| D mm | L mm | l mm | | N° Art. MD/HM | € |
|---|---|---|---|---|---|
| **7,50** | 156 | 102 | 1 | 71939 | **36,35** |
| **8,00** | 165 | 109 | 1 | 71954 | **36,35** |
| **8,50** | 165 | 109 | 1 | 71969 | **46,22** |
| **9,00** | 175 | 109 | 1 | 71972 | **40,20** |
| **9,50** | 175 | 115 | 1 | 71975 | **42,79** |
| **10,00** | 184 | 115 | 1 | 71978 | **42,79** |
| **10,50** | 184 | 121 | 1 | 71981 | **57,65** |
| **11,00** | 195 | 121 | 1 | 71984 | **57,65** |
| **11,50** | 195 | 128 | 1 | 71987 | **66,93** |
| **12,00** | 205 | 128 | 1 | 71990 | **66,93** |
| **12,50** | 205 | 134 | 1 | 71993 | **72,22** |
| **13,00** | 205 | 134 | 1 | 71996 | **72,22** |
| **14,00** | 214 | 140 | 1 | 72002 | **77,89** |
| **15,00** | 220 | 144 | 1 | 72008 | **90,90** |
| **16,00** | 227 | 149 | 1 | 72014 | **99,68** |
| **17,00** | 235 | 154 | 1 | 72017 | **119,81** |
| **18,00** | 241 | 158 | 1 | 72020 | **119,81** |
| **19,00** | 247 | 162 | 1 | 72023 | **133,79** |
| **20,00** | 254 | 166 | 1 | 72026 | **181,07** |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02.

# TALADRADO
# PMX - HSSE - HSS

PMX - HSSE - HSS Drilling

Perçage PMX - HSSE - HSS


**BROCAS MANGO CILÍNDRICO**
Straight Shank Drill Bits
Forets queue cylindrique 74

**JUEGOS BROCAS**
Drill Bit Sets
Jeux forets 114

**BROCAS MANGO CÓNICO**
Morse Taper Shank Drill Bits
Forets queue cône morse 126

**BROCAS CENTRAR**
Center Drills
Forets â centrer 135

**BROCAS ESCARIADORES 3 CORTES**
3 Cut Core Drills
Forets aléseurs 3 lèvres 142

**BROCAS BIDIAMETRALES**
Subland Drill Bits
Forets etagés 144

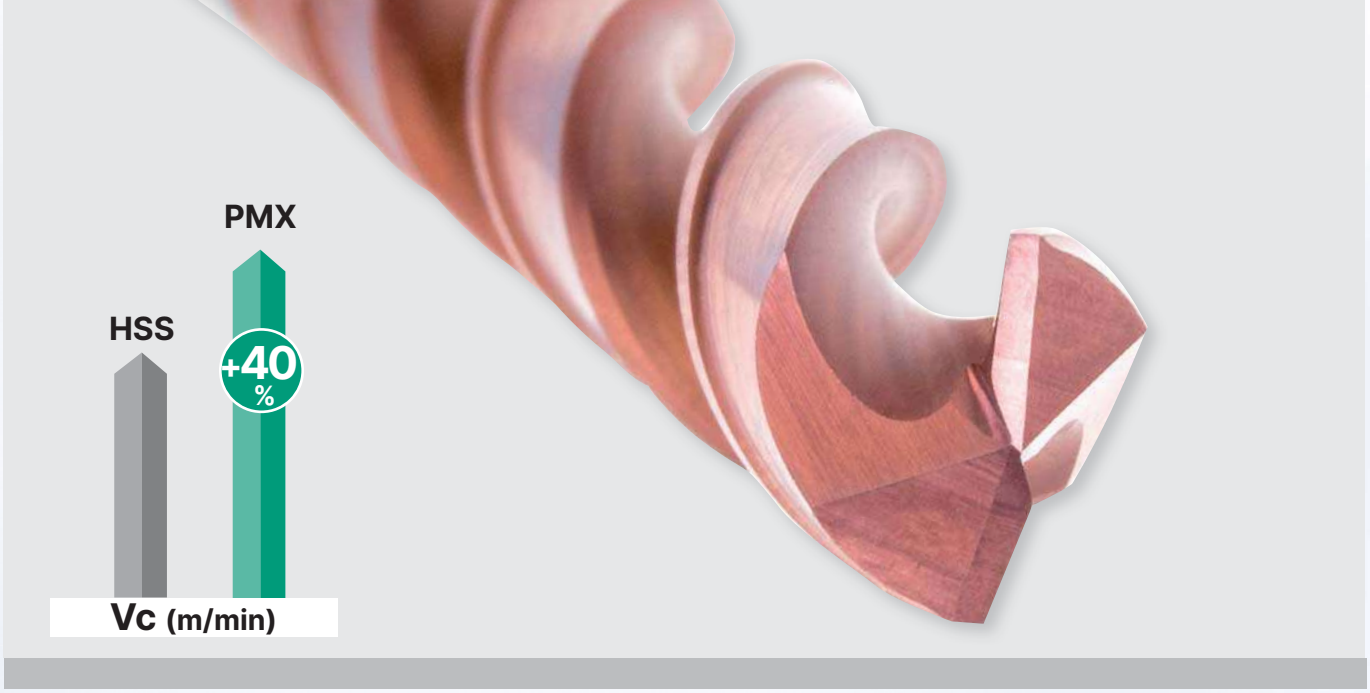
**BROCAS ESPECIALES**
Special Drills
Forets spéciaux 147

**FRESAS HUECAS M. ELECTROMAGNÉTICAS**
Annular Cutter Core Drills
Fraises à carotter UP électromagnétiques 154

**PORTABROCAS ALTA PRECISIÓN**
High Precision Drill Chucks
Mandrins precision 166

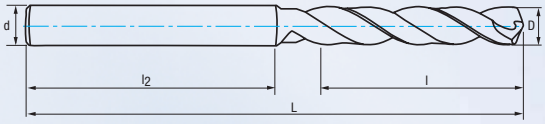
**ACCESORIOS TALADRADO**
Drilling Accessories
Accesoires perçage 169

**MAQUINAS AFILADORAS**
Sharpening Machines
Machines affûteuses 172

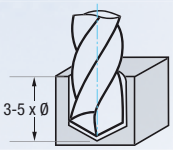



# Ref. 6016

**BROCA PMX ALTO RENDIMIENTO INOX / MATERIALES DUROS**
Stainless / Hard Materials High Performance PMX Drill Bit
Foret PMX haut rendement Inox / Matériaux durs



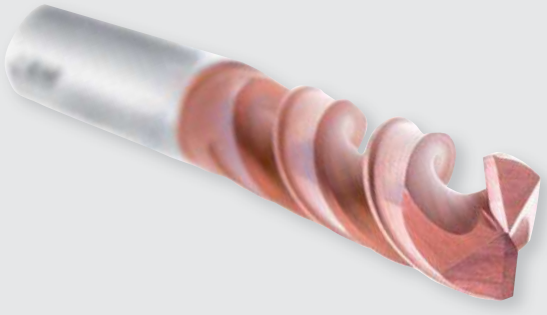

PMX | X-AlCr | IZAR Std. N | 138° | **Rectificado Ground** Taillé meulé | **Especial / Special / Spéciale Inox AISI 304 Stainless Steel** | Tol. D h8




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | X-AlCr | Ø 2 | Ø3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| P | P.1 | 30-50 | 0,060 | 0,100 | 0,120 | 0,120 | 0,160 | 0,200 | 0,250 | 0,250 |
| | P.2 | 30-45 | 0,050 | 0,060 | 0,100 | 0,100 | 0,120 | 0,160 | 0,200 | 0,200 |
| | P.3 | 25-35 | 0,030 | 0,050 | 0,060 | 0,060 | 0,080 | 0,100 | 0,120 | 0,120 |
| | P.5 | 15-20 | 0,030 | 0,050 | 0,060 | 0,060 | 0,080 | 0,100 | 0,120 | 0,120 |
| M | | 10-18 | 0,030 | 0,050 | 0,060 | 0,060 | 0,080 | 0,100 | 0,120 | 0,120 |
| K | K.1 | 35-45 | 0,080 | 0,100 | 0,160 | 0,160 | 0,200 | 0,250 | 0,300 | 0,300 |
| | K.2 | 30-40 | 0,080 | 0,100 | 0,160 | 0,160 | 0,200 | 0,250 | 0,300 | 0,300 |
| N | N.1 | 80-100 | 0,050 | 0,080 | 0,100 | 0,100 | 0,120 | 0,160 | 0,200 | 0,200 |
| | N.2 | 50-60 | 0,050 | 0,080 | 0,100 | 0,100 | 0,120 | 0,160 | 0,200 | 0,200 |
| | N.7 | 20-35 | 0,040 | 0,060 | 0,080 | 0,080 | 0,100 | 0,120 | 0,160 | 0,160 |



# Ref. 6016

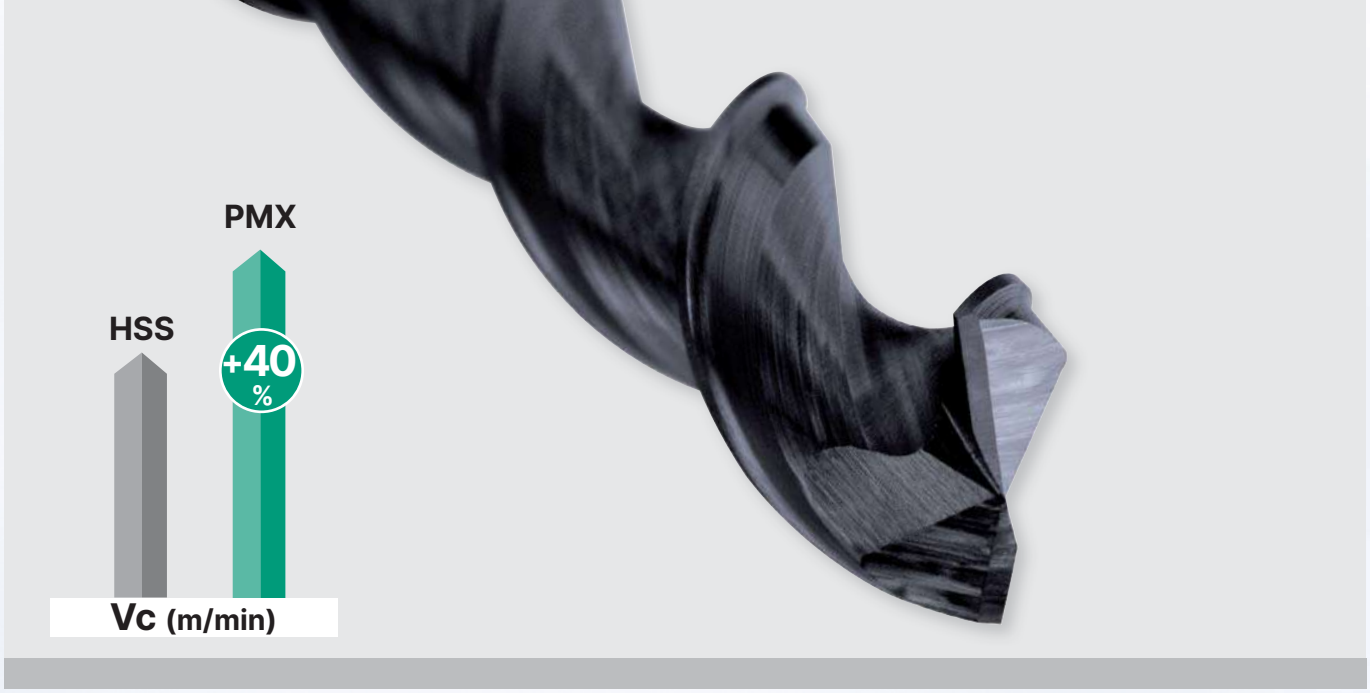
## BROCA PMX ALTO RENDIMIENTO INOX / MATERIALES DUROS
Stainless / Hard Materials High Performance PMX Drill Bit
Foret PMX haut rendement Inox / Matériaux durs

| D mm | d mm | L mm | l mm | l2 mm | | N° Art. X-AlCr | € |
|---|---|---|---|---|---|---|---|
| **2,00** | 3,00 | 46 | 15 | 28 | 1 | 59563 | **16,70** |
| **2,10** | 3,00 | 46 | 15 | 28 | 1 | 59564 | **16,70** |
| **2,20** | 3,00 | 46 | 15 | 28 | 1 | 59565 | **16,70** |
| **2,30** | 3,00 | 46 | 15 | 28 | 1 | 59566 | **16,70** |
| **2,50** | 3,00 | 46 | 15 | 28 | 1 | 59567 | **16,70** |
| **2,60** | 3,00 | 50 | 19 | 28 | 1 | 59569 | **16,70** |
| **2,80** | 3,00 | 50 | 19 | 28 | 1 | 59570 | **16,70** |
| **2,90** | 3,00 | 50 | 19 | 28 | 1 | 59571 | **16,70** |
| **3,00** | 3,00 | 50 | 19 | 28 | 1 | 59573 | **16,70** |
| **3,20** | 4,00 | 55 | 23 | 28 | 1 | 59574 | **18,23** |
| **3,30** | 4,00 | 55 | 23 | 28 | 1 | 59575 | **18,23** |
| **3,40** | 4,00 | 55 | 23 | 28 | 1 | 59578 | **18,23** |
| **3,50** | 4,00 | 55 | 23 | 28 | 1 | 59579 | **18,23** |
| **3,70** | 4,00 | 61 | 29 | 28 | 1 | 59582 | **18,23** |
| **3,80** | 4,00 | 61 | 29 | 28 | 1 | 59583 | **18,23** |
| **3,90** | 4,00 | 61 | 29 | 28 | 1 | 59584 | **18,23** |
| **4,00** | 4,00 | 61 | 29 | 28 | 1 | 59585 | **18,89** |
| **4,20** | 6,00 | 72 | 30 | 36 | 1 | 59586 | **23,60** |
| **4,30** | 6,00 | 72 | 30 | 36 | 1 | 59587 | **23,60** |
| **4,50** | 6,00 | 72 | 30 | 36 | 1 | 59593 | **23,60** |
| **4,60** | 6,00 | 75 | 33 | 36 | 1 | 59596 | **23,60** |
| **4,80** | 6,00 | 75 | 33 | 36 | 1 | 59597 | **23,60** |
| **4,90** | 6,00 | 75 | 33 | 36 | 1 | 59598 | **23,60** |
| **5,00** | 6,00 | 75 | 33 | 36 | 1 | 59599 | **31,48** |
| **5,10** | 6,00 | 75 | 33 | 36 | 1 | 59600 | **31,48** |
| **5,30** | 6,00 | 75 | 33 | 36 | 1 | 59601 | **31,48** |
| **5,50** | 6,00 | 75 | 33 | 36 | 1 | 59602 | **31,48** |
| **5,80** | 6,00 | 79 | 37 | 36 | 1 | 59603 | **31,48** |
| **5,90** | 6,00 | 79 | 37 | 36 | 1 | 59604 | **31,48** |
| **6,00** | 6,00 | 79 | 37 | 36 | 1 | 59605 | **31,48** |
| **6,30** | 8,00 | 83 | 39 | 36 | 1 | 59606 | **40,87** |
| **6,40** | 8,00 | 83 | 39 | 36 | 1 | 59607 | **40,87** |
| **6,50** | 8,00 | 83 | 39 | 36 | 1 | 59608 | **40,87** |
| **6,80** | 8,00 | 88 | 44 | 36 | 1 | 59609 | **40,87** |

| D mm | d mm | L mm | l mm | l2 mm | | N° Art. X-AlCr | € |
|---|---|---|---|---|---|---|---|
| **6,90** | 8,00 | 88 | 44 | 36 | 1 | 59738 | **40,87** |
| **7,00** | 8,00 | 88 | 44 | 36 | 1 | 59610 | **40,87** |
| **7,40** | 8,00 | 88 | 44 | 36 | 1 | 59611 | **40,87** |
| **7,50** | 8,00 | 88 | 44 | 36 | 1 | 59612 | **40,87** |
| **7,80** | 8,00 | 92 | 48 | 36 | 1 | 59613 | **40,87** |
| **7,90** | 8,00 | 92 | 48 | 36 | 1 | 59702 | **40,87** |
| **8,00** | 8,00 | 92 | 48 | 36 | 1 | 59520 | **40,87** |
| **8,50** | 10,00 | 98 | 48 | 40 | 1 | 59703 | **53,44** |
| **8,60** | 10,00 | 101 | 51 | 40 | 1 | 59704 | **53,44** |
| **8,80** | 10,00 | 101 | 51 | 40 | 1 | 59705 | **53,44** |
| **8,90** | 10,00 | 101 | 51 | 40 | 1 | 59706 | **53,44** |
| **9,00** | 10,00 | 101 | 51 | 40 | 1 | 59707 | **53,44** |
| **9,30** | 10,00 | 101 | 51 | 40 | 1 | 59708 | **53,44** |
| **9,40** | 10,00 | 101 | 51 | 40 | 1 | 59709 | **53,44** |
| **9,50** | 10,00 | 101 | 51 | 40 | 1 | 59710 | **53,44** |
| **9,80** | 10,00 | 105 | 55 | 40 | 1 | 59711 | **53,44** |
| **9,90** | 10,00 | 105 | 55 | 40 | 1 | 59712 | **53,44** |
| **10,00** | 10,00 | 105 | 55 | 40 | 1 | 59713 | **53,44** |
| **10,20** | 12,00 | 112 | 55 | 45 | 1 | 59714 | **66,03** |
| **10,30** | 12,00 | 112 | 55 | 45 | 1 | 59716 | **66,03** |
| **10,50** | 12,00 | 112 | 55 | 45 | 1 | 59718 | **66,03** |
| **10,80** | 12,00 | 116 | 59 | 45 | 1 | 59719 | **66,03** |
| **10,90** | 12,00 | 116 | 59 | 45 | 1 | 59720 | **66,03** |
| **11,00** | 12,00 | 116 | 59 | 45 | 1 | 59721 | **75,47** |
| **11,10** | 12,00 | 116 | 59 | 45 | 1 | 59722 | **75,47** |
| **11,50** | 12,00 | 116 | 59 | 45 | 1 | 59723 | **81,77** |
| **11,80** | 12,00 | 121 | 64 | 45 | 1 | 59724 | **81,77** |
| **11,90** | 12,00 | 121 | 64 | 45 | 1 | 59725 | **81,77** |
| **12,00** | 12,00 | 121 | 64 | 45 | 1 | 59726 | **81,77** |
| **12,20** | 14,00 | 129 | 70 | 45 | 1 | 59727 | **88,04** |
| **12,50** | 14,00 | 129 | 70 | 45 | 1 | 59728 | **88,04** |
| **12,70** | 14,00 | 129 | 70 | 45 | 1 | 59729 | **88,04** |
| **12,80** | 14,00 | 129 | 70 | 45 | 1 | 59730 | **88,04** |
| **12,90** | 14,00 | 129 | 70 | 45 | 1 | 59731 | **88,04** |
| **13,00** | 14,00 | 129 | 70 | 45 | 1 | 59732 | **88,04** |

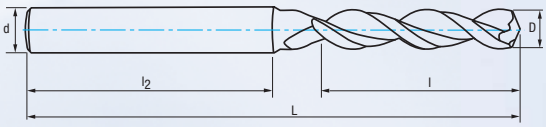
### Set 8 Pcs

| Cont. Ø | N° Art. X-AlCr | € |
|---|---|---|
| **3 - 3,3 - 4 - 4,2 5 - 6 - 6,8 - 8** | 74871 | Set Price! **211,01** |




# Ref. 6000

## BROCA PMX ALTO RENDIMIENTO TITANIO / ALEACIONES ESPECIALES
Titanium / Special Alloys High Performance PMX Drill Bit
Foret PMX haut rendement Titane / Alliages spéciaux

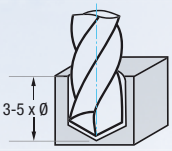



PMX | NITREX | IZAR Std. | 138° | Especial / Special / Spéciale Titanio/Titanium/Titane Ti6Al4V Nimonic, Hastelloy, Inconel | Tol. D h8

**Filo Corregido Convex Edge** Filets Corrigés

**Perfil Profile** Profil **"S"**

**Rectificado Ground** Taillé meulé




| Material Grupo | | Vc (m/min) NITREX | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ø 2 | Ø3 | Ø 4 | Ø 5 | Ø6 | Ø 8 | Ø 10 | Ø 12 |
| S | | 6-14 | 0,020 | 0,030 | 0,040 | 0,050 | 0,070 | 0,100 | 0,100 | 0,120 |
| N | N.3 | 100-120 | 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 |
| | N.4 | | 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 |
| | N.5 | | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

**Hélice forma "S":**
- **Taladrado más rápido y estable.**
- **Agujeros con buen acabado y gran precisión.**

**"S" Form Helix:**
- **Faster and more stable Drilling.**
- **High precision and good finishing holes.**

Helix form "S":
- Plus rapide et stable perçage.
- Trous de précision et de bonne finition.

**Filo corregido tipo "Convex":**
- **Afilado especial de gran precisión.**
- **Mejora el acabado superficial del mecanizado.**
- **Diseño especial para mecanizar materiales con pobre conductividad térmica como el titanio tratado Ti6Al4V.**

**"Convex" type Split Point:**
- **High Precision Special Split Point.**
- **Better Machining Surface Quality.**
- **Specially designed for machining Materials with poor Thermal Conductivity such as Ti6Al4V treated Titanium.**

"Convex" type affûtage en croix:
- Spécial affûtage en croix d'haute précision.
- S'améliore la finition de la surface.
- Conception spécial pour les matériaux avec une mauvaise conductivité thermique comme le titane traité Ti6Al4V.

# Ref. 6000

**BROCA PMX ALTO RENDIMIENTO TITANIO / ALEACIONES ESPECIALES**
Titanium / Special Alloys High Performance PMX Drill Bit
Foret PMX haut rendement Titane / Alliages spéciaux

| D mm | d mm | L mm | l mm | l2 mm | | N° Art. NITREX | € |
|---|---|---|---|---|---|---|---|
| **2,00** | 3,00 | 46 | 15 | 28 | 1 | 57450 | **16,70** |
| **2,10** | 3,00 | 46 | 15 | 28 | 1 | 58986 | **16,70** |
| **2,20** | 3,00 | 46 | 15 | 28 | 1 | 58987 | **16,70** |
| **2,30** | 3,00 | 46 | 15 | 28 | 1 | 58989 | **16,70** |
| **2,50** | 3,00 | 46 | 15 | 28 | 1 | 57451 | **16,70** |
| **2,60** | 3,00 | 50 | 19 | 28 | 1 | 58990 | **16,70** |
| **2,80** | 3,00 | 50 | 19 | 28 | 1 | 58992 | **16,70** |
| **2,90** | 3,00 | 50 | 19 | 28 | 1 | 58993 | **16,70** |
| **3,00** | 3,00 | 50 | 19 | 28 | 1 | 55623 | **16,70** |
| **3,20** | 4,00 | 55 | 23 | 28 | 1 | 57452 | **18,23** |
| **3,30** | 4,00 | 55 | 23 | 28 | 1 | 57461 | **18,23** |
| **3,40** | 4,00 | 55 | 23 | 28 | 1 | 58995 | **18,23** |
| **3,50** | 4,00 | 55 | 23 | 28 | 1 | 57462 | **18,23** |
| **3,70** | 4,00 | 61 | 29 | 28 | 1 | 58996 | **18,23** |
| **3,80** | 4,00 | 61 | 29 | 28 | 1 | 58998 | **18,23** |
| **3,90** | 4,00 | 61 | 29 | 28 | 1 | 58999 | **18,23** |
| **4,00** | 4,00 | 61 | 29 | 28 | 1 | 55626 | **18,89** |
| **4,20** | 6,00 | 72 | 30 | 36 | 1 | 57463 | **23,60** |
| **4,30** | 6,00 | 72 | 30 | 36 | 1 | 59001 | **23,60** |
| **4,50** | 6,00 | 72 | 30 | 36 | 1 | 57464 | **23,60** |
| **4,60** | 6,00 | 75 | 33 | 36 | 1 | 59002 | **23,60** |
| **4,80** | 6,00 | 75 | 33 | 36 | 1 | 59004 | **23,60** |
| **4,90** | 6,00 | 75 | 33 | 36 | 1 | 59005 | **23,60** |
| **5,00** | 6,00 | 75 | 33 | 36 | 1 | 55627 | **31,48** |
| **5,10** | 6,00 | 75 | 33 | 36 | 1 | 59007 | **31,48** |
| **5,30** | 6,00 | 75 | 33 | 36 | 1 | 59008 | **31,48** |
| **5,50** | 6,00 | 75 | 33 | 36 | 1 | 57465 | **31,48** |
| **5,80** | 6,00 | 79 | 37 | 36 | 1 | 59010 | **31,48** |
| **5,90** | 6,00 | 79 | 37 | 36 | 1 | 59011 | **31,48** |
| **6,00** | 6,00 | 79 | 37 | 36 | 1 | 55646 | **31,48** |
| **6,30** | 8,00 | 83 | 39 | 36 | 1 | 59014 | **40,87** |
| **6,40** | 8,00 | 83 | 39 | 36 | 1 | 59013 | **40,87** |
| **6,50** | 8,00 | 83 | 39 | 36 | 1 | 57466 | **40,87** |
| **6,80** | 8,00 | 88 | 44 | 36 | 1 | 57467 | **40,87** |
| **6,90** | 8,00 | 88 | 44 | 36 | 1 | 59016 | **40,87** |

| D mm | d mm | L mm | l mm | l2 mm | | N° Art. NITREX | € |
|---|---|---|---|---|---|---|---|
| **7,00** | 8,00 | 88 | 44 | 36 | 1 | 55650 | **40,87** |
| **7,40** | 8,00 | 88 | 44 | 36 | 1 | 59019 | **40,87** |
| **7,50** | 8,00 | 88 | 44 | 36 | 1 | 57469 | **40,87** |
| **7,80** | 8,00 | 92 | 48 | 36 | 1 | 59022 | **40,87** |
| **7,90** | 8,00 | 92 | 48 | 36 | 1 | 59025 | **40,87** |
| **8,00** | 8,00 | 92 | 48 | 36 | 1 | 55654 | **40,87** |
| **8,50** | 10,00 | 98 | 48 | 40 | 1 | 57470 | **53,44** |
| **8,60** | 10,00 | 101 | 51 | 40 | 1 | 59026 | **53,44** |
| **8,80** | 10,00 | 101 | 51 | 40 | 1 | 59028 | **53,44** |
| **8,90** | 10,00 | 101 | 51 | 40 | 1 | 59031 | **53,44** |
| **9,00** | 10,00 | 101 | 51 | 40 | 1 | 55656 | **53,44** |
| **9,30** | 10,00 | 101 | 51 | 40 | 1 | 59034 | **53,44** |
| **9,40** | 10,00 | 101 | 51 | 40 | 1 | 59035 | **53,44** |
| **9,50** | 10,00 | 101 | 51 | 40 | 1 | 57471 | **53,44** |
| **9,80** | 10,00 | 105 | 55 | 40 | 1 | 59037 | **53,44** |
| **9,90** | 10,00 | 105 | 55 | 40 | 1 | 59038 | **53,44** |
| **10,00** | 10,00 | 105 | 55 | 40 | 1 | 55659 | **53,44** |
| **10,20** | 12,00 | 112 | 55 | 45 | 1 | 57472 | **66,03** |
| **10,30** | 12,00 | 112 | 55 | 45 | 1 | 59040 | **66,03** |
| **10,50** | 12,00 | 112 | 55 | 45 | 1 | 57473 | **66,03** |
| **10,80** | 12,00 | 116 | 59 | 45 | 1 | 59043 | **66,03** |
| **10,90** | 12,00 | 116 | 59 | 45 | 1 | 59046 | **66,03** |
| **11,00** | 12,00 | 116 | 59 | 45 | 1 | 55660 | **75,47** |
| **11,10** | 12,00 | 116 | 59 | 45 | 1 | 59047 | **75,47** |
| **11,50** | 12,00 | 116 | 59 | 45 | 1 | 57474 | **81,77** |
| **11,80** | 12,00 | 121 | 64 | 45 | 1 | 59049 | **81,77** |
| **11,90** | 12,00 | 121 | 64 | 45 | 1 | 59050 | **81,77** |
| **12,00** | 12,00 | 121 | 64 | 45 | 1 | 55662 | **81,77** |
| **12,20** | 14,00 | 129 | 70 | 45 | 1 | 59052 | **88,04** |
| **12,50** | 14,00 | 129 | 70 | 45 | 1 | 57475 | **88,04** |
| **12,70** | 14,00 | 129 | 70 | 45 | 1 | 59055 | **88,04** |
| **12,80** | 14,00 | 129 | 70 | 45 | 1 | 59058 | **88,04** |
| **12,90** | 14,00 | 129 | 70 | 45 | 1 | 59061 | **88,04** |
| **13,00** | 14,00 | 129 | 70 | 45 | 1 | 55663 | **88,04** |

# La mejor broca de HSS Co del mercado*

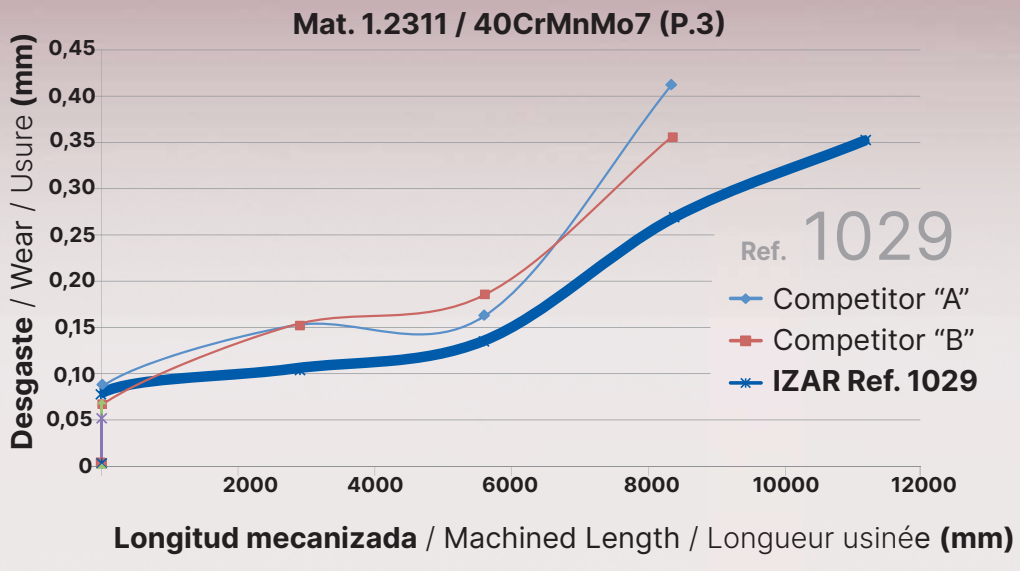
**Broca de Cobalto especial para Materiales Duros, Inoxidables y Fundición**

# The best HSS Co drill bit on the market*

Cobalt drill bit suitable for Hard materials, Stainless Steel and Cast Iron

# Le meilleur foret HSS Co du marché*

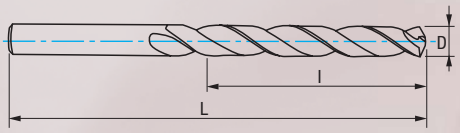
Foret cobalt spécial pour matériaux durs, inox et fonté




*** Testado contra las marcas más conocidas del mercado**
* Comparative test against well-known brands in the market
* Testé contre les marques les plus connues du marché

# Ref. 1029

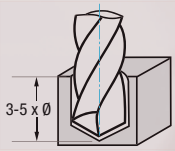
## BROCA MANGO CILÍNDRICO MULTI ACERO
Multi-Steel Straight Shank Drill Bit
Foret multi-acier queue cylindrique




HSSE 5%Co | BORDEAUX | DIN 338 N | 135° | **Rectificado Ground** Taillé meulé

A.R.I.* * **Alto Rendimiento Intensivo**
I.H.P.* * Intensive High Performance
H.P.I.* * Haute Performance Intensif

Tol. D h8




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

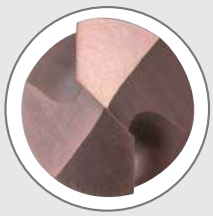
| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | BORDEAUX | Ø 2 | Ø3 | Ø 4 | Ø 5 | Ø6 | Ø 8 | Ø 10 | Ø 12 |
| P | P.3 | 10-18 | 0,030 | 0,050 | 0,060 | 0,060 | 0,080 | 0,100 | 0,120 | 0,120 |
| | P.5 | 12-17 | 0,030 | 0,050 | 0,060 | 0,060 | 0,080 | 0,100 | 0,120 | 0,120 |
| M | | 10-18 | 0,030 | 0,050 | 0,060 | 0,060 | 0,080 | 0,100 | 0,120 | 0,120 |
| K | K.1 | 35-40 | 0,080 | 0,100 | 0,160 | 0,160 | 0,200 | 0,250 | 0,300 | 0,300 |
| | K.2 | 25-30 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 |

| D mm | L mm | l mm | | N° Art. BORDEAUX | € |
|---|---|---|---|---|---|
| 1,00 | 34 | 12 | 10 | 81658 | 2,24 |
| 1,50 | 40 | 18 | 10 | 81657 | 2,18 |
| 2,00 | 49 | 24 | 10 | 79827 | 2,28 |
| 2,10 | 49 | 24 | 10 | 80672 | 2,31 |
| 2,30 | 53 | 27 | 10 | 80674 | 2,33 |
| 2,50 | 57 | 30 | 10 | 80513 | 2,07 |
| 2,70 | 61 | 33 | 10 | 80724 | 2,29 |
| 2,75 | 61 | 33 | 10 | 80726 | 2,28 |
| 3,00 | 61 | 33 | 10 | 80711 | 2,04 |
| 3,10 | 65 | 36 | 10 | 80712 | 2,57 |
| 3,20 | 65 | 36 | 10 | 80715 | 2,57 |
| 3,25 | 65 | 36 | 10 | 80716 | 2,57 |
| 3,30 | 65 | 36 | 10 | 80717 | 2,57 |
| 3,50 | 70 | 39 | 10 | 80718 | 2,55 |
| 3,60 | 70 | 39 | 10 | 80719 | 2,85 |
| 3,70 | 70 | 39 | 10 | 80720 | 2,85 |
| 3,75 | 70 | 39 | 10 | 80721 | 2,76 |
| 3,90 | 75 | 43 | 10 | 80722 | 2,84 |
| 4,00 | 75 | 43 | 10 | 80723 | 2,63 |
| 4,10 | 75 | 43 | 10 | 80727 | 2,77 |

| D mm | L mm | l mm | | N° Art. BORDEAUX | € |
|---|---|---|---|---|---|
| 4,20 | 75 | 43 | 10 | 80728 | 2,77 |
| 4,25 | 75 | 43 | 10 | 80729 | 2,77 |
| 4,30 | 80 | 47 | 10 | 80731 | 2,78 |
| 4,40 | 80 | 47 | 10 | 80732 | 2,78 |
| 4,50 | 80 | 47 | 10 | 80733 | 2,80 |
| 4,70 | 80 | 47 | 10 | 80734 | 3,01 |
| 4,75 | 80 | 47 | 10 | 80735 | 2,92 |
| 4,80 | 86 | 52 | 10 | 80736 | 3,00 |
| 5,00 | 86 | 52 | 10 | 80737 | 2,86 |
| 5,10 | 86 | 52 | 10 | 80738 | 3,06 |
| 5,20 | 86 | 52 | 10 | 80739 | 3,13 |
| 5,25 | 86 | 52 | 10 | 80740 | 3,10 |
| 5,30 | 86 | 52 | 10 | 80741 | 3,13 |
| 5,50 | 93 | 57 | 10 | 80742 | 3,24 |
| 5,60 | 93 | 57 | 10 | 80744 | 3,59 |
| 5,75 | 93 | 57 | 10 | 80745 | 3,47 |
| 5,80 | 93 | 57 | 10 | 80746 | 3,59 |
| 5,90 | 93 | 57 | 10 | 80748 | 3,59 |
| 6,00 | 93 | 57 | 10 | 80749 | 3,34 |
| 6,20 | 101 | 63 | 10 | 80750 | 6,40 |

| | D mm | L mm | l mm | | N° Art. BORDEAUX | € |
|---|---|---|---|---|---|---|
| | 6,50 | 101 | 63 | 10 | 80751 | 6,18 |
| | 6,80 | 109 | 69 | 10 | 80752 | 6,55 |
| | 7,00 | 109 | 69 | 10 | 80753 | 6,54 |
| | 7,20 | 109 | 69 | 10 | 80754 | 7,69 |
| New! | 7,30 | 109 | 69 | 10 | 25277 | 7,69 |
| | 7,50 | 109 | 69 | 10 | 80755 | 6,71 |
| | 8,00 | 117 | 75 | 10 | 80756 | 7,14 |
| | 8,20 | 117 | 75 | 10 | 80757 | 8,23 |
| | 8,50 | 117 | 75 | 10 | 80758 | 7,96 |
| | 8,80 | 125 | 81 | 10 | 80759 | 10,01 |
| | 9,00 | 125 | 81 | 10 | 80760 | 8,83 |
| | 9,50 | 125 | 81 | 10 | 80761 | 8,98 |
| | 9,80 | 133 | 87 | 10 | 80762 | 11,67 |
| | 10,00 | 133 | 87 | 10 | 80763 | 9,41 |
| | 10,20 | 133 | 87 | 5 | 80764 | 16,23 |
| | 10,50 | 133 | 87 | 5 | 80765 | 16,23 |
| | 11,00 | 142 | 94 | 5 | 80766 | 16,91 |
| | 11,50 | 142 | 94 | 5 | 80767 | 17,94 |
| | 12,00 | 151 | 101 | 5 | 80768 | 18,55 |
| | 12,50 | 151 | 101 | 5 | 81656 | 22,93 |
| | 13,00 | 151 | 101 | 5 | 80769 | 23,31 |

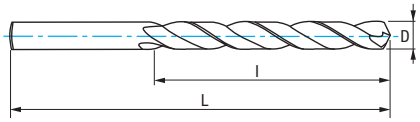
- **Recubrimiento de alto rendimiento con la última tecnología**
- **Geometría multi-material con una alta durabilidad en todo tipo de Aceros, Inox, Fundición...**
- **State-of-the-art technology coating for a higher performance**
- **Multi-material geometry, obtaining long durability in all types of Steel, Inox, Cast Iron...**
- Revêtement de dernière technologie pour une performance supérieure
- Géométrie multi-matériaux, obtenant une longue durée de vie dans tous les types d'Acier, Inox, Fonte...



# Ref. 1016

PROFESSIONAL

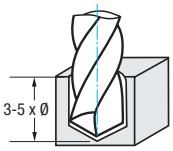
## BROCA MANGO CILÍNDRICO MATERIALES DUROS. SERIE CORTA
Hard Materials Straight Shank Drill Bit. Jobber Series
Foret queue cylindrique matériaux durs. Série courte




| HSSE 5%Co | HSSE 5%Co + TIALSIN | DIN 338 N | 135° | DIN 1412 C ≥ 2 mm | | | Ambar Gold Finish Finition Or | Rectificado Ground Taillé meulé | A.R.I.* Alto Rendimiento Intensivo<br>I.H.P.* Intensive High Performance<br>H.P.I.* Haute Performance Intensif | Tol. D h8 |
|---|---|---|---|---|---|---|---|---|---|---|

**x3,5** Resistencia al desgaste
Wear Resistance
Résistant à l'usure

Video




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x f**

| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | 5% Co | TIALSIN |
| P | P.3 | 8-15 | 12-20 |
| | P.5 | 8-12 | 12-17 |
| S | | 10-15 | 14-20 |

| Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| 0,020 | 0,035 | 0,045 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 | 0,160 |
| 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 | 0,150 | 0,170 |
| 0,020 | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 |

| D mm | L mm | l mm | | N° Art. 5% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|
| 0,50 | 22 | 6 | 10 | 37442 | 1,98 | | |
| 0,60 | 27 | 7 | 10 | 37443 | 2,52 | | |
| 0,70 | 28 | 9 | 10 | 37444 | 2,52 | | |
| 0,75 | 28 | 9 | 10 | 37445 | 1,80 | | |
| 0,80 | 30 | 10 | 10 | 37446 | 1,88 | | |
| 0,90 | 32 | 11 | 10 | 37447 | 1,88 | | |
| 1,00 | 34 | 12 | 10 | 27309 | 1,45 | 12897 | 2,97 |
| 1,10 | 36 | 14 | 10 | 20107 | 1,79 | 17722 | 3,35 |
| 1,20 | 38 | 16 | 10 | 28861 | 1,78 | 17723 | 3,31 |
| 1,25 | 38 | 16 | 10 | 20112 | 1,72 | 17724 | 3,22 |
| 1,30 | 38 | 16 | 10 | 20116 | 1,78 | 17725 | 3,31 |
| 1,40 | 40 | 18 | 10 | 20125 | 1,78 | 17726 | 3,31 |
| 1,50 | 40 | 18 | 10 | 27170 | 1,40 | 12898 | 2,90 |
| 1,60 | 43 | 20 | 10 | 20133 | 1,78 | 17727 | 3,34 |
| 1,70 | 43 | 20 | 10 | 20142 | 1,78 | 17728 | 3,31 |
| 1,75 | 46 | 22 | 10 | 20146 | 1,72 | 17729 | 3,22 |
| 1,80 | 46 | 22 | 10 | 20151 | 1,78 | 17730 | 3,31 |
| 1,90 | 46 | 22 | 10 | 20155 | 1,78 | 17731 | 3,34 |
| 2,00 | 49 | 24 | 10 | 19247 | 1,44 | 12899 | 3,03 |
| 2,10 | 49 | 24 | 10 | 20161 | 1,70 | 17732 | 3,08 |
| 2,20 | 53 | 27 | 10 | 20166 | 1,70 | 17734 | 3,08 |
| 2,25 | 53 | 27 | 10 | 20170 | 1,63 | 17735 | 3,04 |
| 2,30 | 53 | 27 | 10 | 20175 | 1,70 | 17736 | 3,11 |
| 2,40 | 57 | 30 | 10 | 20184 | 1,70 | 17737 | 3,11 |
| 2,50 | 57 | 30 | 10 | 19251 | 1,32 | 12900 | 2,75 |
| 2,60 | 57 | 30 | 10 | 20199 | 1,65 | 17738 | 3,05 |
| 2,65 | 57 | 30 | 10 | 80109 | 1,65 | | |
| 2,70 | 61 | 33 | 10 | 20203 | 1,65 | 17739 | 3,05 |
| 2,75 | 61 | 33 | 10 | 19262 | 1,63 | 17740 | 3,04 |
| 2,80 | 61 | 33 | 10 | 20209 | 1,65 | 17741 | 3,06 |
| 2,90 | 61 | 33 | 10 | 20214 | 1,65 | 17742 | 3,06 |
| 3,00 | 61 | 33 | 10 | 19256 | 1,30 | 12901 | 2,70 |
| 3,05 | 65 | 36 | 10 | 79847 | 1,76 | | |
| 3,10 | 65 | 36 | 10 | 20220 | 1,58 | 12882 | 3,41 |
| 3,15 | 65 | 36 | 10 | 79848 | 1,76 | | |
| 3,20 | 65 | 36 | 10 | 20224 | 1,58 | 17226 | 3,41 |
| 3,25 | 65 | 36 | 10 | 19259 | 1,58 | 12883 | 3,41 |
| 3,30 | 65 | 36 | 10 | 20230 | 1,58 | 12884 | 3,41 |
| 3,40 | 70 | 39 | 10 | 20235 | 1,65 | 12885 | 3,54 |
| 3,50 | 70 | 39 | 10 | 19268 | 1,57 | 12902 | 3,40 |
| 3,60 | 70 | 39 | 10 | 20241 | 1,98 | 17743 | 3,79 |
| 3,70 | 70 | 39 | 10 | 20245 | 1,98 | 17744 | 3,79 |

| D mm | L mm | l mm | | N° Art. 5% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|
| 3,75 | 70 | 39 | 10 | 19269 | 1,84 | | |
| 3,80 | 75 | 43 | 10 | 20251 | 1,98 | 17746 | 3,79 |
| 3,90 | 75 | 43 | 10 | 20256 | 1,98 | 17748 | 3,79 |
| 4,00 | 75 | 43 | 10 | 19286 | 1,66 | 12903 | 3,51 |
| 4,05 | 75 | 43 | 10 | 18949 | 2,07 | | |
| 4,10 | 75 | 43 | 10 | 20265 | 1,84 | 12886 | 3,68 |
| 4,15 | 75 | 43 | 10 | 65326 | 2,07 | | |
| 4,20 | 75 | 43 | 10 | 20269 | 1,84 | 12887 | 3,68 |
| 4,25 | 75 | 43 | 10 | 19271 | 1,84 | 12888 | 3,68 |
| 4,30 | 80 | 47 | 10 | 20278 | 1,98 | 12931 | 3,71 |
| 4,40 | 80 | 47 | 10 | 20283 | 1,98 | 17749 | 3,71 |
| 4,50 | 80 | 47 | 10 | 19274 | 1,92 | 12904 | 3,72 |
| 4,60 | 80 | 47 | 10 | 20289 | 2,19 | 17750 | 4,00 |
| 4,70 | 80 | 47 | 10 | 20293 | 2,19 | 17752 | 4,01 |
| 4,75 | 80 | 47 | 10 | 20298 | 2,07 | 17753 | 3,89 |
| 4,80 | 86 | 52 | 10 | 20302 | 2,19 | 17754 | 4,00 |
| 4,90 | 86 | 52 | 10 | 20311 | 2,19 | 17755 | 4,00 |
| 5,00 | 86 | 52 | 10 | 19277 | 2,00 | 12905 | 3,82 |
| 5,05 | 86 | 52 | 10 | 76128 | 2,67 | | |
| 5,10 | 86 | 52 | 10 | 20320 | 2,38 | 12891 | 4,08 |
| 5,15 | 86 | 52 | 10 | 79849 | 2,67 | | |
| 5,20 | 86 | 52 | 10 | 20328 | 2,38 | 17757 | 4,18 |
| 5,25 | 86 | 52 | 10 | 19280 | 2,36 | 12893 | 4,12 |
| 5,30 | 86 | 52 | 10 | 20340 | 2,38 | 17756 | 4,18 |
| 5,40 | 93 | 57 | 10 | 20349 | 2,38 | 17758 | 4,18 |
| 5,50 | 93 | 57 | 10 | 19290 | 2,52 | 12906 | 4,31 |
| 5,60 | 93 | 57 | 10 | 20361 | 3,01 | 17759 | 4,79 |
| 5,70 | 93 | 57 | 10 | 20370 | 3,01 | 17760 | 4,79 |
| 5,75 | 93 | 57 | 10 | 20379 | 2,84 | | |
| 5,80 | 93 | 57 | 10 | 20388 | 3,01 | 17762 | 4,79 |
| 5,90 | 93 | 57 | 10 | 20397 | 3,01 | 17763 | 4,79 |
| 6,00 | 93 | 57 | 10 | 19301 | 2,71 | 12907 | 4,45 |
| 6,05 | 101 | 63 | 10 | 79855 | 3,75 | | |
| 6,10 | 101 | 63 | 10 | 20415 | 3,34 | 17764 | 8,54 |
| 6,15 | 101 | 63 | 10 | 79856 | 3,75 | | |
| 6,20 | 101 | 63 | 10 | 20424 | 3,34 | 17765 | 8,54 |
| 6,25 | 101 | 63 | 10 | 20433 | 3,15 | | |
| 6,30 | 101 | 63 | 10 | 20442 | 3,34 | 17767 | 8,54 |
| 6,35 | 101 | 63 | 10 | 79858 | 3,34 | | |
| 6,40 | 101 | 63 | 10 | 20451 | 3,34 | 17768 | 8,54 |
| 6,45 | 101 | 63 | 10 | 64140 | 3,34 | | |
| 6,50 | 101 | 63 | 10 | 27290 | 3,22 | 12908 | 8,25 |

Ref. 1016
PROFESSIONAL

# BROCA MANGO CILÍNDRICO MATERIALES DUROS. SERIE CORTA
## Hard Materials Straight Shank Drill Bit. Jobber Series
## Foret queue cylindrique matériaux durs. Série courte

| D mm | L mm | l mm | | N° Art. 5% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|
| **6,60** | 101 | 63 | 10 | 20466 | **4,01** | 17769 | **8,97** |
| **6,70** | 101 | 63 | 10 | 20475 | **4,01** | 17770 | **8,97** |
| **6,75** | 109 | 69 | 10 | 20481 | **3,77** | 12894 | **8,72** |
| **6,80** | 109 | 69 | 10 | 20488 | **3,77** | 12895 | **8,72** |
| **6,90** | 109 | 69 | 10 | 20493 | **4,01** | 17771 | **9,19** |
| **7,00** | 109 | 69 | 10 | 19305 | **3,52** | 12909 | **8,71** |
| **7,10** | 109 | 69 | 10 | 20499 | **5,10** | 17773 | **10,24** |
| **7,20** | 109 | 69 | 10 | 20503 | **5,10** | 17774 | **10,24** |
| **7,25** | 109 | 69 | 10 | 20508 | **4,79** | | |
| **7,30** | 109 | 69 | 10 | 20512 | **5,10** | 17776 | **10,24** |
| **7,40** | 109 | 69 | 10 | 20517 | **5,10** | 17777 | **10,24** |
| **7,50** | 109 | 69 | 10 | 19292 | **3,77** | 12910 | **8,94** |
| **7,60** | 117 | 75 | 10 | 20523 | **6,16** | 17778 | **11,25** |
| **7,70** | 117 | 75 | 10 | 20527 | **6,16** | 17779 | **11,25** |
| **7,75** | 117 | 75 | 10 | 20532 | **5,81** | | |
| **7,80** | 117 | 75 | 10 | 20536 | **6,16** | 17781 | **11,25** |
| **7,90** | 117 | 75 | 10 | 20541 | **6,16** | 17782 | **11,25** |
| **8,00** | 117 | 75 | 10 | 20208 | **4,41** | 12911 | **9,53** |
| **8,10** | 117 | 75 | 10 | 22734 | **5,87** | 17783 | **10,96** |
| **8,20** | 117 | 75 | 10 | 22737 | **5,87** | 17784 | **10,96** |
| **8,25** | 117 | 75 | 10 | 22740 | **5,54** | | |
| **8,30** | 117 | 75 | 10 | 22743 | **5,87** | 17786 | **11,87** |
| **8,40** | 117 | 75 | 10 | 22746 | **5,87** | 17787 | **10,96** |
| **8,50** | 117 | 75 | 10 | 19298 | **4,57** | 12912 | **10,62** |
| **8,60** | 125 | 81 | 10 | 22752 | **7,48** | 17788 | **13,33** |
| **8,70** | 125 | 81 | 10 | 22755 | **7,48** | 17789 | **13,33** |
| **8,75** | 125 | 81 | 10 | 22758 | **7,07** | | |
| **8,80** | 125 | 81 | 10 | 22761 | **7,48** | 17791 | **13,33** |
| **8,90** | 125 | 81 | 10 | 22764 | **7,48** | 17792 | **13,33** |
| **9,00** | 125 | 81 | 10 | 20358 | **5,84** | 12914 | **11,77** |
| **9,10** | 125 | 81 | 10 | 22768 | **8,29** | 17794 | **14,14** |
| **9,20** | 125 | 81 | 10 | 22771 | **8,29** | 17795 | **14,14** |
| **9,25** | 125 | 81 | 10 | 22774 | **7,80** | | |
| **9,30** | 125 | 81 | 10 | 22777 | **8,29** | 17797 | **14,14** |
| **9,40** | 125 | 81 | 10 | 22780 | **8,29** | 17798 | **14,14** |
| **9,50** | 125 | 81 | 10 | 20545 | **6,07** | 12915 | **11,96** |
| **9,60** | 133 | 87 | 10 | 22784 | **9,75** | 17799 | **15,55** |
| **9,70** | 133 | 87 | 10 | 23567 | **9,75** | 17800 | **15,55** |
| **9,75** | 133 | 87 | 10 | 26697 | **9,20** | | |
| **9,80** | 133 | 87 | 10 | 26809 | **9,75** | 17802 | **15,55** |
| **9,90** | 133 | 87 | 10 | 27121 | **9,75** | 17803 | **15,55** |
| **10,00** | 133 | 87 | 10 | 27291 | **6,67** | 12917 | **12,55** |
| **10,10** | 133 | 87 | 5 | 27318 | **11,20** | | |
| **10,20** | 133 | 87 | 5 | 27541 | **9,45** | 12896 | **21,62** |
| **10,25** | 133 | 87 | 5 | 27544 | **11,62** | 17805 | **23,73** |
| **10,30** | 133 | 87 | 5 | 27585 | **11,20** | 17806 | **23,28** |
| **10,40** | 133 | 87 | 5 | 27682 | **11,20** | 17807 | **23,28** |
| **10,50** | 133 | 87 | 5 | 27685 | **9,45** | 12918 | **21,62** |
| **10,60** | 133 | 87 | 5 | 27690 | **13,03** | | |

| | D mm | L mm | l mm | | N° Art. 5% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| | **10,70** | 142 | 94 | 5 | 27693 | **13,03** | | |
| | **10,75** | 142 | 94 | 5 | 27696 | **13,51** | | |
| | **10,80** | 142 | 94 | 5 | 27699 | **13,03** | 17812 | **24,94** |
| | **10,90** | 142 | 94 | 5 | 27702 | **13,03** | | |
| | **11,00** | 142 | 94 | 5 | 27705 | **10,43** | 12919 | **22,54** |
| | **11,10** | 142 | 94 | 5 | 27708 | **14,82** | | |
| | **11,20** | 142 | 94 | 5 | 27711 | **14,82** | | |
| | **11,25** | 142 | 94 | 5 | 27714 | **15,39** | 17816 | **26,77** |
| | **11,30** | 142 | 94 | 5 | 27717 | **14,82** | | |
| | **11,40** | 142 | 94 | 5 | 27720 | **14,82** | | |
| | **11,50** | 142 | 94 | 5 | 19307 | **12,47** | 12932 | **23,92** |
| | **11,60** | 142 | 94 | 5 | 27724 | **15,33** | | |
| | **11,70** | 142 | 94 | 5 | 27727 | **15,33** | | |
| New! | **11,75** | 142 | 94 | 5 | 27730 | **15,91** | 85706 | **27,32** |
| | **11,80** | 142 | 94 | 5 | 27733 | **15,33** | | |
| | **11,90** | 151 | 101 | 5 | 27736 | **15,33** | | |
| | **12,00** | 151 | 101 | 5 | 19311 | **13,33** | 12920 | **24,74** |
| | **12,10** | 151 | 101 | 5 | 27742 | **17,78** | | |
| | **12,20** | 151 | 101 | 5 | 27745 | **17,78** | | |
| | **12,25** | 151 | 101 | 5 | 19313 | **18,45** | | |
| | **12,30** | 151 | 101 | 5 | 27749 | **17,78** | | |
| | **12,40** | 151 | 101 | 5 | 27752 | **17,78** | | |
| | **12,50** | 151 | 101 | 5 | 27755 | **16,24** | 12921 | **30,57** |
| | **12,60** | 151 | 101 | 5 | 27758 | **18,55** | | |
| | **12,70** | 151 | 101 | 5 | 27761 | **18,55** | | |
| | **12,75** | 151 | 101 | 5 | 19316 | **19,28** | | |
| | **12,80** | 151 | 101 | 5 | 27765 | **18,55** | | |
| | **12,90** | 151 | 101 | 5 | 27768 | **18,55** | | |
| | **13,00** | 151 | 101 | 5 | 27771 | **16,63** | 12923 | **31,07** |
| | **13,25** | 160 | 108 | 1 | 27777 | **22,98** | | |
| | **13,50** | 160 | 108 | 1 | 27774 | **18,31** | 12924 | **32,63** |
| | **13,75** | 160 | 108 | 1 | 27780 | **22,98** | | |
| | **14,00** | 160 | 108 | 1 | 27783 | **18,12** | 12927 | **32,44** |
| | **14,25** | 169 | 114 | 1 | 27786 | **30,22** | | |
| | **14,50** | 169 | 114 | 1 | 27789 | **25,68** | 12929 | **39,32** |
| | **14,75** | 169 | 114 | 1 | 27792 | **30,22** | | |
| | **15,00** | 169 | 114 | 1 | 27795 | **26,08** | 12930 | **39,80** |
| | **15,25** | 178 | 120 | 1 | 27798 | **41,70** | | |
| | **15,50** | 178 | 120 | 1 | 27801 | **30,19** | 82202 | **41,04** |
| | **15,75** | 178 | 120 | 1 | 27804 | **41,70** | | |
| | **16,00** | 178 | 120 | 1 | 27807 | **31,28** | 15084 | **42,09** |
| New! | **16,50** | 184 | 125 | 1 | 27811 | **35,74** | 26752 | **48,09** |
| | **17,00** | 184 | 125 | 1 | 27814 | **35,74** | 35437 | **48,09** |
| | **17,50** | 191 | 130 | 1 | 27817 | **39,62** | 35438 | **51,86** |
| | **18,00** | 191 | 130 | 1 | 27820 | **43,14** | 15252 | **55,28** |
| New! | **18,50** | 198 | 135 | 1 | 27823 | **47,66** | 26755 | **59,67** |
| New! | **19,00** | 198 | 135 | 1 | 27826 | **47,66** | 67417 | **59,67** |
| New! | **19,50** | 205 | 140 | 1 | 27829 | **52,83** | 26757 | **64,69** |
| New! | **20,00** | 205 | 140 | 1 | 27832 | **56,60** | 26742 | **68,35** |

Ref. 1056

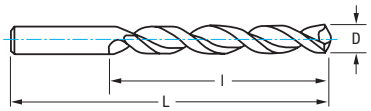
**Extra-Corta** / **Stub** / Extra-courte **Pag. 100**

Ref. 1036

**Larga** / **Long** / Longue **Pag. 107**

# Ref. 1000

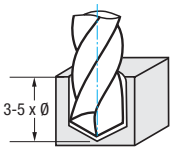
## BROCA MANGO CILÍNDRICO AGUJEROS TOL. IT8-9. SERIE CORTA
IT8-9 Tolerance Hole Straight Shank Drill Bit. Jobber Series
Foret queue cylindrique trous tolérance IT8-9. Série courte




"S"

HSSE 5%Co | HSSE 5%Co + TIALSIN | DIN 338TS | 135° | Filo Corregido Convex Edge "U" Filets Corrigés | Perfil Profile Profil "S" | Rectificado Ground Taillé meulé | Tol. D h8

5% Co | TIALSIN x3,5 — Resistencia al desgaste Wear Resistance Résistant à l'usure




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | 5% Co | TIALSIN |
| P | P.1 | 20-25 | 28-35 |
| | P.2 | 20-25 | 28-35 |
| | P.3 | 8-15 | 12-20 |
| K | K.1 | 30-35 | 36-42 |
| | K.2 | 25-30 | 30-36 |
| N | N.5 | 40-50 | 56-70 |
| | N.6 | 35-45 | 40-58 |

| Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 |
| 0,035 | 0,045 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 | 0,130 | 0,160 |
| 0,035 | 0,045 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 | 0,130 | 0,160 |
| 0,020 | 0,035 | 0,045 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 |
| 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 |
| 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 |
| 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 |
| 0,080 | 0,130 | 0,150 | 0,170 | 0,190 | 0,250 | 0,290 | 0,310 | 0,360 |

| D mm | L mm | l mm | | N° Art. 5% Co | € | | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| 2,00 | 49 | 24 | 10 | 22232 | 3,48 | 1 | 13524 | 4,99 |
| 2,10 | 49 | 24 | 10 | 14496 | 3,72 | 1 | 21550 | 5,08 |
| 2,30 | 53 | 27 | 10 | 14497 | 3,72 | 1 | 21552 | 5,08 |
| 2,50 | 57 | 30 | 10 | 22233 | 3,16 | 1 | 13527 | 4,55 |
| 2,70 | 61 | 33 | 10 | 14500 | 3,68 | 1 | 24854 | 5,02 |
| 2,75 | 61 | 33 | 10 | 14455 | 3,89 | 1 | 24855 | 5,25 |
| 3,00 | 61 | 33 | 10 | 22234 | 3,09 | 1 | 13530 | 4,45 |
| 3,10 | 65 | 36 | 10 | 14502 | 3,77 | 1 | 14599 | 5,54 |
| 3,20 | 65 | 36 | 10 | 22235 | 3,77 | 1 | 13533 | 5,54 |
| 3,25 | 65 | 36 | 10 | 14457 | 3,77 | 1 | 14479 | 5,54 |
| 3,30 | 65 | 36 | 10 | 14503 | 3,77 | 1 | 14601 | 5,54 |
| 3,50 | 70 | 39 | 10 | 22236 | 3,74 | 1 | 13536 | 5,50 |
| 3,60 | 70 | 39 | 10 | 14925 | 4,34 | 1 | 24856 | 6,10 |
| 3,70 | 70 | 39 | 10 | 14508 | 4,34 | 1 | 24857 | 6,10 |
| 3,75 | 70 | 39 | 10 | 14458 | 4,44 | 1 | 24858 | 6,19 |
| 3,90 | 75 | 43 | 10 | 14634 | 4,74 | 1 | 24859 | 6,47 |
| 4,00 | 75 | 43 | 10 | 22237 | 4,01 | 1 | 13539 | 5,78 |
| 4,10 | 75 | 43 | 10 | 14511 | 4,44 | 1 | 14605 | 6,19 |
| 4,20 | 75 | 43 | 10 | 22238 | 4,44 | 1 | 13542 | 6,19 |
| 4,25 | 75 | 43 | 10 | 14461 | 4,44 | 1 | 14482 | 6,19 |
| 4,30 | 80 | 47 | 10 | 14514 | 4,74 | 1 | 14607 | 6,66 |
| 4,40 | 80 | 47 | 10 | 14635 | 4,74 | 1 | 24860 | 6,50 |
| 4,50 | 80 | 47 | 10 | 22239 | 4,56 | 1 | 13545 | 6,32 |
| 4,70 | 80 | 47 | 10 | 14637 | 5,27 | 1 | 24861 | 7,01 |
| 4,75 | 80 | 47 | 10 | 14464 | 4,97 | 1 | 24862 | 6,72 |
| 4,80 | 86 | 52 | 10 | 14641 | 5,27 | 1 | 24863 | 7,01 |
| 5,00 | 86 | 52 | 10 | 22240 | 4,78 | 1 | 13548 | 6,53 |
| 5,10 | 86 | 52 | 10 | 22241 | 5,71 | 1 | 13551 | 7,35 |
| 5,20 | 86 | 52 | 10 | 14517 | 5,71 | 1 | 24864 | 7,43 |

| D mm | L mm | l mm | | N° Art. 5% Co | € | | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| 5,25 | 86 | 52 | 10 | 14466 | 5,67 | 1 | 14485 | 7,37 |
| 5,30 | 86 | 52 | 10 | 14643 | 5,71 | 1 | 24865 | 7,43 |
| 5,50 | 93 | 57 | 10 | 22242 | 6,07 | 1 | 13554 | 7,76 |
| 5,60 | 93 | 57 | 10 | 14646 | 7,22 | 1 | 24866 | 8,90 |
| 5,75 | 93 | 57 | 10 | 14467 | 6,81 | 1 | 24867 | 8,51 |
| 5,80 | 93 | 57 | 10 | 14523 | 7,22 | 1 | 24868 | 8,90 |
| 5,90 | 93 | 57 | 10 | 14647 | 7,22 | 1 | 24869 | 8,90 |
| 6,00 | 93 | 57 | 10 | 22243 | 6,48 | 1 | 13557 | 8,16 |
| 6,20 | 101 | 63 | 5 | 14526 | 7,99 | 1 | 24870 | 12,83 |
| 6,50 | 101 | 63 | 5 | 22244 | 7,77 | 1 | 13560 | 12,58 |
| 6,80 | 109 | 69 | 5 | 14527 | 9,04 | 1 | 14610 | 13,83 |
| 7,00 | 109 | 69 | 5 | 22245 | 8,48 | 1 | 13563 | 13,47 |
| 7,20 | 109 | 69 | 5 | 14649 | 11,94 | 1 | 24871 | 16,84 |
| 7,50 | 109 | 69 | 5 | 14529 | 9,04 | 1 | 14611 | 14,02 |
| 8,00 | 117 | 75 | 5 | 22246 | 10,57 | 1 | 13566 | 15,50 |
| 8,20 | 117 | 75 | 5 | 14533 | 14,28 | 1 | 24872 | 19,98 |
| 8,50 | 117 | 75 | 5 | 22247 | 11,00 | 1 | 13569 | 16,80 |
| 8,80 | 125 | 81 | 5 | 14653 | 17,60 | 1 | 24873 | 23,20 |
| 9,00 | 125 | 81 | 5 | 22248 | 14,04 | 1 | 13572 | 19,78 |
| 9,50 | 125 | 81 | 5 | 14535 | 14,55 | 1 | 14613 | 20,26 |
| 9,80 | 133 | 87 | 5 | 14655 | 22,06 | 1 | 24874 | 27,54 |
| 10,00 | 133 | 87 | 5 | 22249 | 15,99 | 1 | 14363 | 21,62 |
| 10,20 | 133 | 87 | 1 | 39627 | 22,62 | 1 | 62785 | 34,35 |
| 10,50 | 133 | 87 | 1 | 14659 | 22,62 | 1 | 14676 | 34,35 |
| 11,00 | 142 | 94 | 1 | 22250 | 25,03 | 1 | 14364 | 36,68 |
| 11,50 | 142 | 94 | 1 | 14664 | 29,91 | 1 | 14677 | 40,94 |
| 12,00 | 151 | 101 | 1 | 22251 | 31,99 | 1 | 14365 | 42,97 |
| New! 12,50 | 151 | 101 | 1 | 39600 | 38,98 | 1 | 62810 | 52,92 |
| 13,00 | 151 | 101 | 1 | 22252 | 39,91 | 1 | 14366 | 53,83 |

Ref. 1055 — **Extra-Corta** / **Stub** / Extra-courte — Pag. 99

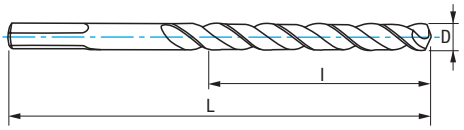
Ref. 1300 — **Larga** / **Long** / Longue — Pag. 108

Ref. 9040 — **Extra Larga** / **Extra Long** / Extra-longue — Pag. 111

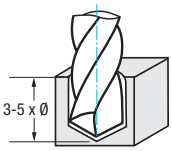
# Ref. 1021

BOROA

## BROCA MANGO CILÍNDRICO MULTI INOX. SERIE CORTA
## Multi-STAINLESS Steel Straight Shank Drill Bit. Jobber Series
## Foret queue cylindrique Multi INOX. Série courte




HSSE 5%Co | DIN 338 W | 135° | 40° | DIN 1412 C ≥ 2 mm | ≥ø4 | < 4 mm Chapa Sheets Tôle | Blue+ Gold Finish ≥ 3 mm | Tol. D h8




Video

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| P | P.1 | 30-35 | 0,045 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 |
| | P.5 | 8-12 | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 |
| M | | 6-12 | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 |
| N | N.1 | 30-40 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 |
| | N.2 | | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 |
| | N.3 | 60-80 | 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 |
| | N.4 | | 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 |
| | N.5 | 40-50 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 |

| D mm | L mm | l mm | | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| 1,00 | 34 | 12 | 10 | 25641 | 2,66 |
| 1,25 | 38 | 16 | 10 | 25642 | 3,16 |
| 1,50 | 40 | 18 | 10 | 25644 | 2,53 |
| 1,75 | 46 | 22 | 10 | 69953 | 3,16 |
| 2,00 | 49 | 24 | 10 | 25645 | 2,53 |
| 2,25 | 53 | 27 | 10 | 25646 | 2,79 |
| 2,50 | 57 | 30 | 10 | 25647 | 2,31 |
| 2,75 | 61 | 33 | 10 | 25648 | 2,79 |
| 3,00 | 61 | 33 | 10 | 25650 | 2,25 |
| 3,20 | 65 | 36 | 10 | 25710 | 2,77 |
| 3,25 | 65 | 36 | 10 | 25728 | 2,77 |
| 3,30 | 65 | 36 | 10 | 25730 | 2,77 |
| 3,50 | 70 | 39 | 10 | 25733 | 2,72 |
| 3,75 | 70 | 39 | 10 | 25738 | 3,29 |
| 4,00 | 75 | 43 | 10 | 25744 | 2,96 |
| 4,20 | 75 | 43 | 10 | 25751 | 3,29 |
| 4,25 | 75 | 43 | 10 | 25756 | 3,29 |
| 4,50 | 80 | 47 | 10 | 25762 | 3,29 |
| 4,75 | 80 | 47 | 10 | 25764 | 3,66 |
| 5,00 | 86 | 52 | 10 | 25769 | 3,52 |
| 5,20 | 86 | 52 | 10 | 25774 | 4,37 |

| D mm | L mm | l mm | | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| 5,25 | 86 | 52 | 10 | 25777 | 4,12 |
| 5,50 | 93 | 57 | 10 | 25780 | 4,45 |
| 5,75 | 93 | 57 | 10 | 25786 | 4,97 |
| 6,00 | 93 | 57 | 10 | 25788 | 4,75 |
| 6,25 | 101 | 63 | 10 | 25790 | 5,45 |
| 6,50 | 101 | 63 | 10 | 25793 | 5,54 |
| 6,75 | 109 | 69 | 10 | 25795 | 6,51 |
| 6,80 | 109 | 69 | 10 | 25798 | 6,49 |
| 7,00 | 109 | 69 | 10 | 25801 | 6,04 |
| 7,25 | 109 | 69 | 10 | 25803 | 8,29 |
| 7,50 | 109 | 69 | 10 | 25805 | 6,43 |
| 7,75 | 117 | 75 | 10 | 69952 | 9,95 |
| 8,00 | 117 | 75 | 10 | 25807 | 7,52 |
| 8,25 | 117 | 75 | 5 | 25809 | 9,57 |
| 8,50 | 117 | 75 | 5 | 25811 | 7,86 |
| 8,75 | 125 | 81 | 5 | 69950 | 12,06 |
| 9,00 | 125 | 81 | 5 | 25813 | 10,00 |
| New! | 9,10 | 125 | 81 | 5 | 48842 | 14,18 |
| New! | 9,20 | 125 | 81 | 5 | 48845 | 14,18 |
| 9,25 | 125 | 81 | 5 | 69949 | 13,34 |
| New! | 9,30 | 125 | 81 | 5 | 48848 | 14,18 |

| | D mm | L mm | l mm | | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|
| | 9,50 | 125 | 81 | 5 | 25815 | 10,35 |
| | 9,75 | 133 | 87 | 5 | 69947 | 15,73 |
| | 10,00 | 133 | 87 | 5 | 25817 | 11,43 |
| | 10,20 | 133 | 87 | 1 | 32666 | 15,41 |
| | 10,25 | 133 | 87 | 1 | 25819 | 20,09 |
| | 10,50 | 133 | 87 | 1 | 25821 | 15,41 |
| | 10,75 | 142 | 94 | 1 | 69946 | 22,15 |
| | 11,00 | 142 | 94 | 1 | 25823 | 17,01 |
| New! | 11,10 | 142 | 94 | 1 | 48851 | 23,36 |
| New! | 11,20 | 142 | 94 | 1 | 48854 | 23,36 |
| | 11,25 | 142 | 94 | 1 | 69945 | 24,26 |
| New! | 11,30 | 142 | 94 | 1 | 48857 | 23,36 |
| | 11,50 | 142 | 94 | 1 | 25825 | 19,57 |
| | 11,75 | 142 | 94 | 1 | 69944 | 25,12 |
| | 12,00 | 151 | 101 | 1 | 25827 | 20,98 |
| | 12,25 | 151 | 101 | 1 | 69943 | 26,65 |
| | 12,50 | 151 | 101 | 1 | 25829 | 23,35 |
| | 12,75 | 151 | 101 | 1 | 69941 | 27,83 |
| | 13,00 | 151 | 101 | 1 | 25831 | 23,69 |
| | 14,00 | 160 | 108 | 1 | 81564 | 25,35 |

### Ángulo de Punta 135°:
- Especial taladro mano.
- Aguzado de gran precisión.
- Menor fuerza de corte.
- Buen centrado superficies curvas.

### 135° Point Angle:
- Special portable drilling machine.
- High precision Split Point.
- Lower cutting-forces.
- Good centering on concave surfaces.

### Angle de pointe 135°:
- Perceuses à main
- Affûtage précision
- Force de coupe inférieure
- Autocentrage surfaces courbes

### Hélice 40°:
- Excelente evacuación de viruta.
- Taladrado más rápido y estable.
- Agujeros precisos hasta el final.

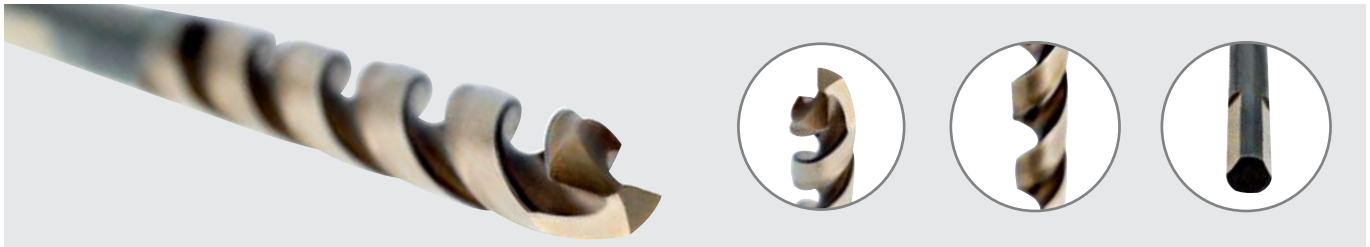
### 40° Helix:
- Excellent chip removal.
- Faster & stable drilling.
- Accurate holes right to the end.

### Helix 40°:
- Excellente évacuation copeaux
- Perçage plus rapide et stable
- Trous précis jusqu´au bout

### Mango de 3 Planos:
- Óptimo agarre y sujeción.
- Menor esfuerzo.
- Evita que se resbale la broca.
- Inmejorable transmisión de la energía.

### 3-Flat Shank:
- Optimum fixing.
- Low effort.
- No spinning in the drill-chuck.
- Ideal energy-transmission.

### Queue 3 plans:
- Fixation optimale
- Effort inférieur
- Pas de glissage du foret
- Transmission d´énérgie parfait



# METALMAX

BROCA ESPECIAL PARA TUBO
SPECIAL DRILL BIT FOR TUBE
Foret SPÉCIALE POUR TUBE

**Special Point**
Pointe spéciale

**Punta antideslizante**
Non-slip point
Pointe antidérapante

**Punta autocentrante sin taladrado previo**
Self-centering without pre-drilling
Pointe auto centreur sans pré-perçage

**Agujeros precisos**
Precise holes
Trous précis

**Mango 3 planos**
3-flat Shank
Queue 3 plans

**Óptimo agarre y sujeción**
Optimal grip and fixation
Adhérence et fixation optimales

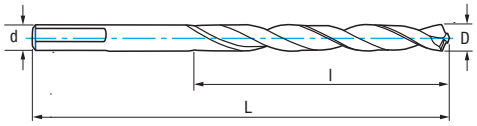
**Menor esfuerzo**
Less effort
Moins d'effort

| **TUBO**<br>Tube<br>Tube | **CHAPA**<br>Sheet<br>Tôle | **INOX**<br>Stainless Steel<br>Inox | **COBRE**<br>Copper<br>Cuivre | **ALUMINIO**<br>Aluminum<br>Aluminium |
|---|---|---|---|---|
| | | | | |

# Ref. 1032

## BROCA MANGO CILINDRICO METALMAX. SERIE CORTA
METALMAX Cobalt Drill Bit. Jobber Series
Foret cobalt METALMAX. Série courte

New!

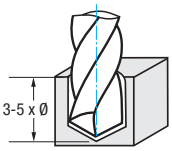



HSSE 5%Co | DIN 338 W | |

|

|

| | **Ambar Gold Finish** Finition Or | **Rectificado Ground** Taillé meulé | Tol. D h8




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x f**

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| P | P.1 | 30-35 | 0,045 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 |
| | P.5 | 8-12 | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 |
| M | | 6-12 | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 |
| N | N.1 | 30-40 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 |
| | N.2 | | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 |
| | N.3 | 60-80 | 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 |
| | N.4 | | 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 |
| | N.5 | 40-50 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 |

| D mm | L mm | l mm | | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **1,00** | 34 | 12 | 10 | 44820 | **2,22** |
| **1,50** | 40 | 18 | 10 | 44822 | **2,12** |
| **2,00** | 49 | 24 | 10 | 15169 | **2,12** |
| **2,50** | 57 | 30 | 10 | 44823 | **1,93** |
| **3,00** | 61 | 33 | 10 | 15191 | **1,88** |
| **3,30** | 65 | 36 | 10 | 84181 | **2,05** |
| **3,50** | 70 | 39 | 10 | 15193 | **2,04** |
| **4,00** | 75 | 43 | 10 | 15215 | **2,18** |
| **4,20** | 75 | 43 | 10 | 15238 | **2,50** |
| **4,50** | 80 | 47 | 10 | 15243 | **2,51** |
| **5,00** | 86 | 52 | 10 | 15244 | **2,78** |
| **5,50** | 93 | 57 | 10 | 15247 | **3,15** |
| **6,00** | 93 | 57 | 10 | 15265 | **3,52** |
| **6,50** | 101 | 63 | 10 | 15270 | **4,23** |
| **6,80** | 109 | 69 | 10 | 84182 | **4,81** |

| D mm | L mm | l mm | | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **7,00** | 109 | 69 | 10 | 15273 | **4,62** |
| **7,50** | 109 | 69 | 10 | 15280 | **5,24** |
| **8,00** | 117 | 75 | 10 | 15282 | **6,53** |
| **8,50** | 117 | 75 | 5 | 15283 | **6,67** |
| **9,00** | 125 | 81 | 5 | 15285 | **7,60** |
| **9,50** | 125 | 81 | 5 | 44825 | **7,87** |
| **10,00** | 133 | 87 | 5 | 15291 | **9,88** |
| **10,20** | 133 | 87 | 5 | 84183 | **11,42** |
| **10,50** | 133 | 87 | 5 | 15292 | **11,76** |
| **11,00** | 142 | 94 | 5 | 15298 | **13,36** |
| **11,50** | 142 | 94 | 5 | 44828 | **14,51** |
| **12,00** | 151 | 101 | 5 | 15303 | **15,18** |
| **12,50** | 151 | 101 | 5 | 44831 | **17,06** |
| **13,00** | 151 | 101 | 5 | 15304 | **17,31** |

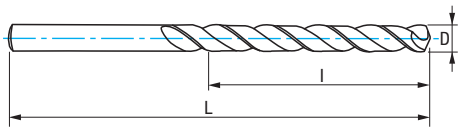
# Ref. 1020

SPEED MAX

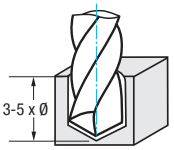
## BROCA MANGO CILÍNDRICO INOX. SERIE CORTA

Stainless Steel Straight Shank Drill Bit. Jobber Series

Foret queue cylindrique Inoxydable. Série courte




HSSE 5%Co | DIN 338 W | 135° | 40° | DIN 1412 C ≥ 2 mm | < 4 mm Chapa Sheets Tôle | Tol. D h8




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 |
| M | | 6-12 | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 | 0,150 |
| N | N.3 | 60-80 | 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 |
| | N.4 | | 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 |
| | N.5 | 40-50 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 |

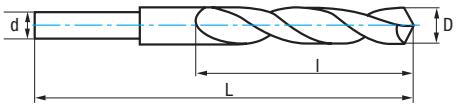
| | D mm | L mm | l mm | | Nº Art. | € |
|---|---|---|---|---|---|---|
| | 1,00 | 34 | 12 | 10 | 14115 | 2,14 |
| New! | 1,10 | 36 | 14 | 10 | 13950 | 2,60 |
| New! | 1,20 | 36 | 16 | 10 | 13951 | 2,59 |
| | 1,25 | 38 | 16 | 10 | 14116 | 2,53 |
| New! | 1,30 | 38 | 16 | 10 | 13953 | 2,59 |
| New! | 1,40 | 40 | 18 | 10 | 13954 | 2,59 |
| | 1,50 | 40 | 18 | 10 | 14117 | 2,03 |
| New! | 1,60 | 43 | 20 | 10 | 13955 | 2,59 |
| New! | 1,70 | 43 | 20 | 10 | 13956 | 2,59 |
| New! | 1,80 | 46 | 22 | 10 | 13958 | 2,52 |
| New! | 1,90 | 46 | 22 | 10 | 13959 | 2,52 |
| | 2,00 | 49 | 24 | 10 | 21615 | 2,03 |
| | 2,10 | 49 | 24 | 10 | 13961 | 2,36 |
| | 2,20 | 53 | 27 | 10 | 13962 | 2,36 |
| | 2,25 | 53 | 27 | 10 | 21616 | 2,24 |
| | 2,30 | 53 | 27 | 10 | 13963 | 2,36 |
| | 2,40 | 57 | 30 | 10 | 13965 | 2,36 |
| | 2,50 | 57 | 30 | 10 | 21618 | 1,84 |
| | 2,60 | 57 | 30 | 10 | 13966 | 2,36 |
| | 2,70 | 61 | 33 | 10 | 13968 | 2,36 |
| | 2,75 | 61 | 33 | 10 | 21625 | 2,24 |
| | 2,80 | 61 | 33 | 10 | 12964 | 2,42 |
| | 2,90 | 61 | 33 | 10 | 13969 | 2,42 |
| | 3,00 | 61 | 33 | 10 | 16283 | 1,81 |
| | 3,10 | 65 | 36 | 10 | 17970 | 2,22 |
| | 3,20 | 65 | 36 | 10 | 16284 | 2,22 |
| | 3,25 | 65 | 36 | 10 | 16285 | 2,22 |
| | 3,30 | 65 | 36 | 10 | 16286 | 2,22 |
| | 3,40 | 70 | 39 | 10 | 13971 | 2,42 |
| | 3,50 | 70 | 39 | 10 | 16287 | 2,20 |
| | 3,60 | 70 | 39 | 10 | 13972 | 2,90 |
| | 3,70 | 70 | 39 | 10 | 14120 | 2,90 |
| | 3,75 | 70 | 39 | 10 | 16288 | 2,63 |
| | 3,80 | 75 | 43 | 10 | 12507 | 2,90 |
| | 3,90 | 75 | 43 | 10 | 13974 | 2,90 |
| | 4,00 | 75 | 43 | 10 | 16289 | 2,36 |
| | 4,10 | 75 | 43 | 10 | 16290 | 2,63 |
| | 4,20 | 75 | 43 | 10 | 16291 | 2,63 |
| | 4,25 | 75 | 43 | 10 | 16292 | 2,63 |
| | 4,30 | 80 | 47 | 10 | 14122 | 2,90 |
| | 4,40 | 80 | 47 | 10 | 13975 | 2,90 |
| | 4,50 | 80 | 47 | 10 | 16293 | 2,63 |
| | 4,60 | 80 | 47 | 10 | 13979 | 3,08 |
| | 4,70 | 80 | 47 | 10 | 13981 | 3,08 |
| | 4,75 | 80 | 47 | 10 | 16294 | 2,93 |
| | 4,80 | 86 | 52 | 10 | 14123 | 3,23 |
| | 4,90 | 86 | 52 | 10 | 13983 | 3,23 |
| | 5,00 | 86 | 52 | 10 | 16295 | 2,83 |
| | 5,10 | 86 | 52 | 10 | 16296 | 3,34 |
| | 5,20 | 86 | 52 | 10 | 28626 | 3,49 |

| | D mm | L mm | l mm | | Nº Art. | € |
|---|---|---|---|---|---|---|
| | 5,25 | 86 | 52 | 10 | 16297 | 3,30 |
| | 5,30 | 86 | 52 | 10 | 13984 | 3,35 |
| | 5,40 | 93 | 57 | 10 | 13986 | 3,35 |
| | 5,50 | 93 | 57 | 10 | 16298 | 3,57 |
| | 5,60 | 93 | 57 | 10 | 13987 | 4,40 |
| | 5,70 | 93 | 57 | 10 | 25134 | 4,40 |
| | 5,75 | 93 | 57 | 10 | 16299 | 3,98 |
| | 5,80 | 93 | 57 | 10 | 13989 | 4,40 |
| | 5,90 | 93 | 57 | 10 | 13991 | 4,40 |
| | 6,00 | 93 | 57 | 10 | 16302 | 3,79 |
| | 6,10 | 101 | 63 | 10 | 13993 | 4,65 |
| | 6,20 | 101 | 63 | 10 | 13994 | 4,65 |
| | 6,25 | 101 | 63 | 10 | 21627 | 4,36 |
| | 6,30 | 101 | 63 | 10 | 14002 | 4,65 |
| | 6,40 | 101 | 63 | 10 | 14003 | 4,65 |
| | 6,50 | 101 | 63 | 10 | 16304 | 4,42 |
| | 6,60 | 101 | 63 | 10 | 14004 | 5,52 |
| | 6,70 | 101 | 63 | 10 | 14005 | 5,52 |
| | 6,75 | 109 | 69 | 10 | 21628 | 5,20 |
| | 6,80 | 109 | 69 | 10 | 16306 | 5,20 |
| | 6,90 | 109 | 69 | 10 | 14006 | 5,52 |
| | 7,00 | 109 | 69 | 10 | 16307 | 4,83 |
| | 7,10 | 109 | 69 | 10 | 14007 | 6,95 |
| | 7,20 | 109 | 69 | 10 | 14008 | 6,95 |
| | 7,25 | 109 | 69 | 10 | 21631 | 6,62 |
| | 7,30 | 109 | 69 | 10 | 14009 | 6,95 |
| | 7,40 | 109 | 69 | 10 | 14010 | 6,95 |
| | 7,50 | 109 | 69 | 10 | 16309 | 5,16 |
| | 7,60 | 117 | 75 | 10 | 14011 | 8,42 |
| | 7,70 | 117 | 75 | 10 | 14012 | 8,42 |
| | 7,75 | 117 | 75 | 10 | 69940 | 7,95 |
| | 7,80 | 117 | 75 | 10 | 14013 | 8,42 |
| | 7,90 | 117 | 75 | 10 | 14014 | 8,42 |
| | 8,00 | 117 | 75 | 10 | 16311 | 6,03 |
| | 8,10 | 117 | 75 | 5 | 14015 | 8,02 |
| | 8,20 | 117 | 75 | 5 | 14016 | 8,02 |
| | 8,25 | 117 | 75 | 5 | 21633 | 7,65 |
| | 8,30 | 117 | 75 | 5 | 14017 | 8,02 |
| | 8,40 | 117 | 75 | 5 | 14018 | 8,02 |
| | 8,50 | 117 | 75 | 5 | 16313 | 6,30 |
| | 8,60 | 125 | 81 | 5 | 14019 | 10,31 |
| | 8,70 | 125 | 81 | 5 | 14020 | 10,31 |
| | 8,75 | 125 | 81 | 5 | 69938 | 9,65 |
| | 8,80 | 125 | 81 | 5 | 14021 | 10,31 |
| | 8,90 | 125 | 81 | 5 | 14022 | 10,31 |
| | 9,00 | 125 | 81 | 5 | 16314 | 8,00 |
| | 9,10 | 125 | 81 | 5 | 14023 | 11,20 |
| | 9,20 | 125 | 81 | 5 | 14024 | 11,20 |
| | 9,25 | 125 | 81 | 5 | 69937 | 10,68 |
| | 9,30 | 125 | 81 | 5 | 14025 | 11,20 |

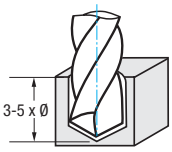
| | D mm | L mm | l mm | | Nº Art. | € |
|---|---|---|---|---|---|---|
| | 9,40 | 125 | 81 | 5 | 14026 | 11,20 |
| | 9,50 | 125 | 81 | 5 | 16316 | 8,30 |
| | 9,60 | 133 | 87 | 5 | 14027 | 13,34 |
| | 9,70 | 133 | 87 | 5 | 14028 | 13,34 |
| | 9,75 | 133 | 87 | 5 | 69935 | 12,58 |
| | 9,80 | 133 | 87 | 5 | 14029 | 13,34 |
| | 9,90 | 133 | 87 | 5 | 14060 | 13,34 |
| | 10,00 | 133 | 87 | 5 | 16318 | 9,16 |
| | 10,10 | 133 | 87 | 5 | 14064 | 15,22 |
| | 10,20 | 133 | 87 | 5 | 14248 | 12,34 |
| | 10,25 | 133 | 87 | 5 | 21634 | 16,07 |
| | 10,30 | 133 | 87 | 5 | 74568 | 15,22 |
| | 10,40 | 133 | 87 | 5 | 74567 | 15,22 |
| | 10,50 | 133 | 87 | 5 | 16320 | 12,34 |
| | 10,60 | 133 | 87 | 5 | 74566 | 17,95 |
| | 10,70 | 142 | 94 | 5 | 74565 | 17,95 |
| | 10,75 | 142 | 94 | 5 | 69934 | 17,71 |
| | 10,80 | 142 | 94 | 5 | 14249 | 17,95 |
| | 10,90 | 142 | 94 | 5 | 74564 | 17,95 |
| | 11,00 | 142 | 94 | 5 | 16321 | 13,63 |
| | 11,10 | 142 | 94 | 5 | 30587 | 19,86 |
| | 11,20 | 142 | 94 | 5 | 14250 | 19,86 |
| | 11,25 | 142 | 94 | 5 | 69932 | 19,42 |
| | 11,30 | 142 | 94 | 5 | 74563 | 19,86 |
| | 11,40 | 142 | 94 | 5 | 74562 | 19,95 |
| | 11,50 | 142 | 94 | 5 | 16322 | 15,68 |
| | 11,60 | 142 | 94 | 5 | 74561 | 20,55 |
| | 11,70 | 142 | 94 | 5 | 74560 | 20,55 |
| | 11,75 | 142 | 94 | 5 | 69931 | 20,09 |
| | 11,80 | 142 | 94 | 5 | 14252 | 20,55 |
| | 11,90 | 151 | 101 | 5 | 74559 | 20,55 |
| | 12,00 | 151 | 101 | 5 | 16323 | 16,82 |
| | 12,10 | 151 | 101 | 5 | 74558 | 21,58 |
| | 12,20 | 151 | 101 | 5 | 14276 | 21,58 |
| | 12,25 | 151 | 101 | 5 | 69929 | 21,31 |
| | 12,30 | 151 | 101 | 5 | 74557 | 21,58 |
| | 12,40 | 151 | 101 | 5 | 74556 | 21,58 |
| | 12,50 | 151 | 101 | 5 | 16324 | 18,72 |
| | 12,60 | 151 | 101 | 5 | 74554 | 22,52 |
| | 12,70 | 151 | 101 | 5 | 74553 | 22,52 |
| | 12,75 | 151 | 101 | 5 | 69928 | 22,27 |
| | 12,80 | 151 | 101 | 5 | 14288 | 22,52 |
| | 12,90 | 151 | 101 | 5 | 74552 | 22,52 |
| | 13,00 | 151 | 101 | 5 | 16325 | 18,99 |
| New! | 13,50 | 160 | 108 | 1 | 25995 | 21,06 |
| New! | 14,00 | 160 | 114 | 1 | 25996 | 20,84 |
| New! | 14,50 | 169 | 114 | 1 | 25999 | 29,53 |
| New! | 15,00 | 169 | 114 | 1 | 26000 | 29,99 |
| New! | 15,25 | 178 | 120 | 1 | 26001 | 47,96 |
| New! | 15,50 | 178 | 120 | 1 | 26004 | 34,72 |
| New! | 16,00 | 178 | 120 | 1 | 26005 | 35,98 |

# Ref. 1027

## BROCA MANGO REBAJADO MATERIALES DUROS. SERIE CORTA
Hard Materials Reduced Shank Drill Bit. Jobber Series
Foret queue reduite matériaux durs. Série courte




HSSE 5%Co | DIN 338 N | 135° | L30 mm | DIN 1412 C ≥ 2 mm | **Rectificado Ground** Taillé meulé | Tol. D h8




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | |
|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 12 | Ø 16 | Ø 20 |
| P | P.3 | 8-15 | 0,100 | 0,120 | 0,160 |
| | P.5 | 8-12 | 0,120 | 0,150 | 0,170 |
| S | | 10-15 | 0,100 | 0,120 | 0,140 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | d mm | L mm | l mm | | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|
| **10,50** | 10,00 | 133 | 87 | 1 | 54954 | **12,26** |
| **11,00** | 10,00 | 142 | 94 | 1 | 54955 | **13,54** |
| **11,50** | 10,00 | 142 | 94 | 1 | 54956 | **16,22** |
| **12,00** | 10,00 | 151 | 101 | 1 | 22346 | **17,35** |
| **12,50** | 10,00 | 151 | 101 | 1 | 54957 | **21,10** |
| **13,00** | 10,00 | 151 | 101 | 1 | 22347 | **22,26** |
| **13,50** | 12,70 | 160 | 108 | 1 | 49200 | **23,82** |
| **14,00** | 12,70 | 160 | 108 | 1 | 22344 | **24,26** |
| **14,50** | 12,70 | 169 | 114 | 1 | 49201 | **33,40** |
| **15,00** | 12,70 | 169 | 114 | 1 | 22348 | **34,90** |
| **15,50** | 12,70 | 178 | 120 | 1 | 49223 | **39,24** |
| **16,00** | 12,70 | 178 | 120 | 1 | 22349 | **40,25** |
| **16,50** | 12,70 | 184 | 125 | 1 | 54979 | **46,44** |
| **17,00** | 12,70 | 184 | 125 | 1 | 22350 | **46,00** |
| **17,50** | 12,70 | 191 | 130 | 1 | 54958 | **51,51** |
| **18,00** | 12,70 | 191 | 130 | 1 | 22351 | **55,55** |
| **18,50** | 12,70 | 198 | 135 | 1 | 54959 | **61,98** |
| **19,00** | 12,70 | 198 | 135 | 1 | 22353 | **61,34** |
| **19,50** | 12,70 | 205 | 140 | 1 | 54960 | **68,71** |
| **20,00** | 12,70 | 205 | 140 | 1 | 22354 | **72,83** |
| **20,50** | 12,70 | 205 | 145 | 1 | 66946 | **76,68** |
| **21,00** | 12,70 | 205 | 145 | 1 | 66941 | **76,68** |
| **21,50** | 12,70 | 210 | 150 | 1 | 66945 | **84,59** |
| **22,00** | 12,70 | 210 | 150 | 1 | 66940 | **84,59** |
| **22,50** | 12,70 | 210 | 150 | 1 | 66944 | **92,55** |
| **23,00** | 12,70 | 210 | 150 | 1 | 66939 | **92,55** |
| **23,50** | 12,70 | 220 | 160 | 1 | 66943 | **102,12** |
| **24,00** | 12,70 | 220 | 160 | 1 | 66938 | **102,12** |
| **24,50** | 12,70 | 220 | 160 | 1 | 66942 | **111,35** |
| **25,00** | 12,70 | 220 | 160 | 1 | 66937 | **111,35** |

IZAR® CUTTING TOOLS

# Zirkonio

**NUEVA PUNTA**
**Máximo rendimiento**

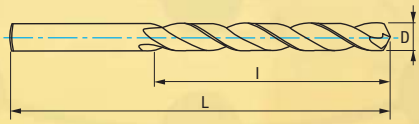
**NEW TIP**
**Maximum performance**

NOUVELLE POINTE
Rendement maximal

Ref. **1015**
ZIRKONIO

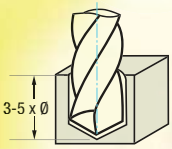
## BROCA MANGO CILÍNDRICO ZIRKONIO
Zirkonio Straight Shank Drill Bit
Foret queue cylindrique Zirkonio

Especial Multi METAL




HSS | Zirkonio | DIN 338 N | 118° | Tol. D h8

Video




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x f**

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | Zirkonio | Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 |
| P | P.1 | 33-40 | 0,045 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 | 0,180 |
| K | K.1 | 40-45 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 |
| | K.2 | 33-40 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 |
| N | N.3 | 80-105 | 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 |
| | N.4 | | 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 |
| | N.5 | 50-65 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 |

### Ángulo punta 118°
- **Autocentradora**
- **Ideal taladro portátil**
- **Geometría especial diseñada para reducir el esfuerzo de corte**

### 118° Point Angle
- **Autocentering**
- **Ideal Portable Drilling Machine**
- **Special Geometry designed for reducing cutting effort**

### Angle Pointe 118°
- Autocentreur
- Perceuse à main
- Géométrie pour réduire l´effort de coupe

### Nuevo recubrimiento Zirkonio de última generación por PVD
- **Basado en ZRN**
- **Bajo coeficiente de fricción**
- **Muy resistente a la corrosión**
- **Adecuado para materiales no férricos**
- **Evita la adherencia de material en el filo de corte**

### Latest generation Zirkonio coating by PVD
- **Based on ZRN**
- **Low Friction Coefficient**
- **High Corrosion Resistant**
- **Appropriate for Non-Ferrous Materials**
- **Built-Up Edge avoided**

### Nouveau revêtement Zirkonio dernière génération par PVD
- Base ZRN
- Faible coefficient friction
- Résistant à l´usure
- Recommandé pour aciers non ferreux
- Évite l´adhérence sur les filets de coupe

# Ref. 1015

ZIRKONIO

## BROCA MANGO CILÍNDRICO ZIRKONIO

Zirkonio Straight Shank Drill Bit

Foret queue cylindrique Zirkonio

| D mm | L mm | l mm | | Nº Art. Zirkonio | € |
|---|---|---|---|---|---|
| 1,00 | 34 | 12 | 10 | 59101 | 1,66 |
| 1,10 | 36 | 14 | 10 | 62815 | 1,94 |
| 1,20 | 38 | 16 | 10 | 62819 | 1,94 |
| New! 1,25 | 38 | 16 | 10 | 68271 | 1,94 |
| 1,30 | 38 | 16 | 10 | 62820 | 1,94 |
| 1,40 | 40 | 18 | 10 | 62821 | 1,94 |
| 1,50 | 40 | 18 | 10 | 59103 | 1,50 |
| 1,60 | 43 | 20 | 10 | 62822 | 1,94 |
| 1,70 | 43 | 20 | 10 | 62823 | 1,94 |
| 1,75 | 46 | 22 | 10 | 68274 | 1,74 |
| 1,80 | 46 | 22 | 10 | 62824 | 1,94 |
| 1,90 | 46 | 22 | 10 | 62826 | 1,94 |
| 2,00 | 49 | 24 | 10 | 59100 | 1,57 |
| 2,10 | 49 | 24 | 10 | 62827 | 1,82 |
| 2,20 | 53 | 27 | 10 | 62828 | 1,82 |
| 2,25 | 53 | 27 | 10 | 68363 | 1,67 |
| 2,30 | 53 | 27 | 10 | 62829 | 1,82 |
| 2,40 | 57 | 30 | 10 | 62830 | 1,82 |
| 2,50 | 57 | 30 | 10 | 59104 | 1,41 |
| 2,60 | 57 | 30 | 10 | 62831 | 1,77 |
| 2,70 | 61 | 33 | 10 | 62832 | 1,77 |
| 2,75 | 61 | 33 | 10 | 68364 | 1,50 |
| 2,80 | 61 | 33 | 10 | 62833 | 1,77 |
| 2,90 | 61 | 33 | 10 | 62834 | 1,77 |
| 3,00 | 61 | 33 | 10 | 59115 | 1,38 |
| 3,10 | 65 | 36 | 10 | 62835 | 1,70 |
| 3,20 | 65 | 36 | 10 | 59118 | 1,70 |
| 3,25 | 65 | 36 | 10 | 59121 | 1,70 |
| 3,30 | 65 | 36 | 10 | 59124 | 1,70 |
| 3,40 | 70 | 39 | 10 | 62836 | 1,77 |
| 3,50 | 70 | 39 | 10 | 59127 | 1,67 |
| 3,60 | 70 | 39 | 10 | 62837 | 2,13 |
| 3,70 | 70 | 39 | 10 | 62838 | 2,13 |
| 3,75 | 70 | 39 | 10 | 68365 | 1,85 |
| 3,80 | 75 | 43 | 10 | 62839 | 2,13 |
| 3,90 | 75 | 43 | 10 | 62841 | 2,13 |
| 4,00 | 75 | 43 | 10 | 59131 | 1,79 |
| 4,10 | 75 | 43 | 10 | 62842 | 1,88 |
| 4,20 | 75 | 43 | 10 | 59133 | 1,88 |
| 4,25 | 75 | 43 | 10 | 59134 | 1,88 |
| 4,30 | 80 | 47 | 10 | 62843 | 2,01 |
| 4,40 | 80 | 47 | 10 | 62844 | 2,01 |
| 4,50 | 80 | 47 | 10 | 59137 | 1,95 |
| 4,60 | 80 | 47 | 10 | 62845 | 2,24 |
| 4,70 | 80 | 47 | 10 | 62846 | 2,24 |
| 4,75 | 80 | 47 | 10 | 68350 | 2,00 |
| 4,80 | 86 | 52 | 10 | 62847 | 2,24 |
| 4,90 | 86 | 52 | 10 | 62848 | 2,24 |
| 5,00 | 86 | 52 | 10 | 58831 | 2,03 |
| 5,10 | 86 | 52 | 10 | 62849 | 2,42 |
| 5,20 | 86 | 52 | 10 | 59139 | 2,42 |
| 5,25 | 86 | 52 | 10 | 68366 | 2,33 |
| 5,30 | 86 | 52 | 10 | 62850 | 2,42 |
| 5,40 | 93 | 57 | 10 | 62851 | 2,42 |
| 5,50 | 93 | 57 | 10 | 59140 | 2,58 |
| 5,60 | 93 | 57 | 10 | 62852 | 3,08 |
| 5,70 | 93 | 57 | 10 | 62853 | 3,08 |
| 5,75 | 93 | 57 | 10 | 68367 | 2,99 |
| 5,80 | 93 | 57 | 10 | 62854 | 3,08 |
| 5,90 | 93 | 57 | 10 | 62855 | 3,08 |
| 6,00 | 93 | 57 | 10 | 59145 | 2,74 |
| 6,10 | 101 | 63 | 10 | 62856 | 3,41 |
| 6,20 | 101 | 63 | 10 | 62857 | 3,41 |
| 6,25 | 101 | 63 | 10 | 68368 | 3,17 |
| 6,30 | 101 | 63 | 10 | 62858 | 3,41 |
| 6,40 | 101 | 63 | 10 | 62859 | 3,41 |
| 6,50 | 101 | 63 | 10 | 59148 | 3,30 |
| 6,60 | 101 | 63 | 10 | 62860 | 4,08 |
| 6,70 | 101 | 63 | 10 | 62861 | 4,08 |
| 6,75 | 109 | 69 | 10 | 68369 | 3,08 |
| 6,80 | 109 | 69 | 10 | 59149 | 3,83 |
| 6,90 | 109 | 69 | 10 | 62862 | 4,08 |
| 7,00 | 109 | 69 | 10 | 59151 | 3,59 |
| 7,10 | 109 | 69 | 10 | 62863 | 5,20 |
| 7,20 | 109 | 69 | 10 | 62864 | 5,20 |
| 7,25 | 109 | 69 | 10 | 68370 | 4,25 |
| 7,30 | 109 | 69 | 10 | 62865 | 5,20 |
| 7,40 | 109 | 69 | 10 | 62866 | 5,20 |
| 7,50 | 109 | 69 | 10 | 59155 | 3,83 |
| 7,60 | 117 | 75 | 10 | 62867 | 6,28 |
| 7,70 | 117 | 75 | 10 | 62868 | 6,28 |
| 7,75 | 117 | 75 | 10 | 68371 | 4,85 |
| 7,80 | 117 | 75 | 10 | 62869 | 6,28 |
| 7,90 | 117 | 75 | 10 | 62870 | 6,28 |
| 8,00 | 117 | 75 | 10 | 59157 | 4,49 |
| 8,10 | 117 | 75 | 5 | 62871 | 5,99 |
| 8,20 | 117 | 75 | 5 | 62872 | 5,99 |
| 8,25 | 117 | 75 | 5 | 68372 | 4,51 |
| 8,30 | 117 | 75 | 5 | 62873 | 5,99 |
| 8,40 | 117 | 75 | 5 | 62874 | 5,99 |
| 8,50 | 117 | 75 | 5 | 59158 | 4,69 |
| 8,60 | 125 | 81 | 5 | 62875 | 7,61 |
| 8,70 | 125 | 81 | 5 | 62876 | 7,61 |
| 8,75 | 125 | 81 | 5 | 68373 | 5,82 |
| 8,80 | 125 | 81 | 5 | 62877 | 7,61 |
| 8,90 | 125 | 81 | 5 | 62878 | 7,61 |
| 9,00 | 125 | 81 | 5 | 59161 | 5,97 |
| 9,10 | 125 | 81 | 5 | 62879 | 8,45 |
| 9,20 | 125 | 81 | 5 | 62880 | 8,45 |
| 9,25 | 125 | 81 | 5 | 68374 | 6,51 |
| 9,30 | 125 | 81 | 5 | 62881 | 8,45 |
| 9,40 | 125 | 81 | 5 | 62882 | 8,45 |
| 9,50 | 125 | 81 | 5 | 59163 | 6,18 |
| 9,60 | 133 | 87 | 5 | 62883 | 9,94 |
| 9,70 | 133 | 87 | 5 | 62884 | 9,94 |
| 9,75 | 133 | 87 | 5 | 68375 | 7,26 |
| 9,80 | 133 | 87 | 5 | 62886 | 9,94 |
| 9,90 | 133 | 87 | 5 | 62887 | 9,94 |
| 10,00 | 133 | 87 | 5 | 59164 | 6,79 |
| 10,10 | 133 | 87 | 5 | 62888 | 11,42 |
| 10,20 | 133 | 87 | 5 | 59166 | 9,63 |
| 10,30 | 133 | 87 | 5 | 62889 | 11,42 |
| 10,40 | 133 | 87 | 5 | 62890 | 11,42 |
| 10,50 | 133 | 87 | 5 | 59167 | 9,63 |
| 10,60 | 133 | 87 | 5 | 62892 | 13,28 |
| 10,70 | 142 | 94 | 5 | 62893 | 13,28 |
| 10,80 | 142 | 94 | 5 | 62895 | 13,28 |
| 10,90 | 172 | 94 | 5 | 62896 | 13,28 |
| 11,00 | 142 | 94 | 5 | 59170 | 10,65 |
| 11,10 | 142 | 94 | 5 | 62898 | 15,10 |
| 11,20 | 142 | 94 | 5 | 62900 | 15,10 |
| 11,30 | 142 | 94 | 5 | 62902 | 15,10 |
| 11,40 | 142 | 94 | 5 | 62904 | 15,10 |
| 11,50 | 142 | 94 | 5 | 59172 | 12,72 |
| 11,60 | 172 | 94 | 5 | 62905 | 15,65 |
| 11,70 | 142 | 94 | 5 | 62907 | 15,65 |
| 11,80 | 142 | 94 | 5 | 62908 | 15,65 |
| 11,90 | 151 | 101 | 5 | 62909 | 15,65 |
| 12,00 | 151 | 101 | 5 | 59173 | 13,62 |
| 12,10 | 151 | 101 | 5 | 62910 | 18,13 |
| 12,20 | 151 | 101 | 5 | 62918 | 18,13 |
| 12,30 | 151 | 101 | 5 | 62921 | 18,13 |
| 12,40 | 151 | 101 | 5 | 62923 | 18,13 |
| 12,50 | 151 | 101 | 5 | 59176 | 16,56 |
| 12,60 | 151 | 101 | 5 | 62927 | 18,92 |
| 12,70 | 151 | 101 | 5 | 62930 | 18,92 |
| 12,80 | 151 | 101 | 5 | 62932 | 18,92 |
| 12,90 | 151 | 101 | 5 | 62934 | 18,92 |
| 13,00 | 151 | 101 | 5 | 59179 | 16,95 |
| New! 13,50 | 160 | 108 | 1 | 25147 | 23,18 |
| New! 14,00 | 160 | 108 | 1 | 25154 | 24,85 |
| New! 14,50 | 169 | 114 | 1 | 25155 | 26,72 |
| New! 15,00 | 169 | 114 | 1 | 25156 | 27,05 |
| New! 16,00 | 178 | 120 | 1 | 25157 | 32,96 |

Ref. 1052 **Extra-Corta** / **Stub** / Extra-courte Pag. 104

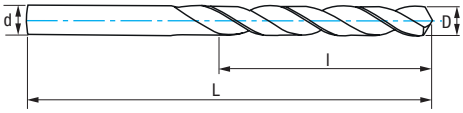
# Ref. 1010

CLASSIQUE

## BROCA MANGO CILÍNDRICO USO GENERAL HSS. SERIE CORTA

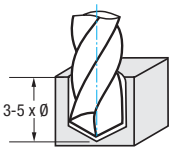
HSS General Purpose Straight Shank Drill Bit. Jobber Series

Foret queue cylindrique utilisation générale HSS. Série courte




| HSS | HSS + TIN | DIN 338 N | 118° | | | Blue Finish | **Rectificado Ground** Taillé meulé | Tol. D h8 |
|---|---|---|---|---|---|---|---|---|

**x2,5** **Resistencia al desgaste**
**Wear Resistance**
Résistant à l'usure




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

| Material | | Vc (m/min) | | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | TIN | Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.1 | 25-30 | 30-35 | 0,045 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 | 0,180 | 0,250 |
| K | K.1 | 30-35 | 36-42 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 |
| | K.2 | 25-30 | 30-36 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,280 |
| N | N.3 | 60-80 | 72-96 | 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 | 0,450 |
| | N.4 | | | 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 | 0,450 |
| | N.5 | 40-50 | 48-60 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 |

| | D mm | L mm | l mm | | Nº Art. HSS | € | Nº Art. TIN | € |
|---|---|---|---|---|---|---|---|---|
| | 0,30 | 19 | 3 | 10 | 17996 | 2,02 | | |
| | 0,35 | 19 | 4 | 10 | 17999 | 2,08 | | |
| | 0,40 | 20 | 5 | 10 | 18002 | 2,02 | | |
| | 0,45 | 20 | 5 | 10 | 18005 | 2,02 | | |
| | 0,50 | 22 | 6 | 10 | 18008 | 1,42 | | |
| | 0,55 | 24 | 7 | 10 | 18011 | 1,79 | | |
| | 0,60 | 24 | 7 | 10 | 18014 | 1,79 | | |
| | 0,65 | 26 | 8 | 10 | 18017 | 1,79 | | |
| | 0,70 | 28 | 9 | 10 | 18020 | 1,79 | | |
| | 0,75 | 28 | 9 | 10 | 18023 | 1,31 | | |
| | 0,80 | 30 | 10 | 10 | 18026 | 1,34 | | |
| | 0,85 | 30 | 10 | 10 | 18029 | 1,34 | | |
| | 0,90 | 32 | 11 | 10 | 18032 | 1,34 | | |
| | 0,95 | 32 | 11 | 10 | 18035 | 1,34 | | |
| | 1,00 | 34 | 12 | 10 | 10001 | 1,04 | 18305 | 2,08 |
| New! | 1,05 | 34 | 12 | 10 | 18038 | 1,15 | 53352 | 2,10 |
| | 1,10 | 36 | 14 | 10 | 10004 | 1,15 | 15056 | 2,10 |
| | 1,15 | 36 | 14 | 10 | 18041 | 1,15 | | |
| | 1,20 | 38 | 16 | 10 | 10007 | 1,15 | 18308 | 2,10 |
| | 1,25 | 38 | 16 | 10 | 10010 | 0,92 | 27087 | 1,95 |
| | 1,30 | 38 | 16 | 10 | 10013 | 1,02 | 18311 | 2,02 |
| | 1,35 | 40 | 18 | 10 | 18050 | 1,02 | | |
| | 1,40 | 40 | 18 | 10 | 10016 | 1,02 | 27337 | 2,02 |
| | 1,45 | 40 | 18 | 10 | 18053 | 1,02 | | |
| | 1,50 | 40 | 18 | 10 | 10019 | 0,79 | 18314 | 1,78 |
| | 1,55 | 43 | 20 | 10 | 18059 | 0,98 | | |
| | 1,60 | 43 | 20 | 10 | 10022 | 0,98 | 18317 | 1,99 |
| | 1,65 | 43 | 20 | 10 | 18062 | 0,98 | | |
| | 1,70 | 43 | 20 | 10 | 10025 | 0,98 | 18320 | 1,99 |
| | 1,75 | 46 | 22 | 10 | 10028 | 0,88 | 18323 | 1,94 |
| | 1,80 | 46 | 22 | 10 | 10031 | 0,88 | 18326 | 1,90 |
| New! | 1,85 | 46 | 22 | 10 | 18068 | 0,88 | 77801 | 1,90 |
| | 1,90 | 46 | 22 | 10 | 10034 | 0,88 | 18329 | 1,90 |
| | 1,95 | 49 | 24 | 10 | 18071 | 0,88 | | |
| | 2,00 | 49 | 24 | 10 | 10037 | 0,75 | 18332 | 1,78 |
| New! | 2,05 | 49 | 24 | 10 | 18074 | 0,77 | 14277 | 1,71 |
| | 2,10 | 49 | 24 | 10 | 10040 | 0,77 | 18335 | 1,71 |
| | 2,15 | 53 | 27 | 10 | 18077 | 0,77 | | |

| | D mm | L mm | l mm | | Nº Art. HSS | € | Nº Art. TIN | € |
|---|---|---|---|---|---|---|---|---|
| | 2,20 | 53 | 27 | 10 | 10043 | 0,77 | 18338 | 1,71 |
| | 2,25 | 53 | 27 | 10 | 10046 | 0,72 | 18341 | 1,66 |
| | 2,30 | 53 | 27 | 10 | 10049 | 0,91 | 18344 | 1,83 |
| | 2,35 | 53 | 27 | 10 | 18080 | 0,91 | | |
| | 2,40 | 57 | 30 | 10 | 10052 | 0,91 | 18347 | 1,83 |
| | 2,45 | 57 | 30 | 10 | 18083 | 0,91 | | |
| | 2,50 | 57 | 30 | 10 | 10055 | 0,75 | 18350 | 1,72 |
| New! | 2,55 | 57 | 30 | 10 | 18086 | 0,93 | 24315 | 1,84 |
| | 2,60 | 57 | 30 | 10 | 10058 | 0,93 | 18353 | 1,84 |
| | 2,65 | 57 | 30 | 10 | 18089 | 0,93 | | |
| | 2,70 | 61 | 33 | 10 | 10061 | 0,93 | 27166 | 1,84 |
| | 2,75 | 61 | 33 | 10 | 10064 | 0,79 | 18356 | 1,78 |
| | 2,80 | 61 | 33 | 10 | 10067 | 0,93 | 18359 | 1,84 |
| | 2,85 | 61 | 33 | 10 | 18092 | 0,93 | | |
| | 2,90 | 61 | 33 | 10 | 10070 | 0,93 | 27088 | 1,84 |
| | 2,95 | 61 | 33 | 10 | 18095 | 0,93 | | |
| | 3,00 | 61 | 33 | 10 | 10073 | 0,68 | 18362 | 1,61 |
| | 3,05 | 65 | 36 | 10 | 18098 | 0,90 | 17358 | 2,09 |
| | 3,10 | 65 | 36 | 10 | 10076 | 0,79 | 18365 | 2,05 |
| | 3,15 | 65 | 36 | 10 | 27343 | 0,90 | 29078 | 2,09 |
| | 3,20 | 65 | 36 | 10 | 10079 | 0,79 | 18368 | 2,05 |
| | 3,25 | 65 | 36 | 10 | 10082 | 0,79 | 18371 | 2,05 |
| | 3,30 | 65 | 36 | 10 | 10085 | 0,79 | 18374 | 2,05 |
| New! | 3,35 | 65 | 36 | 10 | 27345 | 1,02 | 24316 | 2,18 |
| | 3,40 | 70 | 39 | 10 | 10088 | 1,03 | 27322 | 2,19 |
| | 3,45 | 70 | 39 | 10 | 27346 | 1,03 | 21777 | 2,19 |
| | 3,50 | 70 | 39 | 10 | 10091 | 0,77 | 18377 | 2,01 |
| | 3,55 | 70 | 39 | 10 | 18101 | 1,06 | | |
| | 3,60 | 70 | 39 | 10 | 10094 | 1,06 | 27323 | 2,22 |
| | 3,65 | 70 | 39 | 10 | 18104 | 1,06 | | |
| | 3,70 | 70 | 39 | 10 | 10097 | 1,06 | 18380 | 2,22 |
| | 3,75 | 70 | 39 | 10 | 10100 | 0,91 | 18383 | 2,14 |
| | 3,80 | 75 | 43 | 10 | 10103 | 1,09 | 18386 | 2,25 |
| | 3,85 | 75 | 43 | 10 | 18107 | 1,09 | 79546 | 2,25 |
| | 3,90 | 75 | 43 | 10 | 10106 | 1,09 | 27165 | 2,25 |
| | 3,95 | 75 | 43 | 10 | 18110 | 1,09 | | |
| | 4,00 | 75 | 43 | 10 | 10109 | 0,89 | 18389 | 2,11 |
| | 4,05 | 75 | 43 | 10 | 27349 | 1,09 | | |

Ref. 1010
CLASSIQUE

# BROCA MANGO CILÍNDRICO USO GENERAL HSS. SERIE CORTA
HSS General Purpose Straight Shank Drill Bit. Jobber Series
Foret queue cylindrique utilisation générale HSS. Série courte

| D mm | L mm | l mm | | Nº Art. HSS | € | Nº Art. TIN | € |
|---|---|---|---|---|---|---|---|
| 4,10 | 75 | 43 | 10 | 10112 | 0,98 | 18392 | 2,19 |
| 4,15 | 75 | 43 | 10 | 27350 | 1,09 | | |
| 4,20 | 75 | 43 | 10 | 10115 | 0,98 | 18395 | 2,19 |
| 4,25 | 75 | 43 | 10 | 10118 | 0,98 | 18398 | 2,19 |
| 4,30 | 80 | 47 | 10 | 10121 | 1,30 | 18401 | 2,43 |
| 4,35 | 80 | 47 | 10 | 18113 | 1,30 | | |
| 4,40 | 80 | 47 | 10 | 10124 | 1,30 | 18404 | 2,43 |
| 4,45 | 80 | 47 | 10 | 18116 | 1,30 | | |
| 4,50 | 80 | 47 | 10 | 10127 | 1,02 | 18407 | 2,23 |
| 4,55 | 80 | 47 | 10 | 27288 | 1,31 | | |
| 4,60 | 80 | 47 | 10 | 10130 | 1,31 | 18410 | 2,45 |
| 4,65 | 80 | 47 | 10 | 27352 | 1,31 | | |
| 4,70 | 80 | 47 | 10 | 10133 | 1,31 | 18413 | 2,45 |
| 4,75 | 80 | 47 | 10 | 10136 | 1,15 | 18416 | 2,35 |
| 4,80 | 86 | 52 | 10 | 10139 | 1,46 | 18419 | 2,59 |
| 4,85 | 86 | 52 | 10 | 18119 | 1,43 | | |
| 4,90 | 86 | 52 | 10 | 10142 | 1,43 | 18422 | 2,55 |
| 4,95 | 86 | 52 | 10 | 18122 | 1,43 | | |
| 5,00 | 86 | 52 | 10 | 10145 | 1,08 | 18425 | 2,27 |
| 5,05 | 86 | 52 | 10 | 18125 | 1,47 | 21749 | 2,58 |
| 5,10 | 86 | 52 | 10 | 10148 | 1,47 | 18428 | 2,58 |
| 5,15 | 86 | 52 | 10 | 27330 | 1,47 | | |
| 5,20 | 86 | 52 | 10 | 10151 | 1,47 | 18431 | 2,58 |
| 5,25 | 86 | 52 | 10 | 10154 | 1,38 | 18434 | 2,57 |
| 5,30 | 86 | 52 | 10 | 10157 | 1,82 | 18437 | 2,92 |
| 5,35 | 93 | 57 | 10 | 18131 | 1,82 | | |
| 5,40 | 93 | 57 | 10 | 10160 | 1,82 | 27292 | 2,92 |
| 5,45 | 93 | 57 | 10 | 27354 | 1,82 | | |
| 5,50 | 93 | 57 | 10 | 10163 | 1,44 | 18440 | 2,63 |
| 5,55 | 93 | 57 | 10 | 27356 | 1,95 | 65683 | 3,04 |
| 5,60 | 93 | 57 | 10 | 10166 | 1,95 | 18443 | 3,04 |
| 5,65 | 93 | 57 | 10 | 18134 | 1,95 | | |
| 5,70 | 93 | 57 | 10 | 10169 | 1,95 | 18446 | 3,04 |
| 5,75 | 93 | 57 | 10 | 10172 | 1,86 | 18449 | 3,03 |
| 5,80 | 93 | 57 | 10 | 10175 | 1,82 | 18452 | 2,92 |
| 5,85 | 93 | 57 | 10 | 27357 | 1,82 | | |
| 5,90 | 93 | 57 | 10 | 10178 | 1,82 | 18455 | 2,92 |
| 5,95 | 93 | 57 | 10 | 27358 | 1,82 | | |
| 6,00 | 93 | 57 | 10 | 10181 | 1,49 | 18458 | 2,65 |
| 6,05 | 101 | 63 | 10 | 27359 | 2,10 | 17594 | 5,26 |
| 6,10 | 101 | 63 | 10 | 10184 | 2,10 | 18461 | 5,26 |
| 6,15 | 101 | 63 | 10 | 27360 | 2,10 | 79817 | 5,26 |
| 6,20 | 101 | 63 | 10 | 10187 | 2,10 | 18464 | 5,26 |
| 6,25 | 101 | 63 | 10 | 10190 | 2,00 | 18467 | 5,26 |
| 6,30 | 101 | 63 | 10 | 10193 | 2,21 | 27324 | 5,34 |
| 6,35 | 101 | 63 | 10 | 27361 | 2,21 | | |
| 6,40 | 101 | 63 | 10 | 10196 | 2,29 | 18470 | 5,43 |
| New! 6,45 | 101 | 63 | 10 | 18137 | 2,21 | 24317 | 5,50 |
| 6,50 | 101 | 63 | 10 | 10199 | 1,72 | 18473 | 5,02 |
| 6,55 | 101 | 63 | 10 | 18140 | 2,77 | | |
| 6,60 | 101 | 63 | 10 | 10202 | 2,77 | 18476 | 5,86 |
| New! 6,65 | 101 | 63 | 10 | 27362 | 2,77 | 24318 | 5,86 |
| 6,70 | 101 | 63 | 10 | 10205 | 2,77 | 27333 | 5,86 |
| 6,75 | 109 | 69 | 10 | 10208 | 2,08 | 18479 | 5,36 |
| 6,80 | 109 | 69 | 10 | 10211 | 2,08 | 18482 | 5,36 |
| 6,85 | 109 | 69 | 10 | 18143 | 3,06 | | |
| 6,90 | 109 | 69 | 10 | 10214 | 3,06 | 18485 | 6,12 |
| 6,95 | 109 | 69 | 10 | 27316 | 3,06 | | |
| 7,00 | 109 | 69 | 10 | 10217 | 2,08 | 18488 | 5,36 |
| 7,05 | 109 | 69 | 10 | 27363 | 3,22 | 79818 | 6,31 |

| D mm | L mm | l mm | | Nº Art. HSS | € | Nº Art. TIN | € |
|---|---|---|---|---|---|---|---|
| 7,10 | 109 | 69 | 10 | 10220 | 3,22 | 18491 | 6,31 |
| 7,15 | 109 | 69 | 10 | 27364 | 3,22 | | |
| 7,20 | 109 | 69 | 10 | 10223 | 3,22 | 18494 | 6,31 |
| 7,25 | 109 | 69 | 10 | 10226 | 2,66 | 18497 | 5,88 |
| 7,30 | 109 | 69 | 10 | 10229 | 3,22 | 18500 | 6,31 |
| 7,35 | 109 | 69 | 10 | 27365 | 3,22 | | |
| 7,40 | 109 | 69 | 10 | 10232 | 3,22 | 27150 | 6,31 |
| 7,45 | 109 | 69 | 10 | 27366 | 3,32 | | |
| 7,50 | 109 | 69 | 10 | 10235 | 2,20 | 18503 | 5,48 |
| 7,55 | 117 | 75 | 10 | 27369 | 3,83 | | |
| 7,60 | 117 | 75 | 10 | 10238 | 3,83 | 27313 | 6,91 |
| 7,65 | 117 | 75 | 10 | 27368 | 3,83 | | |
| 7,70 | 117 | 75 | 10 | 10241 | 3,83 | 18506 | 6,91 |
| 7,75 | 117 | 75 | 10 | 10244 | 2,97 | 27272 | 6,25 |
| 7,80 | 117 | 75 | 10 | 10247 | 3,87 | 18509 | 6,93 |
| 7,85 | 117 | 75 | 10 | 27370 | 3,87 | | |
| 7,90 | 117 | 75 | 10 | 10250 | 3,87 | 18512 | 6,93 |
| 7,95 | 117 | 75 | 10 | 27372 | 3,87 | | |
| 8,00 | 117 | 75 | 10 | 10253 | 2,52 | 18515 | 5,77 |
| 8,05 | 117 | 75 | 10 | 27373 | 3,96 | 39695 | 7,58 |
| 8,10 | 117 | 75 | 10 | 10256 | 3,96 | 26675 | 7,58 |
| 8,15 | 117 | 75 | 10 | 27374 | 3,96 | | |
| 8,20 | 117 | 75 | 10 | 10259 | 3,96 | 26678 | 7,58 |
| 8,25 | 117 | 75 | 10 | 10262 | 2,97 | 18518 | 6,83 |
| 8,30 | 117 | 75 | 10 | 10265 | 4,12 | 27311 | 7,74 |
| 8,35 | 117 | 75 | 10 | 27376 | 4,12 | | |
| 8,40 | 117 | 75 | 10 | 10268 | 4,12 | 26681 | 7,74 |
| 8,45 | 117 | 75 | 10 | 27377 | 4,12 | | |
| 8,50 | 117 | 75 | 10 | 10271 | 2,73 | 18521 | 6,53 |
| 8,55 | 125 | 81 | 10 | 27378 | 5,17 | | |
| 8,60 | 125 | 81 | 10 | 10274 | 5,17 | 18524 | 8,71 |
| 8,65 | 125 | 81 | 10 | 27379 | 5,17 | | |
| 8,70 | 125 | 81 | 10 | 10277 | 5,17 | 18527 | 8,71 |
| 8,75 | 125 | 81 | 10 | 10280 | 3,98 | 18530 | 7,75 |
| 8,80 | 125 | 81 | 10 | 10283 | 5,19 | 18533 | 8,72 |
| 8,85 | 125 | 81 | 10 | 27381 | 5,19 | | |
| 8,90 | 125 | 81 | 10 | 10286 | 5,19 | 18536 | 8,72 |
| 8,95 | 125 | 81 | 10 | 27383 | 5,19 | | |
| 9,00 | 125 | 81 | 10 | 10289 | 3,34 | 18539 | 7,06 |
| 9,05 | 125 | 81 | 10 | 27382 | 5,22 | | |
| 9,10 | 125 | 81 | 10 | 10292 | 5,22 | 26684 | 8,76 |
| 9,15 | 125 | 81 | 10 | 27385 | 5,22 | | |
| 9,20 | 125 | 81 | 10 | 10295 | 5,22 | 27553 | 8,76 |
| 9,25 | 125 | 81 | 10 | 10298 | 4,01 | 27273 | 7,79 |
| 9,30 | 125 | 81 | 10 | 10301 | 4,89 | 18542 | 8,45 |
| 9,35 | 125 | 81 | 10 | 27556 | 5,39 | | |
| 9,40 | 125 | 81 | 10 | 10304 | 4,89 | 27149 | 8,45 |
| 9,45 | 125 | 81 | 10 | 27387 | 4,89 | | |
| 9,50 | 125 | 81 | 10 | 10307 | 3,63 | 18545 | 7,35 |
| 9,55 | 133 | 87 | 10 | 27389 | 6,23 | | |
| 9,60 | 133 | 87 | 10 | 10310 | 6,23 | 26687 | 9,70 |
| 9,65 | 133 | 87 | 10 | 27390 | 6,23 | | |
| 9,70 | 133 | 87 | 10 | 10313 | 6,23 | 27151 | 9,70 |
| 9,75 | 133 | 87 | 10 | 10316 | 4,52 | 18548 | 8,27 |
| 9,80 | 133 | 87 | 10 | 10319 | 6,13 | 18551 | 9,60 |
| 9,85 | 133 | 87 | 10 | 27391 | 6,13 | | |
| 9,90 | 133 | 87 | 10 | 10322 | 6,13 | 18554 | 9,60 |
| 9,95 | 133 | 87 | 10 | 27393 | 6,13 | | |
| 10,00 | 133 | 87 | 10 | 10325 | 3,89 | 18557 | 7,62 |
| 10,10 | 133 | 87 | 5 | 10328 | 5,22 | 29149 | 13,27 |

# Ref. 1010
CLASSIQUE

## BROCA MANGO CILÍNDRICO USO GENERAL HSS. SERIE CORTA
HSS General Purpose Straight Shank Drill Bit. Jobber Series
Foret queue cylindrique utilisation générale HSS. Série courte

| D mm | L mm | l mm | | Nº Art. HSS | € | Nº Art. TIN | € |
|---|---|---|---|---|---|---|---|
| 10,20 | 133 | 87 | 5 | 10331 | 4,87 | 18560 | 12,92 |
| 10,25 | 133 | 87 | 5 | 10334 | 5,44 | 27274 | 13,48 |
| 10,30 | 133 | 87 | 5 | 10337 | 6,09 | 29151 | 13,78 |
| 10,40 | 133 | 87 | 5 | 10340 | 6,09 | | |
| 10,50 | 133 | 87 | 5 | 10343 | 4,87 | 18563 | 12,62 |
| 10,60 | 133 | 87 | 5 | 10346 | 6,72 | 29154 | 14,00 |
| 10,70 | 142 | 94 | 5 | 10349 | 6,72 | | |
| 10,75 | 142 | 94 | 5 | 10352 | 6,30 | 27277 | 13,94 |
| 10,80 | 142 | 94 | 5 | 10355 | 7,45 | 29157 | 14,69 |
| 10,90 | 142 | 94 | 5 | 10358 | 7,45 | | |
| 11,00 | 142 | 94 | 5 | 10361 | 5,68 | 18566 | 13,36 |
| 11,10 | 142 | 94 | 5 | 10364 | 7,57 | | |
| 11,20 | 142 | 94 | 5 | 10367 | 7,57 | | |
| 11,25 | 142 | 94 | 5 | 10370 | 6,43 | 26801 | 14,05 |
| New! 11,30 | 142 | 94 | 5 | 10373 | 7,45 | 27448 | 15,06 |
| 11,40 | 142 | 94 | 5 | 10376 | 7,45 | 27450 | 15,06 |
| 11,50 | 142 | 94 | 5 | 10379 | 6,07 | 18569 | 13,72 |
| 11,60 | 142 | 94 | 5 | 10382 | 7,45 | | |
| 11,70 | 142 | 94 | 5 | 10385 | 7,45 | | |
| 11,75 | 142 | 94 | 5 | 10388 | 6,43 | 27275 | 14,05 |
| 11,80 | 142 | 94 | 5 | 10391 | 8,14 | 29166 | 15,69 |
| 11,90 | 151 | 101 | 5 | 10394 | 8,14 | 29167 | 15,69 |
| 12,00 | 151 | 101 | 5 | 10397 | 6,75 | 18572 | 14,36 |
| 12,10 | 151 | 101 | 5 | 10400 | 9,50 | 29169 | 18,57 |
| 12,20 | 151 | 101 | 5 | 10403 | 9,50 | | |
| 12,25 | 151 | 101 | 5 | 10406 | 8,37 | 18578 | 17,92 |
| New! 12,30 | 151 | 101 | 5 | 10409 | 8,94 | 24144 | 18,49 |
| 12,40 | 151 | 101 | 5 | 10412 | 8,94 | | |
| 12,50 | 151 | 101 | 5 | 10415 | 7,43 | 18581 | 17,01 |
| 12,60 | 151 | 101 | 5 | 10418 | 9,27 | | |
| 12,70 | 151 | 101 | 5 | 10421 | 9,27 | | |
| 12,75 | 151 | 101 | 5 | 10424 | 8,25 | 27276 | 17,80 |
| 12,80 | 151 | 101 | 5 | 10427 | 10,34 | | |
| 12,90 | 151 | 101 | 5 | 10430 | 10,34 | | |
| 13,00 | 151 | 101 | 5 | 10433 | 7,68 | 18584 | 17,28 |
| 13,10 | 151 | 101 | 1 | 10436 | 10,57 | | |
| 13,20 | 151 | 101 | 1 | 18164 | 10,57 | | |
| 13,25 | 160 | 108 | 1 | 10439 | 12,06 | 29180 | 22,16 |
| 13,30 | 160 | 108 | 1 | 18167 | 16,37 | | |
| 13,40 | 160 | 108 | 1 | 18170 | 16,37 | | |
| 13,50 | 160 | 108 | 1 | 10442 | 10,88 | 29184 | 21,05 |
| 13,60 | 160 | 108 | 1 | 18173 | 16,37 | | |
| 13,70 | 160 | 108 | 1 | 10445 | 16,37 | | |
| 13,75 | 160 | 108 | 1 | 10448 | 12,23 | 16497 | 22,34 |

| D mm | L mm | l mm | | Nº Art. HSS | € | Nº Art. TIN | € |
|---|---|---|---|---|---|---|---|
| 13,80 | 160 | 108 | 1 | 18176 | 15,66 | 24664 | 25,66 |
| 13,90 | 160 | 108 | 1 | 10451 | 15,66 | 68188 | 25,66 |
| 14,00 | 160 | 108 | 1 | 10454 | 11,65 | 29007 | 21,79 |
| 14,10 | 169 | 114 | 1 | 18179 | 16,69 | | |
| 14,20 | 169 | 114 | 1 | 18185 | 16,69 | | |
| 14,25 | 169 | 114 | 1 | 10457 | 13,67 | 29194 | 23,64 |
| 14,30 | 169 | 114 | 1 | 18188 | 17,00 | | |
| 14,40 | 169 | 114 | 1 | 18191 | 17,00 | | |
| 14,50 | 169 | 114 | 1 | 10460 | 12,57 | 29198 | 22,59 |
| 14,60 | 169 | 114 | 1 | 18194 | 17,30 | | |
| 14,70 | 169 | 114 | 1 | 18197 | 17,30 | | |
| 14,75 | 169 | 114 | 1 | 10463 | 13,67 | 29202 | 23,64 |
| 14,80 | 169 | 114 | 1 | 18200 | 16,69 | | |
| 14,90 | 169 | 114 | 1 | 18203 | 16,69 | | |
| 15,00 | 169 | 114 | 1 | 10466 | 12,70 | 29205 | 22,76 |
| 15,20 | 178 | 120 | 1 | 18209 | 21,90 | | |
| 15,25 | 178 | 120 | 1 | 10469 | 18,64 | 29209 | 28,26 |
| 15,50 | 178 | 120 | 1 | 10472 | 14,86 | 29213 | 24,77 |
| 15,60 | 178 | 120 | 1 | 18218 | 25,63 | | |
| 15,70 | 178 | 120 | 1 | 18221 | 25,63 | | |
| 15,75 | 178 | 120 | 1 | 10475 | 18,89 | | |
| 15,80 | 178 | 120 | 1 | 18224 | 23,92 | | |
| 15,90 | 178 | 120 | 1 | 18227 | 23,92 | | |
| 16,00 | 178 | 120 | 1 | 10478 | 15,47 | 29220 | 25,32 |
| 16,20 | 184 | 125 | 1 | 27289 | 32,74 | | |
| 16,25 | 184 | 125 | 1 | 10481 | 27,84 | | |
| 16,50 | 184 | 125 | 1 | 10484 | 18,00 | 12861 | 27,01 |
| 16,75 | 184 | 125 | 1 | 10487 | 29,10 | 19368 | 37,77 |
| 16,80 | 184 | 125 | 1 | 27676 | 43,98 | 19369 | 52,24 |
| 17,00 | 184 | 125 | 1 | 10490 | 18,00 | 12866 | 27,02 |
| 17,25 | 191 | 130 | 1 | 10493 | 30,21 | | |
| 17,50 | 191 | 130 | 1 | 10496 | 20,69 | 12862 | 29,62 |
| 17,75 | 191 | 130 | 1 | 10499 | 33,45 | | |
| 18,00 | 191 | 130 | 1 | 10502 | 21,88 | 29236 | 29,89 |
| 18,25 | 198 | 135 | 1 | 10505 | 32,81 | | |
| New! 18,50 | 198 | 135 | 1 | 10508 | 24,30 | 10794 | 33,66 |
| 18,75 | 198 | 135 | 1 | 10511 | 33,74 | | |
| 19,00 | 198 | 135 | 1 | 10514 | 24,30 | 14065 | 33,66 |
| 19,25 | 205 | 140 | 1 | 10517 | 44,16 | | |
| 19,50 | 205 | 140 | 1 | 10520 | 26,05 | | |
| 19,75 | 205 | 140 | 1 | 10523 | 42,83 | | |
| New! 20,00 | 205 | 140 | 1 | 10526 | 29,68 | 14076 | 37,48 |

Ref. 1050

**Extra-Corta** / **Stub** / Extra-courte Pag. 105

Ref. 1030

**Larga** / **Long** / Longue Pag. 109

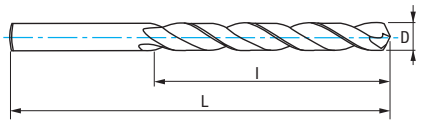
Ref. 1040

**Extra Larga** / **Extra Long** / Extra-longue Pag .112

# Ref. 1013

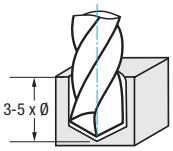
SPEED POINT

## BROCA MANGO CILÍNDRICO AGUZADA. SERIE CORTA
Split Point Straight Shank Drill Bit. Jobber Series
Foret queue cylindrique affûtage en croix. Série courte




HSS | HSS + TIALSIN | DIN 338 N | 130° | DIN 1412 C ≥ 2 mm | Rectificado Ground Taillé meulé | < 4 mm Chapa Sheets Tôle | Tol. D h8

x3,5 Resistencia al desgaste Wear Resistance Résistant à l'usure




| Material | |
|---|---|
| Grupo | Sub. |
| P | P.1 |
| K | K.1 |
| | K.2 |
| N | N.3 |
| | N.4 |
| | N.5 |

| Vc (m/min) | |
|---|---|
| HSS | TIALSIN |
| 25-30 | 33-40 |
| 30-35 | 40-45 |
| 25-30 | 33-40 |
| 60-80 | 80-105 |
| 40-50 | 50-65 |

| Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 |
| 0,045 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 | 0,180 |
| 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 |
| 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 |
| 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 |
| 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 |
| 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 |

r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$ Vf (mm/min.) = r.p.m. x f

| D mm | L mm | l mm | | N° Art. HSS | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|
| 1,00 | 34 | 12 | 10 | 17673 | 1,17 | 37620 | 2,70 |
| 1,10 | 36 | 14 | 10 | 10650 | 1,30 | | |
| 1,20 | 38 | 16 | 10 | 10656 | 1,30 | | |
| 1,30 | 38 | 16 | 10 | 10662 | 1,14 | | |
| 1,40 | 40 | 18 | 10 | 10663 | 1,14 | | |
| 1,50 | 40 | 18 | 10 | 10666 | 0,88 | 37621 | 2,43 |
| 1,60 | 43 | 20 | 10 | 10669 | 1,08 | | |
| 1,70 | 43 | 20 | 10 | 10670 | 1,08 | | |
| 1,75 | 46 | 22 | 10 | 10671 | 0,98 | | |
| 1,80 | 46 | 22 | 10 | 10672 | 0,97 | | |
| 1,90 | 46 | 22 | 10 | 10674 | 0,97 | | |
| 2,00 | 49 | 24 | 10 | 10675 | 0,82 | 37497 | 2,35 |
| 2,10 | 49 | 24 | 10 | 10677 | 0,88 | | |
| 2,20 | 53 | 27 | 10 | 13596 | 0,88 | | |
| 2,25 | 53 | 27 | 10 | 10679 | 0,79 | | |
| 2,30 | 53 | 27 | 10 | 13608 | 1,03 | | |
| 2,40 | 57 | 30 | 10 | 10683 | 1,03 | | |
| 2,50 | 57 | 30 | 10 | 10684 | 0,84 | 37622 | 2,25 |
| 2,60 | 57 | 30 | 10 | 10685 | 1,04 | | |
| 2,70 | 61 | 33 | 10 | 10686 | 1,04 | | |
| 2,75 | 61 | 33 | 10 | 10687 | 0,89 | | |
| 2,80 | 61 | 33 | 10 | 10690 | 1,04 | | |
| 2,90 | 61 | 33 | 10 | 10692 | 1,04 | | |
| 3,00 | 61 | 33 | 10 | 10693 | 0,75 | 37623 | 2,14 |
| 3,10 | 65 | 36 | 10 | 10695 | 0,89 | | |
| 3,20 | 65 | 36 | 10 | 10696 | 0,89 | 32571 | 2,75 |
| 3,25 | 65 | 36 | 10 | 10698 | 0,89 | | |
| 3,30 | 65 | 36 | 10 | 10699 | 0,89 | 37624 | 2,75 |
| 3,40 | 70 | 39 | 10 | 10701 | 1,13 | | |
| 3,50 | 70 | 39 | 10 | 10702 | 0,88 | 37625 | 2,73 |
| 3,60 | 70 | 39 | 10 | 10704 | 1,17 | | |
| 3,70 | 70 | 39 | 10 | 10705 | 1,17 | | |
| 3,75 | 70 | 39 | 10 | 10708 | 1,03 | | |
| 3,80 | 75 | 43 | 10 | 10710 | 1,25 | 39236 | 3,10 |
| 3,90 | 75 | 43 | 10 | 10719 | 1,25 | | |
| 4,00 | 75 | 43 | 10 | 10770 | 0,98 | 32572 | 2,85 |
| 4,10 | 75 | 43 | 10 | 10774 | 1,09 | | |
| 4,20 | 75 | 43 | 10 | 10776 | 1,09 | 36557 | 2,94 |

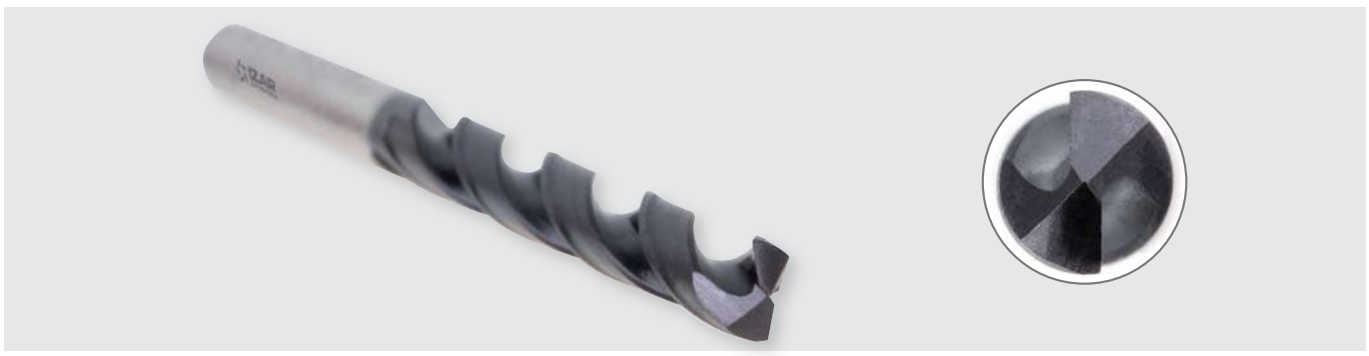
| | D mm | L mm | l mm | | N° Art. HSS | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| | 4,25 | 75 | 43 | 10 | 10777 | 1,09 | | |
| | 4,30 | 80 | 47 | 10 | 10779 | 1,46 | | |
| | 4,40 | 80 | 47 | 10 | 10780 | 1,46 | | |
| | 4,50 | 80 | 47 | 10 | 10782 | 1,12 | 37627 | 2,99 |
| | 4,60 | 80 | 47 | 10 | 10783 | 1,49 | | |
| | 4,70 | 80 | 47 | 10 | 10786 | 1,49 | 69082 | 3,34 |
| | 4,75 | 80 | 47 | 10 | 10787 | 1,32 | | |
| New! | 4,80 | 86 | 52 | 10 | 10789 | 1,63 | 39240 | 3,47 |
| | 4,90 | 86 | 52 | 10 | 10792 | 1,60 | | |
| | 5,00 | 86 | 52 | 10 | 10793 | 1,23 | 17442 | 3,07 |
| | 5,10 | 86 | 52 | 10 | 10795 | 1,64 | | |
| | 5,20 | 86 | 52 | 10 | 10797 | 1,64 | 39242 | 3,50 |
| | 5,25 | 86 | 52 | 10 | 10798 | 1,58 | | |
| | 5,30 | 86 | 52 | 10 | 10799 | 2,05 | 45421 | 3,90 |
| | 5,40 | 93 | 57 | 10 | 10800 | 2,05 | | |
| | 5,50 | 93 | 57 | 10 | 10801 | 1,62 | 37628 | 3,46 |
| | 5,60 | 93 | 57 | 10 | 10802 | 2,15 | | |
| | 5,70 | 93 | 57 | 10 | 10804 | 2,15 | 39244 | 4,00 |
| | 5,75 | 93 | 57 | 10 | 10807 | 2,11 | | |
| | 5,80 | 93 | 57 | 10 | 10808 | 2,05 | | |
| | 5,90 | 93 | 57 | 10 | 10810 | 2,05 | | |
| | 6,00 | 93 | 57 | 10 | 10811 | 1,65 | 32677 | 3,52 |
| | 6,10 | 101 | 63 | 10 | 10813 | 2,37 | | |
| New! | 6,20 | 101 | 63 | 10 | 10814 | 2,37 | 39246 | 7,55 |
| | 6,25 | 101 | 63 | 10 | 10815 | 2,21 | | |
| | 6,30 | 101 | 63 | 10 | 10816 | 2,50 | | |
| | 6,40 | 101 | 63 | 10 | 10819 | 2,53 | | |
| | 6,50 | 101 | 63 | 10 | 10822 | 1,95 | 36558 | 7,14 |
| | 6,60 | 101 | 63 | 10 | 11145 | 3,12 | | |
| | 6,70 | 101 | 63 | 10 | 11154 | 3,12 | 45424 | 8,28 |
| | 6,75 | 109 | 69 | 10 | 11157 | 2,36 | 66924 | 7,54 |
| | 6,80 | 109 | 69 | 10 | 11163 | 2,36 | 37629 | 7,54 |
| | 6,90 | 109 | 69 | 10 | 11166 | 3,42 | 45725 | 8,56 |
| | 7,00 | 109 | 69 | 10 | 11172 | 2,36 | 36559 | 7,54 |
| | 7,10 | 109 | 69 | 10 | 11175 | 3,64 | | |
| | 7,20 | 109 | 69 | 10 | 13066 | 3,64 | | |
| | 7,25 | 109 | 69 | 10 | 11184 | 2,98 | | |
| | 7,30 | 109 | 69 | 10 | 11190 | 3,64 | | |

# Ref. 1013

## BROCA MANGO CILÍNDRICO AGUZADA. SERIE CORTA
Split Point Straight Shank Drill Bit. Jobber Series
Foret queue cylindrique affutage en croix. Série courte

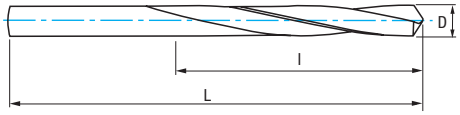
| D mm | L mm | l mm | | Nº Art. HSS | € | Nº Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|
| **7,40** | 109 | 69 | 10 | 11202 | **3,64** | | |
| **7,50** | 109 | 69 | 10 | 11217 | **2,47** | 37630 | **7,65** |
| **7,60** | 117 | 75 | 10 | 14362 | **4,31** | | |
| **7,70** | 117 | 75 | 10 | 11226 | **4,31** | | |
| **7,75** | 117 | 75 | 10 | 11229 | **3,32** | | |
| **7,80** | 117 | 75 | 10 | 11230 | **4,34** | | |
| **7,90** | 117 | 75 | 10 | 11251 | **4,34** | | |
| **8,00** | 117 | 75 | 10 | 11268 | **2,83** | 36560 | **8,00** |
| **8,10** | 117 | 75 | 5 | 11269 | **4,42** | | |
| **8,20** | 117 | 75 | 5 | 11287 | **4,42** | 64063 | **10,38** |
| **8,25** | 117 | 75 | 5 | 11290 | **3,32** | | |
| **8,30** | 117 | 75 | 5 | 11297 | **4,62** | | |
| **8,40** | 117 | 75 | 5 | 11302 | **4,62** | | |
| **8,50** | 117 | 75 | 5 | 11303 | **3,06** | 37498 | **9,04** |
| **8,60** | 125 | 81 | 5 | 11304 | **5,81** | | |
| **8,70** | 125 | 81 | 5 | 11305 | **5,81** | | |
| **8,75** | 125 | 81 | 5 | 11306 | **4,45** | | |
| **8,80** | 125 | 81 | 5 | 11307 | **5,83** | | |
| **8,90** | 125 | 81 | 5 | 11308 | **5,83** | | |
| **9,00** | 125 | 81 | 5 | 11310 | **3,74** | 37631 | **9,70** |
| **9,10** | 125 | 81 | 5 | 14378 | **5,86** | 39252 | **11,79** |
| **9,20** | 125 | 81 | 5 | 14304 | **5,86** | 64064 | **11,78** |
| **9,25** | 125 | 81 | 5 | 11313 | **4,51** | | |
| **9,30** | 125 | 81 | 5 | 14305 | **5,45** | | |
| **9,40** | 125 | 81 | 5 | 13007 | **5,45** | | |
| **9,50** | 125 | 81 | 5 | 11317 | **4,05** | 37632 | **10,02** |
| **9,60** | 133 | 87 | 5 | 11318 | **6,99** | | |
| **9,70** | 133 | 87 | 5 | 13440 | **6,99** | | |
| **9,75** | 133 | 87 | 5 | 11321 | **5,10** | | |
| **9,80** | 133 | 87 | 5 | 11322 | **6,89** | | |
| **9,90** | 133 | 87 | 5 | 11323 | **6,89** | | |
| **10,00** | 133 | 87 | 5 | 11324 | **4,36** | 36147 | **10,32** |
| **10,10** | 133 | 87 | 5 | 22341 | **5,86** | | |
| **10,20** | 133 | 87 | 5 | 17648 | **5,44** | 37633 | **17,12** |
| New! **10,25** | 133 | 87 | 5 | 53630 | **5,98** | | |
| **10,30** | 133 | 87 | 5 | 17506 | **6,84** | 37634 | **18,49** |
| **10,40** | 133 | 87 | 5 | 17966 | **6,84** | | |
| **10,50** | 133 | 87 | 5 | 17613 | **5,44** | 38088 | **17,12** |
| **10,60** | 133 | 87 | 5 | 17969 | **7,50** | | |
| **10,70** | 142 | 94 | 5 | 22342 | **7,50** | | |
| New! **10,75** | 142 | 94 | 5 | 53633 | **6,92** | | |
| **10,80** | 142 | 94 | 5 | 17972 | **8,33** | | |

| D mm | L mm | l mm | | Nº Art. HSS | € | Nº Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|
| **10,90** | 142 | 94 | 5 | 17975 | **8,33** | | |
| **11,00** | 142 | 94 | 5 | 13783 | **6,37** | 37635 | **17,99** |
| **11,10** | 142 | 94 | 5 | 17978 | **8,50** | | |
| **11,20** | 142 | 94 | 5 | 66583 | **8,50** | | |
| New! **11,25** | 142 | 94 | 5 | 53636 | **7,08** | | |
| **11,30** | 142 | 94 | 5 | 17980 | **8,50** | | |
| **11,40** | 142 | 94 | 5 | 17981 | **8,50** | | |
| **11,50** | 142 | 94 | 5 | 17609 | **6,80** | 37636 | **18,43** |
| **11,60** | 142 | 94 | 5 | 17982 | **8,34** | | |
| **11,70** | 142 | 94 | 5 | 19657 | **8,34** | | |
| **11,80** | 142 | 94 | 5 | 17984 | **9,12** | | |
| **11,90** | 151 | 101 | 5 | 17987 | **9,12** | | |
| **12,00** | 151 | 101 | 5 | 17611 | **7,57** | 37637 | **19,20** |
| **12,10** | 151 | 101 | 5 | 63357 | **10,65** | | |
| **12,20** | 151 | 101 | 5 | 63358 | **10,65** | | |
| New! **12,25** | 151 | 101 | 5 | 53639 | **9,21** | | |
| **12,30** | 151 | 101 | 5 | 22343 | **10,01** | | |
| **12,40** | 151 | 101 | 5 | 63360 | **10,01** | | |
| **12,50** | 151 | 101 | 5 | 17615 | **8,30** | 37638 | **22,97** |
| **12,60** | 151 | 101 | 5 | 63361 | **10,42** | | |
| **12,70** | 151 | 101 | 5 | 17081 | **10,42** | | |
| New! **12,75** | 151 | 101 | 5 | 53645 | **9,07** | | |
| **12,80** | 151 | 101 | 5 | 63363 | **11,59** | | |
| **12,90** | 151 | 101 | 5 | 63364 | **11,59** | | |
| **13,00** | 151 | 101 | 5 | 16556 | **8,60** | 36556 | **23,28** |
| New! **13,20** | 151 | 101 | 1 | 82665 | **11,63** | | |
| **13,50** | 160 | 108 | 1 | 22833 | **12,20** | 83459 | **26,70** |
| **14,00** | 160 | 108 | 1 | 19224 | **13,08** | 64065 | **27,56** |
| **14,50** | 169 | 114 | 1 | 24941 | **14,06** | | |
| New! **15,00** | 169 | 114 | 1 | 19227 | **14,23** | 12770 | **28,29** |
| New! **15,25** | 178 | 120 | 1 | 25973 | **20,52** | | |
| **15,50** | 178 | 120 | 1 | 51929 | **16,35** | | |
| New! **16,00** | 178 | 120 | 1 | 22306 | **17,35** | 12771 | **28,58** |
| **16,50** | 184 | 125 | 1 | 51640 | **19,19** | | |
| New! **17,00** | 184 | 125 | 1 | 48580 | **19,19** | 12784 | **32,01** |
| **17,50** | 191 | 130 | 1 | 48582 | **22,06** | | |
| New! **18,00** | 191 | 130 | 1 | 48583 | **23,35** | 12792 | **36,06** |
| **18,50** | 198 | 135 | 1 | 48585 | **25,94** | | |
| New! **19,00** | 198 | 135 | 1 | 48586 | **25,94** | 12793 | **38,56** |
| **19,50** | 205 | 140 | 1 | 48588 | **27,79** | | |
| New! **20,00** | 205 | 140 | 1 | 48589 | **31,67** | 12794 | **44,14** |

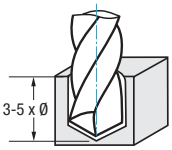


# Ref. 1012

## BROCA MANGO CILÍNDRICO COBRE/LATÓN. SERIE CORTA
Copper/Brass Straight Shank Drill Bit. Jobber Series
Foret queue cylindrique cuivre/laiton. Série courte




HSS | DIN 338 H | 118° | 15° | **Rectificado Ground** Taillé meulé | Tol. D h8




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 |
| N | N.1 | 30-40 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 |
| | N.2 | | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

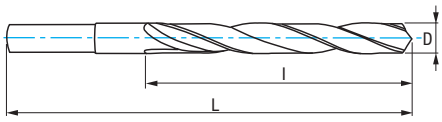
| D mm | L mm | l mm | | N° Art. HSS | € |
|---|---|---|---|---|---|
| **1,00** | 34 | 12 | 10 | 10586 | **2,80** |
| **1,25** | 38 | 16 | 10 | 27590 | **3,15** |
| **1,50** | 40 | 18 | 10 | 10589 | **2,79** |
| **2,00** | 49 | 24 | 10 | 10592 | **2,49** |
| **2,25** | 53 | 27 | 10 | 18908 | **2,65** |
| **2,50** | 57 | 30 | 10 | 10595 | **2,29** |
| **2,75** | 61 | 33 | 10 | 18917 | **3,12** |
| **3,00** | 61 | 33 | 10 | 10598 | **2,54** |
| **3,25** | 65 | 36 | 10 | 18932 | **3,12** |
| **3,50** | 70 | 39 | 10 | 10601 | **2,72** |
| ***3,75** | 70 | 39 | 10 | 18941 | **4,05** |
| **4,00** | 75 | 43 | 10 | 10604 | **2,97** |
| **4,25** | 75 | 43 | 10 | 18953 | **4,42** |
| **4,50** | 80 | 47 | 10 | 10607 | **3,63** |
| **4,75** | 80 | 47 | 10 | 18968 | **5,76** |
| **5,00** | 86 | 52 | 10 | 10610 | **3,93** |
| **5,20** | 86 | 52 | 10 | 18974 | **6,03** |
| **5,25** | 86 | 52 | 10 | 18977 | **5,94** |
| **5,50** | 93 | 57 | 10 | 10613 | **4,79** |
| ***5,75** | 93 | 57 | 10 | 18980 | **7,27** |
| **6,00** | 93 | 57 | 10 | 10616 | **5,17** |
| **6,25** | 101 | 63 | 10 | 18986 | **7,27** |
| **6,50** | 101 | 63 | 10 | 10619 | **5,76** |
| **6,75** | 109 | 69 | 10 | 18998 | **8,76** |
| **7,00** | 109 | 69 | 10 | 10622 | **6,07** |
| **7,25** | 109 | 69 | 10 | 19013 | **11,58** |

| D mm | L mm | l mm | | N° Art. HSS | € |
|---|---|---|---|---|---|
| **7,50** | 109 | 69 | 10 | 10625 | **7,14** |
| **7,75** | 117 | 75 | 10 | 19022 | **15,31** |
| **8,00** | 117 | 75 | 10 | 10628 | **7,61** |
| **8,25** | 117 | 75 | 10 | 19031 | **14,28** |
| **8,50** | 117 | 75 | 10 | 10631 | **8,82** |
| **9,00** | 125 | 81 | 10 | 10634 | **9,29** |
| **9,50** | 125 | 81 | 10 | 10637 | **10,88** |
| **9,75** | 133 | 87 | 10 | 19040 | **24,36** |
| **10,00** | 133 | 87 | 10 | 10640 | **11,34** |
| **10,50** | 133 | 87 | 5 | 10643 | **13,61** |
| **11,00** | 142 | 94 | 5 | 10646 | **15,17** |
| **11,50** | 142 | 94 | 5 | 10649 | **18,35** |
| **12,00** | 151 | 101 | 5 | 10652 | **19,78** |
| **12,50** | 151 | 101 | 5 | 10655 | **22,43** |
| **13,00** | 151 | 101 | 5 | 10658 | **24,04** |
| **14,00** | 160 | 108 | 1 | 18863 | **36,69** |
| **14,50** | 169 | 114 | 1 | 46846 | **52,67** |
| **15,00** | 169 | 114 | 1 | 54158 | **54,25** |
| **16,00** | 178 | 120 | 1 | 46847 | **57,65** |
| **16,50** | 184 | 125 | 1 | 46848 | **59,29** |
| **17,00** | 184 | 125 | 1 | 46849 | **61,10** |
| **18,00** | 191 | 130 | 1 | 54159 | **64,87** |
| **18,50** | 198 | 135 | 1 | 46851 | **66,58** |
| **19,00** | 198 | 135 | 1 | 46852 | **68,67** |
| **20,00** | 205 | 140 | 1 | 46850 | **72,49** |

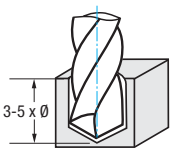
*** Diam. hasta fin de existencias / while stock lasts /** jusqu'á la fin de stock

# Ref. 1007

## BROCA MANGO REBAJADO HSS. SERIE CORTA
HSS Reduced Shank Drill Bit. Jobber Series
Foret queue reduite HSS. Série courte




HSS | DIN 338 N | 118° | L30 mm | Blue Finish | **Rectificado Ground** Taillé meulé | Tol. D h8




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | |
|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 12 | Ø 16 | Ø 20 | Ø 25 |
| P | P.1 | 25-30 | 0,160 | 0,180 | 0,250 | 0,430 |
| K | K.1 | 30-35 | 0,250 | 0,300 | 0,360 | 0,360 |
| | K.2 | 25-30 | 0,200 | 0,240 | 0,280 | 0,340 |
| N | N.3 | 60-80 | 0,320 | 0,380 | 0,450 | 0,540 |
| | N.4 | | 0,320 | 0,380 | 0,450 | 0,540 |
| | N.5 | 40-50 | 0,250 | 0,300 | 0,360 | 0,430 |

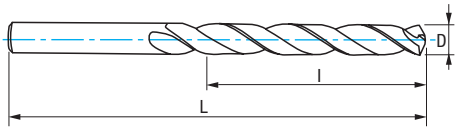
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | d mm | L mm | l mm | | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| **10,50** | 10,00 | 133 | 87 | 1 | 15976 | **7,23** |
| **11,00** | 10,00 | 142 | 94 | 1 | 15977 | **8,18** |
| **11,50** | 10,00 | 142 | 94 | 1 | 15978 | **8,65** |
| **12,00** | 10,00 | 151 | 101 | 1 | 15979 | **9,45** |
| **12,50** | 10,00 | 151 | 101 | 1 | 15980 | **10,24** |
| **13,00** | 10,00 | 151 | 101 | 1 | 15981 | **10,53** |
| **13,50** | 12,70 | 160 | 108 | 1 | 15982 | **14,22** |
| **14,00** | 12,70 | 160 | 108 | 1 | 15984 | **15,10** |
| **14,50** | 12,70 | 169 | 114 | 1 | 15985 | **16,13** |
| **15,00** | 12,70 | 169 | 114 | 1 | 15987 | **16,29** |
| **15,50** | 12,70 | 178 | 120 | 1 | 15988 | **18,79** |
| **16,00** | 12,70 | 178 | 120 | 1 | 15989 | **19,48** |
| **16,50** | 12,70 | 184 | 125 | 1 | 15990 | **21,85** |
| **17,00** | 12,70 | 184 | 125 | 1 | 15991 | **21,85** |
| **17,50** | 12,70 | 191 | 130 | 1 | 15992 | **24,86** |

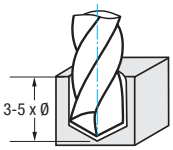
| D mm | d mm | L mm | l mm | | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| **18,00** | 12,70 | 191 | 130 | 1 | 15993 | **26,18** |
| **18,50** | 12,70 | 198 | 135 | 1 | 15994 | **28,89** |
| **19,00** | 12,70 | 198 | 135 | 1 | 15995 | **28,89** |
| **19,50** | 12,70 | 205 | 140 | 1 | 15996 | **31,48** |
| **20,00** | 12,70 | 205 | 140 | 1 | 15997 | **36,26** |
| **20,50** | 12,70 | 205 | 145 | 1 | 66932 | **38,36** |
| **21,00** | 12,70 | 205 | 145 | 1 | 17071 | **38,36** |
| **21,50** | 12,70 | 210 | 150 | 1 | 66933 | **42,29** |
| **22,00** | 12,70 | 210 | 150 | 1 | 17072 | **42,29** |
| **22,50** | 12,70 | 210 | 150 | 1 | 66934 | **46,27** |
| **23,00** | 12,70 | 210 | 150 | 1 | 36364 | **46,27** |
| **23,50** | 12,70 | 220 | 160 | 1 | 66935 | **51,07** |
| **24,00** | 12,70 | 220 | 160 | 1 | 36365 | **51,07** |
| **24,50** | 12,70 | 220 | 160 | 1 | 66936 | **55,66** |
| **25,00** | 12,70 | 220 | 160 | 1 | 36366 | **55,66** |

# Ref. 1025

## BROCA MANGO CILÍNDRICO CORTE IZQUIERDA. SERIE CORTA
Left Hand Straight Shank Drill Bit. Jobber Series
Foret queue cylindrique coupe à gauche




HSS | DIN 338 N | L | 118° | Blue Finish | **Rectificado Ground** Taillé meulé | Tol. D h8



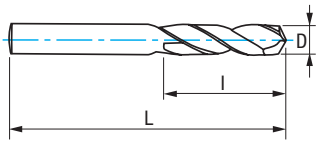

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 |
| P | P.1 | 25-30 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 |
| K | K.1 | 30-35 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 |
| | K.2 | 25-30 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 |
| N | N.3 | 60-80 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 |
| | N.4 | | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 |
| | N.5 | 40-50 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \text{ø}} \qquad Vf\ (\text{mm/min.}) = \text{r.p.m.} \times f$$

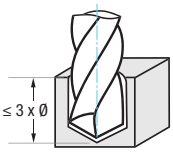
| D mm | L mm | l mm | | N° Art. HSS | € |
|---|---|---|---|---|---|
| **1,00** | 34 | 12 | 10 | 10554 | **3,63** |
| **1,50** | 40 | 18 | 10 | 10560 | **3,63** |
| **2,00** | 49 | 24 | 10 | 10562 | **3,30** |
| **2,50** | 57 | 30 | 10 | 10564 | **3,30** |
| **3,00** | 61 | 33 | 10 | 10569 | **2,50** |
| **3,50** | 70 | 39 | 10 | 11121 | **2,93** |
| **4,00** | 75 | 43 | 10 | 11566 | **3,30** |
| **4,50** | 80 | 47 | 10 | 11811 | **3,75** |
| **5,00** | 86 | 52 | 10 | 11817 | **4,05** |
| **5,50** | 93 | 57 | 10 | 11820 | **5,39** |
| **6,00** | 93 | 57 | 10 | 12001 | **5,54** |
| **6,50** | 101 | 63 | 10 | 12330 | **6,47** |
| **7,00** | 109 | 69 | 10 | 12336 | **7,85** |
| **7,50** | 109 | 69 | 10 | 12339 | **8,25** |
| **8,00** | 117 | 75 | 10 | 12345 | **9,45** |
| **8,50** | 117 | 75 | 10 | 12348 | **10,18** |
| **9,00** | 125 | 81 | 10 | 12399 | **12,39** |
| **9,50** | 125 | 81 | 10 | 12408 | **13,52** |
| **10,00** | 133 | 87 | 10 | 12417 | **14,55** |
| **11,00** | 142 | 94 | 5 | 70015 | **23,44** |
| **12,00** | 151 | 101 | 5 | 70016 | **27,86** |
| **13,00** | 151 | 101 | 5 | 70017 | **35,14** |

# Ref. 1054

## BROCA MANGO CILÍNDRICO MAT.S ALTA RESISTENCIA. SERIE EXTRA CORTA
High Resistance Materials Straight Shank Drill Bit. Stub Series
Foret queue cylindrique matériaux haute résistance. Série extra-courte




Cobalt "S" | X-AlCr | DIN 1897 N | 135° | **Rectificado Ground** Taillé meulé | Tol. D h8 | Por ejemplo For instance Par exemple **HARDOX®** wear plate



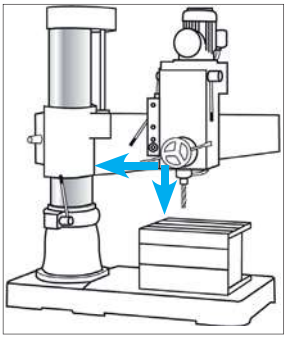

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | Cobalt "S" | Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 18 |
| P | P.4 | 6-8 | 0,020 | 0,030 | 0,040 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 | 0,160 | 0,180 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | L mm | l mm | | N° Art. X-AlCr | € |
|---|---|---|---|---|---|
| 2,00 | 38 | 12 | 1 | 32693 | 6,68 |
| 2,50 | 43 | 14 | 1 | 32694 | 5,79 |
| 3,00 | 46 | 16 | 1 | 32695 | 5,79 |
| 3,30 | 49 | 18 | 1 | 32696 | 8,17 |
| 3,50 | 52 | 20 | 1 | 32697 | 8,17 |
| 4,00 | 55 | 22 | 1 | 32698 | 8,47 |
| 4,20 | 55 | 22 | 1 | 32699 | 8,97 |
| 4,50 | 58 | 24 | 1 | 32700 | 8,97 |
| 5,00 | 62 | 26 | 1 | 32701 | 9,49 |
| 5,10 | 62 | 26 | 1 | 82696 | 10,90 |
| 5,50 | 66 | 28 | 1 | 32702 | 10,59 |

| D mm | L mm | l mm | | N° Art. X-AlCr | € |
|---|---|---|---|---|---|
| 6,00 | 66 | 28 | 1 | 32703 | 11,20 |
| 6,50 | 70 | 31 | 1 | 32704 | 13,98 |
| 6,80 | 74 | 34 | 1 | 32705 | 16,25 |
| 7,00 | 74 | 34 | 1 | 32706 | 14,82 |
| 7,50 | 74 | 34 | 1 | 32707 | 16,72 |
| 8,00 | 79 | 37 | 1 | 32708 | 16,49 |
| 8,50 | 79 | 37 | 1 | 32709 | 22,60 |
| 9,00 | 84 | 40 | 1 | 32710 | 23,50 |
| 9,50 | 84 | 40 | 1 | 32711 | 24,82 |
| 10,00 | 89 | 43 | 1 | 32712 | 26,19 |
| 10,20 | 89 | 43 | 1 | 32713 | 28,40 |

| | D mm | L mm | l mm | | N° Art. X-AlCr | € |
|---|---|---|---|---|---|---|
| | 10,50 | 89 | 43 | 1 | 32714 | 28,40 |
| | 11,00 | 95 | 47 | 1 | 32715 | 30,52 |
| | 11,50 | 95 | 47 | 1 | 32716 | 32,37 |
| | 12,00 | 102 | 51 | 1 | 32717 | 32,16 |
| | 12,50 | 102 | 51 | 1 | 32718 | 42,84 |
| | 13,00 | 102 | 51 | 1 | 32719 | 44,30 |
| | 14,00 | 107 | 54 | 1 | 32720 | 53,71 |
| | 15,00 | 111 | 56 | 1 | 32721 | 67,17 |
| | 16,00 | 115 | 58 | 1 | 32722 | 76,37 |
| New! | 17,00 | 119 | 60 | 1 | 35820 | 87,33 |
| | 18,00 | 123 | 62 | 1 | 32723 | 105,39 |



**Es vital minimizar las vibraciones a la hora de taladrar:**
- **Minimizar el voladizo de la columna al taladro**
- **Anclar la pieza con bridas de fijación**
- **Utilizar brocas cortas para minimizar la flexión**
- **Aplicar abundante refrigeración**

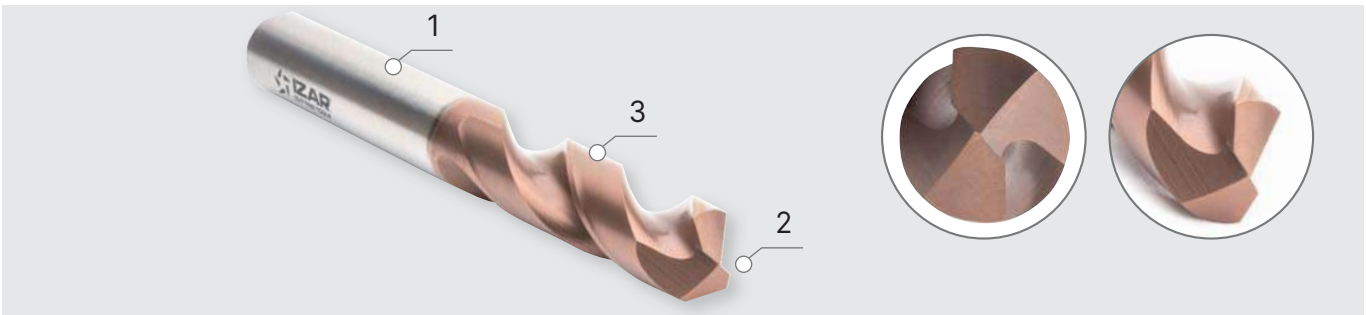
**It is vital to minimize vibrations when drilling:**
- **Minimize the distance between drill and column**
- **Clamp the workpiece securely**
- **Use short drill bits in order to minimize flexure**
- **Provide abundant supply of coolant**

**C´est vital minimiser les vibrations au moment du perçage:**
- Approcher la perceuse à colonne
- Fixer bien la pièce à usiner
- Employer des forets courts pour minimiser la flexibilité
- Refroidissez au maximum.

1- **Broca de Alto Rendimiento en Taladros Columna / CNC**
2- **Nueva Geometría especial con Nucleo Reforzado que resiste mejor las Fuerzas de Corte**
3- **Nuevo Recubrimiento con base AlCr que reduce el Desgaste en el Filo de Corte**

1- **High Performance Drill Bit in Stationary Drilling Machines / CNC**
2- **New special Reinforced Web that resists Cutting Forces better**
3- **New AlCr based Coating that reduces Cutting Edge Wear**

1- Foret haute performance pour perceuses à colonne / CNC
2- Nouvelle geométrie spéciale avec ame renforcée qui resiste mieux les forces de coupe
3- Nouveau revêtement AlCr qui réduit l'usure dans le fil de coupe

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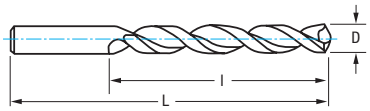
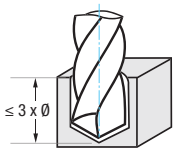
# Ref. 1055

## BROCA M. CILÍNDRICO AGUJEROS TOL. IT8-9. SERIE EXTRA CORTA
IT8-9 Tolerance Hole Straight Shank Drill Bit. Stub Series
Foret queue cylindrique trous tolérance IT8-9. Série extra-courte




HSSE 5%Co | HSSE 5%Co + TIALSIN | DIN 1897 TS | 135° | Filo Corregido Convex Edge "U" Filets Corrigés | Perfil Profile Profil "S" | Rectificado Ground Taillé meulé | Tol. D h8




| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | 5% Co | TIALSIN |
| P | P.2 | 20-25 | 28-35 |
| | P.3 | 8-15 | 12-20 |
| K | K.1 | 30-35 | 36-42 |
| | K.2 | 25-30 | 30-36 |
| N | N.5 | 40-50 | 56-70 |
| | N.6 | 35-45 | 40-58 |

| Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 |
| 0,035 | 0,045 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 | 0,130 | 0,160 |
| 0,020 | 0,035 | 0,045 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 |
| 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 |
| 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 |
| 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 |
| 0,080 | 0,130 | 0,150 | 0,170 | 0,190 | 0,250 | 0,290 | 0,310 | 0,360 |

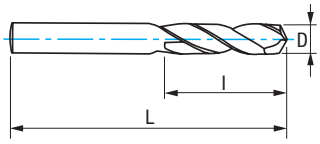
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | L mm | l mm | | N° Art. 5% Co | € | | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| 1,00 | 26 | 6 | 10 | 80498 | 4,05 | 1 | 80518 | 5,41 |
| 1,50 | 32 | 9 | 10 | 80499 | 3,90 | 1 | 80519 | 5,27 |
| 2,00 | 38 | 12 | 10 | 12486 | 3,90 | 1 | 14135 | 5,26 |
| 2,10 | 38 | 12 | 10 | 14108 | 4,65 | 1 | 14164 | 5,85 |
| 2,30 | 40 | 13 | 10 | 14110 | 4,65 | 1 | 14166 | 5,85 |
| 2,50 | 43 | 14 | 10 | 14111 | 3,19 | 1 | 14168 | 4,44 |
| 2,70 | 46 | 16 | 10 | 14112 | 3,72 | 1 | 14169 | 4,97 |
| 2,75 | 46 | 16 | 10 | 14113 | 3,89 | 1 | 14170 | 5,14 |
| 3,00 | 46 | 16 | 10 | 14114 | 3,09 | 1 | 14172 | 4,35 |
| 3,10 | 49 | 18 | 10 | 14124 | 3,77 | 1 | 14174 | 5,36 |
| 3,20 | 49 | 18 | 10 | 14125 | 3,77 | 1 | 14176 | 5,36 |
| 3,25 | 49 | 18 | 10 | 14126 | 3,77 | 1 | 14177 | 5,36 |
| 3,30 | 49 | 18 | 10 | 14127 | 3,77 | 1 | 14180 | 5,36 |
| 3,50 | 52 | 20 | 10 | 14128 | 3,74 | 1 | 14183 | 5,33 |
| 3,60 | 52 | 20 | 10 | 14130 | 4,34 | 1 | 14184 | 5,91 |
| 3,70 | 52 | 20 | 10 | 14131 | 4,34 | 1 | 14186 | 5,91 |
| 3,75 | 52 | 20 | 10 | 14132 | 4,44 | 1 | 14188 | 6,00 |
| 3,90 | 55 | 22 | 10 | 14133 | 4,74 | 1 | 14190 | 6,31 |
| 4,00 | 55 | 22 | 10 | 14134 | 4,01 | 1 | 14191 | 5,60 |
| 4,10 | 55 | 22 | 10 | 14136 | 4,48 | 1 | 14192 | 6,04 |
| 4,20 | 55 | 22 | 10 | 14137 | 4,48 | 1 | 14193 | 6,04 |
| 4,25 | 55 | 22 | 10 | 14139 | 4,48 | 1 | 14194 | 6,04 |
| 4,30 | 58 | 24 | 10 | 14140 | 5,17 | 1 | 14195 | 6,73 |
| 4,40 | 58 | 24 | 10 | 14141 | 5,17 | 1 | 14196 | 6,73 |
| 4,50 | 58 | 24 | 10 | 14142 | 4,56 | 1 | 14197 | 6,16 |
| 4,60 | 58 | 24 | 10 | 80279 | 5,40 | 1 | 80293 | 6,93 |
| 4,70 | 58 | 24 | 10 | 14143 | 5,40 | 1 | 14198 | 6,93 |
| 4,75 | 58 | 24 | 10 | 14144 | 5,00 | 1 | 14199 | 6,58 |
| 4,80 | 62 | 26 | 10 | 14145 | 5,40 | 1 | 14200 | 6,93 |
| 5,00 | 62 | 26 | 10 | 14146 | 5,00 | 1 | 14201 | 6,58 |
| 5,10 | 62 | 26 | 10 | 14147 | 6,13 | 1 | 14202 | 7,64 |
| 5,20 | 62 | 26 | 10 | 14148 | 6,13 | 1 | 14203 | 7,64 |
| 5,25 | 62 | 26 | 10 | 14149 | 5,67 | 1 | 14206 | 7,21 |

| D mm | L mm | l mm | | N° Art. 5% Co | € | | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| 5,30 | 62 | 26 | 10 | 14150 | 6,13 | 1 | 14207 | 7,64 |
| 5,50 | 66 | 28 | 10 | 14151 | 6,07 | 1 | 14208 | 7,62 |
| 5,60 | 66 | 28 | 10 | 14152 | 7,22 | 1 | 14209 | 8,71 |
| 5,75 | 66 | 28 | 10 | 14153 | 6,81 | 1 | 14211 | 8,31 |
| 5,80 | 66 | 28 | 10 | 14154 | 7,22 | 1 | 16035 | 8,71 |
| 5,90 | 66 | 28 | 10 | 14155 | 7,22 | 1 | 16059 | 8,71 |
| 6,00 | 66 | 28 | 10 | 14156 | 6,48 | 1 | 14118 | 8,00 |
| 6,10 | 70 | 31 | 5 | 80280 | 8,15 | 1 | 80295 | 12,47 |
| 6,20 | 70 | 31 | 5 | 14157 | 8,15 | 1 | 16101 | 12,47 |
| 6,30 | 70 | 31 | 5 | 80514 | 8,15 | 1 | 80530 | 12,47 |
| 6,50 | 70 | 31 | 5 | 14158 | 7,77 | 1 | 16131 | 12,06 |
| 6,80 | 74 | 34 | 5 | 14159 | 10,59 | 1 | 16140 | 14,82 |
| 7,00 | 74 | 34 | 5 | 14160 | 8,73 | 1 | 16149 | 12,97 |
| 7,20 | 74 | 34 | 5 | 14161 | 11,94 | 1 | 16380 | 16,12 |
| 7,50 | 74 | 34 | 5 | 14162 | 11,24 | 1 | 17697 | 15,45 |
| 8,00 | 79 | 37 | 5 | 14163 | 10,94 | 1 | 18352 | 15,16 |
| 8,20 | 79 | 37 | 5 | 14165 | 14,28 | 1 | 18358 | 19,19 |
| 8,50 | 79 | 37 | 5 | 14167 | 12,98 | 1 | 18373 | 17,94 |
| 8,80 | 84 | 40 | 5 | 14171 | 18,97 | 1 | 18587 | 24,93 |
| 9,00 | 84 | 40 | 5 | 14173 | 14,16 | 1 | 18590 | 19,08 |
| 9,30 | 84 | 40 | 5 | 80281 | 18,63 | 1 | 80296 | 23,42 |
| 9,50 | 84 | 40 | 5 | 14175 | 15,95 | 1 | 19431 | 20,81 |
| 9,80 | 89 | 43 | 5 | 14178 | 22,24 | 1 | 19437 | 26,91 |
| 9,90 | 89 | 43 | 5 | 80282 | 20,62 | 1 | 80298 | 25,32 |
| 10,00 | 89 | 43 | 5 | 14179 | 17,73 | 1 | 19643 | 22,53 |
| 10,20 | 89 | 43 | 1 | 80283 | 22,62 | 1 | 80300 | 33,14 |
| 10,50 | 89 | 43 | 1 | 14181 | 22,62 | 1 | 20591 | 33,14 |
| 11,00 | 95 | 47 | 1 | 14182 | 25,03 | 1 | 20658 | 35,45 |
| 11,20 | 95 | 47 | 1 | 80284 | 36,92 | 1 | 80301 | 47,01 |
| 11,50 | 95 | 47 | 1 | 14185 | 29,91 | 1 | 21547 | 40,21 |
| 12,00 | 102 | 51 | 1 | 14187 | 31,99 | 1 | 24876 | 42,23 |
| 12,50 | 102 | 51 | 1 | 80285 | 38,95 | 1 | 80302 | 51,82 |
| 13,00 | 102 | 51 | 1 | 14189 | 39,91 | 1 | 25131 | 52,76 |

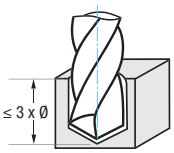
# Ref. 1056

## BROCA MANGO CILÍNDRICO MATERIALES DUROS. SERIE EXTRA CORTA
Hard Materials Straight Shank Drill Bit. Stub Series
Foret queue cylindrique matériaux durs. Série extra-courte




| HSSE 5%Co | HSSE 5%Co + TIALSIN | DIN 1897 N | 135° | DIN 1412 C ≥ 2 mm | | | Ambar Gold Finish Finition or | Rectificado Ground Taillé meulé | A.R.I.* Alto Rendimiento Intensivo<br>I.H.P.* Intensive High Performance<br>H.P.I.* Haute Performance Intensif | Tol. D h8 |
|---|---|---|---|---|---|---|---|---|---|---|

x3,5 **Resistencia al desgaste**
**Wear Resistance**
Résistant à l'usure




| Material | | Vc (m/min) | | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | TIALSIN | Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.3 | 8-15 | 12-20 | 0,020 | 0,035 | 0,045 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 | 0,160 |
| | P.5 | 8-12 | 12-17 | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 | 0,150 | 0,170 |
| S | | 10-15 | 14-20 | 0,020 | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x f**

| | D mm | L mm | l mm | | N° Art. 5% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| | 1,00 | 26 | 6 | 10 | 27835 | 2,04 | 24570 | 3,22 |
| New! | 1,10 | 28 | 7 | 10 | 82449 | 2,50 | 82455 | 3,64 |
| New! | 1,20 | 30 | 8 | 10 | 82450 | 2,50 | 82432 | 3,64 |
| | 1,25 | 30 | 8 | 10 | 11532 | 2,42 | | |
| New! | 1,30 | 30 | 8 | 10 | 82451 | 2,50 | 82456 | 3,64 |
| New! | 1,40 | 32 | 9 | 10 | 82452 | 2,50 | 82457 | 3,64 |
| | 1,50 | 32 | 9 | 10 | 27986 | 1,96 | 24573 | 3,12 |
| | 1,60 | 34 | 10 | 10 | 27838 | 2,50 | 24574 | 3,64 |
| New! | 1,70 | 34 | 10 | 10 | 82453 | 2,50 | 82458 | 3,64 |
| | 1,75 | 36 | 11 | 10 | 11536 | 2,42 | | |
| | 1,80 | 36 | 11 | 10 | 11537 | 2,50 | 24576 | 3,64 |
| New! | 1,90 | 36 | 11 | 10 | 82454 | 2,50 | 82459 | 3,64 |
| | 2,00 | 38 | 12 | 10 | 27841 | 1,97 | 22340 | 3,11 |
| | 2,10 | 38 | 12 | 10 | 11539 | 2,34 | 24577 | 3,39 |
| | 2,20 | 40 | 13 | 10 | 11540 | 2,34 | 24578 | 3,39 |
| | 2,25 | 40 | 13 | 10 | 11541 | 2,29 | | |
| | 2,30 | 40 | 13 | 10 | 11543 | 2,34 | 24580 | 3,39 |
| | 2,40 | 43 | 14 | 10 | 27844 | 2,34 | 24581 | 3,39 |
| | 2,50 | 43 | 14 | 10 | 27846 | 1,60 | 28097 | 2,68 |
| | 2,60 | 43 | 14 | 10 | 28016 | 1,86 | 24582 | 3,28 |
| | 2,70 | 46 | 16 | 10 | 27850 | 1,86 | 24583 | 2,95 |
| | 2,75 | 46 | 16 | 10 | 11544 | 1,95 | | |
| | 2,80 | 46 | 16 | 10 | 11545 | 1,86 | 24585 | 2,95 |
| | 2,90 | 46 | 16 | 10 | 11547 | 1,86 | 24586 | 2,95 |
| | 3,00 | 46 | 16 | 10 | 27853 | 1,60 | 23344 | 2,68 |
| | 3,10 | 49 | 18 | 10 | 27856 | 1,71 | 24587 | 3,08 |
| | 3,20 | 49 | 18 | 10 | 27864 | 1,71 | 24588 | 3,08 |
| | 3,25 | 49 | 18 | 10 | 27866 | 1,71 | 24631 | 3,08 |
| | 3,30 | 49 | 18 | 10 | 27870 | 1,71 | 24635 | 3,08 |
| | 3,40 | 52 | 20 | 10 | 11548 | 2,08 | 24637 | 3,46 |
| | 3,50 | 52 | 20 | 10 | 27872 | 1,71 | 23345 | 3,08 |
| | 3,60 | 52 | 20 | 10 | 11549 | 2,08 | 24645 | 3,45 |
| | 3,70 | 52 | 20 | 10 | 11550 | 2,08 | 24654 | 3,45 |
| | 3,75 | 52 | 20 | 10 | 27875 | 2,15 | | |
| | 3,80 | 55 | 22 | 10 | 27878 | 2,08 | 28095 | 3,45 |
| | 3,90 | 55 | 22 | 10 | 11551 | 2,08 | 24656 | 3,45 |

| | D mm | L mm | l mm | | N° Art. 5% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| | 4,00 | 55 | 22 | 10 | 27880 | 1,90 | 28096 | 3,25 |
| | 4,10 | 55 | 22 | 10 | 27884 | 2,26 | 24657 | 3,61 |
| | 4,20 | 55 | 22 | 10 | 27888 | 2,26 | 24658 | 3,61 |
| | 4,25 | 55 | 22 | 10 | 27891 | 2,26 | 24659 | 3,61 |
| | 4,30 | 58 | 24 | 10 | 11552 | 2,60 | 24660 | 3,93 |
| | 4,40 | 58 | 24 | 10 | 11553 | 2,60 | 24661 | 3,93 |
| | 4,50 | 58 | 24 | 10 | 27894 | 2,26 | 24737 | 3,61 |
| | 4,60 | 58 | 24 | 10 | 28058 | 2,71 | 24844 | 4,05 |
| | 4,70 | 58 | 24 | 10 | 28061 | 2,71 | 24904 | 4,05 |
| | 4,75 | 58 | 24 | 10 | 27898 | 2,51 | | |
| | 4,80 | 62 | 26 | 10 | 27901 | 2,71 | 24908 | 4,05 |
| | 4,90 | 62 | 26 | 10 | 27903 | 2,71 | 24910 | 4,05 |
| | 5,00 | 62 | 26 | 10 | 27905 | 2,51 | 28098 | 3,88 |
| | 5,10 | 62 | 26 | 10 | 27908 | 3,06 | 23346 | 4,40 |
| | 5,20 | 62 | 26 | 10 | 27910 | 3,06 | 24911 | 4,40 |
| | 5,25 | 62 | 26 | 10 | 27912 | 2,78 | 24912 | 4,16 |
| | 5,30 | 62 | 26 | 10 | 11554 | 3,06 | 24923 | 4,40 |
| | 5,40 | 66 | 28 | 10 | 11555 | 3,06 | 24926 | 4,40 |
| | 5,50 | 66 | 28 | 10 | 27916 | 2,78 | 24928 | 4,16 |
| | 5,60 | 66 | 28 | 10 | 11556 | 3,22 | 24932 | 4,47 |
| | 5,70 | 66 | 28 | 10 | 11557 | 3,22 | 24934 | 4,47 |
| | 5,75 | 66 | 28 | 10 | 27919 | 3,36 | | |
| | 5,80 | 66 | 28 | 10 | 11558 | 3,22 | 21907 | 4,47 |
| | 5,90 | 66 | 28 | 10 | 11559 | 3,22 | 25040 | 4,47 |
| | 6,00 | 66 | 28 | 10 | 27926 | 3,17 | 23054 | 4,52 |
| | 6,10 | 70 | 31 | 10 | 11561 | 4,08 | 25043 | 7,79 |
| | 6,20 | 70 | 31 | 10 | 11562 | 4,08 | 24206 | 7,79 |
| | 6,25 | 70 | 31 | 10 | 11563 | 4,24 | 25046 | 9,22 |
| | 6,30 | 70 | 31 | 10 | 27929 | 4,08 | 25049 | 7,79 |
| | 6,40 | 70 | 31 | 10 | 28094 | 4,08 | 25051 | 7,79 |
| | 6,50 | 70 | 31 | 10 | 27931 | 3,80 | 25052 | 7,52 |
| | 6,60 | 70 | 31 | 10 | 11565 | 5,12 | 25054 | 8,80 |
| | 6,70 | 70 | 31 | 10 | 11567 | 5,12 | 25055 | 8,80 |
| | 6,75 | 74 | 34 | 10 | 11568 | 5,27 | 25058 | 8,94 |
| | 6,80 | 74 | 34 | 10 | 27934 | 5,27 | 25060 | 8,94 |
| | 6,90 | 74 | 34 | 10 | 59715 | 5,81 | 78398 | 9,47 |

# Ref. 1056

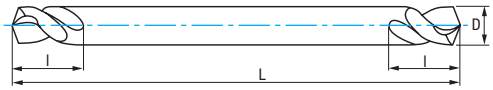
## BROCA MANGO CILÍNDRICO MATERIALES DUROS. SERIE EXTRA CORTA
Hard Materials Straight Shank Drill Bit. Stub Series
Foret queue cylindrique matériaux durs. Série extra-courte

| | D mm | L mm | l mm | | N° Art. 5% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| | 7,00 | 74 | 34 | 10 | 27936 | 4,36 | 22803 | 8,06 |
| New! | 7,20 | 74 | 34 | 10 | 48746 | 6,09 | | |
| | 7,25 | 74 | 34 | 10 | 11572 | 5,63 | | |
| New! | 7,30 | 74 | 34 | 10 | 23013 | 6,09 | 23018 | 9,74 |
| | 7,40 | 74 | 34 | 10 | 78943 | 6,09 | 82305 | 9,74 |
| | 7,50 | 74 | 34 | 10 | 27939 | 5,27 | 25063 | 8,93 |
| New! | 7,60 | 79 | 37 | 10 | 77834 | 6,47 | 77835 | 10,12 |
| | 7,70 | 79 | 37 | 10 | 78942 | 6,47 | 82306 | 10,12 |
| | 7,75 | 79 | 37 | 10 | 11577 | 6,09 | | |
| | 7,80 | 79 | 37 | 10 | 11586 | 6,47 | 25067 | 10,12 |
| | 7,90 | 79 | 37 | 10 | 83502 | 6,47 | 83501 | 10,12 |
| | 8,00 | 79 | 37 | 10 | 27941 | 5,46 | 20035 | 9,14 |
| | 8,10 | 79 | 37 | 10 | 78941 | 7,58 | 82307 | 11,83 |
| | 8,20 | 79 | 37 | 10 | 78920 | 7,58 | 82308 | 11,83 |
| | 8,25 | 79 | 37 | 10 | 11595 | 7,15 | | |
| | 8,30 | 79 | 37 | 10 | 78925 | 7,58 | 82309 | 11,83 |
| | 8,40 | 79 | 37 | 10 | 78926 | 7,58 | 82310 | 11,83 |
| | 8,50 | 79 | 37 | 10 | 27944 | 6,43 | 28099 | 10,72 |
| | 8,60 | 84 | 40 | 10 | 78927 | 8,26 | 82311 | 12,52 |
| | 8,70 | 84 | 40 | 10 | 78944 | 8,26 | 82312 | 12,52 |
| | 8,75 | 84 | 40 | 10 | 11616 | 7,79 | | |
| | 8,80 | 84 | 40 | 10 | 78928 | 8,26 | 82313 | 12,52 |
| | 8,90 | 84 | 40 | 10 | 78945 | 8,26 | 82314 | 12,52 |
| | 9,00 | 84 | 40 | 10 | 27947 | 7,09 | 25073 | 11,37 |
| New! | 9,20 | 84 | 40 | 10 | 28835 | 9,31 | | |
| | 9,25 | 84 | 40 | 10 | 28122 | 8,78 | | |
| | 9,30 | 84 | 40 | 10 | 78929 | 9,31 | 82315 | 13,52 |
| | 9,40 | 84 | 40 | 10 | 78930 | 9,31 | 82316 | 13,52 |
| | 9,50 | 84 | 40 | 10 | 27950 | 7,97 | 25076 | 12,21 |
| | 9,75 | 89 | 43 | 10 | 11712 | 9,75 | | |

| | D mm | L mm | l mm | | N° Art. 5% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| | 9,80 | 89 | 43 | 10 | 78931 | 10,32 | 82317 | 14,50 |
| | 10,00 | 89 | 43 | 10 | 27953 | 8,89 | 28100 | 13,10 |
| | 10,20 | 89 | 43 | 1 | 11730 | 9,90 | 25079 | 18,98 |
| | 10,25 | 89 | 43 | 1 | 11736 | 12,20 | | |
| | 10,30 | 89 | 43 | 1 | 78946 | 11,05 | 83266 | 20,09 |
| New! | 10,40 | 89 | 43 | 1 | 48749 | 11,05 | | |
| | 10,50 | 89 | 43 | 1 | 28136 | 9,90 | 25082 | 18,98 |
| | 10,80 | 95 | 47 | 1 | 78933 | 12,59 | | |
| | 11,00 | 95 | 47 | 1 | 27956 | 11,07 | 25084 | 20,12 |
| | 11,25 | 95 | 47 | 1 | 11793 | 16,15 | | |
| | 11,50 | 95 | 47 | 1 | 27959 | 13,08 | 18543 | 22,08 |
| New! | 11,80 | 95 | 47 | 1 | 12126 | 16,09 | 84321 | 24,98 |
| | 12,00 | 102 | 51 | 1 | 27962 | 14,00 | 23055 | 22,95 |
| | 12,25 | 102 | 51 | 1 | 11808 | 19,38 | | |
| | 12,50 | 102 | 51 | 1 | 27965 | 17,06 | 25088 | 28,31 |
| | 12,70 | 102 | 51 | 1 | 27968 | 19,48 | | |
| | 13,00 | 102 | 51 | 1 | 27971 | 17,47 | 25094 | 28,74 |
| | 13,50 | 107 | 54 | 1 | 27974 | 20,42 | 19880 | 34,67 |
| | 14,00 | 107 | 54 | 1 | 27978 | 21,99 | 25096 | 36,19 |
| | 14,50 | 111 | 56 | 1 | 11835 | 30,51 | 25097 | 41,38 |
| | 15,00 | 111 | 56 | 1 | 11838 | 30,95 | 25100 | 44,55 |
| | 15,50 | 115 | 58 | 1 | 11853 | 35,81 | | |
| New! | 16,00 | 115 | 58 | 1 | 11865 | 37,14 | 30501 | 47,78 |
| | 16,50 | 119 | 60 | 1 | 11871 | 42,50 | | |
| | 17,00 | 119 | 60 | 1 | 11874 | 42,50 | | |
| | 17,50 | 123 | 62 | 1 | 11880 | 47,05 | | |
| | 18,00 | 123 | 62 | 1 | 11883 | 51,28 | | |
| | 18,50 | 127 | 64 | 1 | 11889 | 56,61 | | |
| | 19,00 | 127 | 64 | 1 | 11898 | 56,61 | | |
| | 19,50 | 131 | 66 | 1 | 11901 | 62,77 | | |
| | 20,00 | 131 | 66 | 1 | 11907 | 67,22 | 25140 | 79,66 |

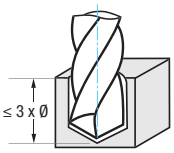
# Ref. 1666

## BROCA MANGO CILÍNDRICO DOBLE CHAPA. SERIE EXTRA CORTA
Double Sheet Straight Shank Drill Bit. Stub Series
Foret queue cylindrique double tole. Série extra-courte




HSSE 5%Co | IZAR Std. | 135° | DIN 1412 C ≥ 2 mm | < 4 mm **Chapa Sheets** Tôle | **Ambar Gold Finish** Finition or | **Rectificado Ground** Taillé meulé | **A.R.I.*** Alto Rendimiento Intensivo **I.H.P.*** Intensive High Performance H.P.I.* Haute Performance Intensif

Tol. D h8




| D mm | L mm | l mm | | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **3,25** | 52 | 14 | 10 | 28988 | **2,35** |
| **4,10** | 58 | 16 | 10 | 14373 | **2,56** |
| **4,90** | 62 | 18 | 10 | 18385 | **3,25** |
| **5,10** | 66 | 19 | 10 | 18654 | **4,62** |

Ref. 1052 New!

**BROCA MANGO CILÍNDRICO HSS ZIRKONIO. SERIE EXTRA CORTA**

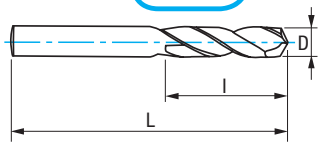
HSS Zirkonio Straight Shank Drill Bit. Stub Series

Foret queue cylindrique HSS Zirkonio. Série extra-courte

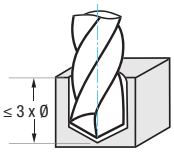
# Ref. 1052

## BROCA MANGO CILÍNDRICO HSS ZIRKONIO. SERIE EXTRA CORTA
HSS Zirkonio Straight Shank Drill Bit. Stub Series
Foret queue cylindrique HSS Zirkonio. Série extra-courte

New!




| HSS | Zirkonio | DIN 1897 N | 135° | DIN 1412 C ≥ 2 mm | | | | Rectificado Ground Taillé meulé | Tol. D h8 |
|---|---|---|---|---|---|---|---|---|---|




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

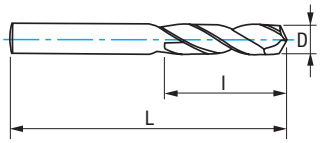
| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | Zirkonio |
| P | P.1 | 33-40 |
| K | K.1 | 40-45 |
| | K.2 | 33-40 |
| N | N.3 | 80-105 |
| | N.4 | |
| | N.5 | 50-65 |

| Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 |
| 0,045 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 | 0,180 |
| 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 |
| 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 |
| 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 |
| 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 |
| 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 |

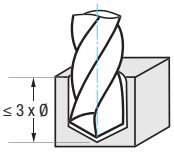
| D mm | L mm | l mm | | Nº Art. Zirkonio | € |
|---|---|---|---|---|---|
| 1,00 | 26 | 6 | 10 | 44999 | 1,65 |
| 1,10 | 28 | 7 | 10 | 48470 | 2,00 |
| 1,20 | 30 | 8 | 10 | 48476 | 2,00 |
| 1,25 | 30 | 8 | 10 | 45458 | 1,65 |
| 1,30 | 30 | 8 | 10 | 48479 | 2,15 |
| 1,40 | 32 | 9 | 10 | 48482 | 2,15 |
| 1,50 | 32 | 9 | 10 | 45002 | 1,64 |
| 1,60 | 34 | 10 | 10 | 45005 | 2,02 |
| 1,70 | 34 | 10 | 10 | 48488 | 2,21 |
| 1,75 | 36 | 11 | 10 | 45464 | 1,92 |
| 1,80 | 36 | 11 | 10 | 45026 | 2,13 |
| 1,90 | 36 | 11 | 10 | 45028 | 2,13 |
| 2,00 | 38 | 12 | 10 | 24853 | 1,74 |
| 2,10 | 40 | 13 | 10 | 45065 | 1,99 |
| 2,20 | 40 | 13 | 10 | 45068 | 1,99 |
| 2,25 | 40 | 13 | 10 | 48785 | 1,77 |
| 2,30 | 40 | 13 | 10 | 45071 | 1,84 |
| 2,40 | 43 | 14 | 10 | 45074 | 1,84 |
| 2,50 | 43 | 14 | 10 | 24898 | 1,37 |
| 2,60 | 43 | 14 | 10 | 24899 | 1,71 |
| 2,70 | 46 | 16 | 10 | 45078 | 1,71 |
| 2,75 | 46 | 16 | 10 | 45470 | 1,48 |
| 2,80 | 46 | 16 | 10 | 45080 | 1,72 |
| 2,90 | 46 | 16 | 10 | 45083 | 1,72 |
| 3,00 | 46 | 16 | 10 | 24900 | 1,49 |
| 3,10 | 49 | 18 | 10 | 45128 | 1,73 |
| 3,20 | 49 | 18 | 10 | 24901 | 1,73 |
| 3,25 | 49 | 18 | 10 | 24902 | 1,73 |
| 3,30 | 49 | 18 | 10 | 24903 | 1,73 |
| 3,40 | 52 | 20 | 10 | 45134 | 1,69 |
| 3,50 | 52 | 20 | 10 | 24905 | 1,71 |
| 3,60 | 52 | 20 | 10 | 45153 | 2,12 |
| 3,70 | 52 | 20 | 10 | 45154 | 2,12 |
| 3,75 | 52 | 20 | 10 | 45473 | 1,84 |
| 3,80 | 55 | 22 | 10 | 45163 | 2,05 |
| 3,90 | 55 | 22 | 10 | 45165 | 2,05 |
| 4,00 | 55 | 22 | 10 | 24906 | 1,83 |
| 4,10 | 55 | 22 | 10 | 24913 | 2,00 |
| 4,20 | 55 | 22 | 10 | 24943 | 2,00 |
| 4,25 | 55 | 22 | 10 | 45491 | 2,00 |
| 4,30 | 58 | 24 | 10 | 25027 | 1,93 |
| 4,40 | 58 | 24 | 10 | 45197 | 1,93 |
| 4,50 | 58 | 24 | 10 | 25028 | 2,03 |
| 4,60 | 58 | 24 | 10 | 45200 | 2,31 |
| 4,70 | 58 | 24 | 10 | 45203 | 2,31 |
| 4,75 | 58 | 24 | 10 | 45500 | 2,03 |
| 4,80 | 62 | 26 | 10 | 45206 | 2,18 |
| 4,90 | 62 | 26 | 10 | 25061 | 2,21 |
| 5,00 | 62 | 26 | 10 | 25064 | 2,15 |
| 5,10 | 62 | 26 | 10 | 45212 | 2,50 |
| 5,20 | 62 | 26 | 10 | 25066 | 2,50 |
| 5,25 | 62 | 26 | 10 | 45512 | 2,25 |
| 5,30 | 62 | 26 | 10 | 45218 | 2,11 |
| 5,40 | 66 | 28 | 10 | 45221 | 2,11 |
| 5,50 | 66 | 28 | 10 | 25072 | 2,45 |
| 5,60 | 66 | 28 | 10 | 45224 | 2,91 |
| 5,70 | 66 | 28 | 10 | 45227 | 2,91 |
| 5,75 | 66 | 28 | 10 | 45515 | 2,58 |
| 5,80 | 66 | 28 | 10 | 45230 | 3,01 |
| 5,90 | 66 | 28 | 10 | 45341 | 3,01 |
| 6,00 | 66 | 28 | 10 | 25075 | 2,79 |
| 6,10 | 70 | 31 | 10 | 45353 | 3,36 |
| 6,20 | 70 | 31 | 10 | 45356 | 3,36 |
| 6,25 | 70 | 31 | 10 | 45524 | 2,99 |
| 6,30 | 70 | 31 | 10 | 45359 | 3,23 |
| 6,40 | 70 | 31 | 10 | 45362 | 3,20 |
| 6,50 | 70 | 31 | 10 | 25078 | 3,37 |
| 6,60 | 70 | 31 | 10 | 45365 | 3,69 |
| 6,70 | 70 | 31 | 10 | 45368 | 3,69 |
| 6,75 | 74 | 34 | 10 | 45527 | 3,07 |
| 6,80 | 74 | 34 | 10 | 25081 | 3,80 |
| 6,90 | 74 | 34 | 10 | 48494 | 3,16 |
| 7,00 | 74 | 34 | 10 | 25085 | 3,57 |
| 7,10 | 74 | 34 | 10 | 48497 | 4,59 |
| 7,20 | 74 | 34 | 10 | 45374 | 4,59 |
| 7,25 | 74 | 34 | 10 | 45530 | 3,94 |
| 7,30 | 74 | 34 | 10 | 48503 | 4,49 |
| 7,40 | 74 | 34 | 10 | 45377 | 4,49 |
| 7,50 | 74 | 34 | 10 | 25091 | 4,02 |
| 7,60 | 79 | 37 | 10 | 48506 | 5,33 |
| 7,70 | 79 | 37 | 10 | 48533 | 5,33 |
| 7,75 | 79 | 37 | 10 | 45536 | 4,46 |
| 7,80 | 79 | 37 | 10 | 45380 | 5,30 |
| 7,90 | 79 | 37 | 10 | 48539 | 5,30 |
| 8,00 | 79 | 37 | 10 | 25102 | 4,58 |
| 8,10 | 79 | 37 | 10 | 48542 | 5,49 |
| 8,20 | 79 | 37 | 10 | 48548 | 5,49 |
| 8,25 | 79 | 37 | 10 | 45539 | 4,69 |
| 8,30 | 79 | 37 | 10 | 48551 | 5,29 |
| 8,40 | 79 | 37 | 10 | 48554 | 5,29 |
| 8,50 | 79 | 37 | 10 | 25106 | 5,11 |
| 8,70 | 84 | 40 | 10 | 45383 | 5,85 |
| 8,75 | 84 | 40 | 10 | 45542 | 5,20 |
| 8,80 | 84 | 40 | 10 | 48557 | 5,83 |
| 8,90 | 84 | 40 | 10 | 48560 | 5,83 |
| 9,00 | 84 | 40 | 10 | 25130 | 6,04 |
| 9,10 | 84 | 40 | 10 | 45386 | 7,33 |
| 9,20 | 84 | 40 | 10 | 48563 | 7,33 |
| 9,25 | 84 | 40 | 10 | 45545 | 6,26 |
| 9,30 | 84 | 40 | 10 | 48566 | 7,73 |
| 9,40 | 84 | 40 | 10 | 48569 | 7,73 |
| 9,50 | 84 | 40 | 10 | 25132 | 6,39 |
| 9,60 | 89 | 43 | 10 | 48572 | 9,46 |
| 9,70 | 89 | 43 | 10 | 48575 | 9,46 |
| 9,75 | 89 | 43 | 10 | 45548 | 6,92 |
| 9,80 | 89 | 43 | 10 | 48578 | 8,06 |
| 9,90 | 89 | 43 | 10 | 48581 | 8,06 |
| 10,00 | 89 | 43 | 10 | 25135 | 7,18 |
| 10,10 | 89 | 43 | 1 | 48584 | 11,24 |
| 10,20 | 89 | 43 | 1 | 25137 | 9,91 |
| 10,25 | 89 | 43 | 1 | 45551 | 9,91 |
| 10,30 | 89 | 43 | 1 | 48587 | 10,50 |
| 10,50 | 89 | 43 | 1 | 25138 | 9,53 |
| 10,80 | 95 | 47 | 1 | 48590 | 11,70 |
| 11,00 | 95 | 47 | 1 | 25139 | 10,21 |
| 11,10 | 95 | 47 | 1 | 48788 | 13,53 |
| 11,20 | 95 | 47 | 1 | 48593 | 13,53 |
| 11,25 | 95 | 47 | 1 | 45557 | 13,14 |
| 11,50 | 95 | 47 | 1 | 45389 | 12,48 |
| 11,80 | 95 | 47 | 1 | 48602 | 14,93 |
| 12,00 | 102 | 51 | 1 | 25141 | 12,99 |
| 12,10 | 102 | 51 | 1 | 48605 | 16,31 |
| 12,20 | 102 | 51 | 1 | 48608 | 16,31 |
| 12,25 | 102 | 51 | 1 | 45560 | 15,27 |
| 12,50 | 102 | 51 | 1 | 25142 | 16,03 |
| 12,70 | 102 | 51 | 1 | 45563 | 16,68 |
| 13,00 | 102 | 51 | 1 | 25143 | 16,86 |
| 13,50 | 107 | 54 | 1 | 45392 | 21,78 |
| 14,00 | 107 | 54 | 1 | 45398 | 23,44 |
| 14,50 | 111 | 56 | 1 | 45419 | 26,01 |
| 15,00 | 111 | 56 | 1 | 45422 | 28,12 |
| 15,25 | 115 | 58 | 1 | 48800 | 38,21 |
| 15,50 | 115 | 58 | 1 | 45425 | 31,33 |
| 15,75 | 115 | 58 | 1 | 48791 | 38,21 |
| 16,00 | 115 | 58 | 1 | 45428 | 34,05 |
| 16,50 | 119 | 60 | 1 | 45572 | 40,07 |
| 17,00 | 119 | 60 | 1 | 45575 | 40,07 |
| 17,50 | 123 | 62 | 1 | 45577 | 44,65 |
| 18,00 | 123 | 62 | 1 | 45578 | 44,65 |
| 18,50 | 127 | 64 | 1 | 45585 | 49,70 |
| 19,00 | 127 | 64 | 1 | 45588 | 49,70 |
| 19,50 | 131 | 66 | 1 | 45597 | 59,61 |
| 20,00 | 131 | 66 | 1 | 45614 | 59,61 |

# Ref. 1050

## BROCA MANGO CILÍNDRICO HSS. SERIE EXTRA CORTA
HSS Straight Shank Drill Bit. Stub Series
Foret queue cylindrique HSS. Série extra-courte




HSS | DIN 1897 N | 135° | DIN 1412 C ≥ 2 mm | Blue Finish | **Rectificado Ground** Taillé meulé | Tol. D h8



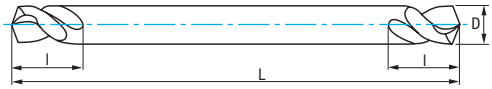

r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$ | Vf (mm/min.) = r.p.m. x f

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.1 | 25-30 | 0,045 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 | 0,180 | 0,250 |
| K | K.1 | 30-35 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 |
| | K.2 | 25-30 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,280 |
| N | N.3 | 60-80 | 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 | 0,450 |
| | N.4 | | 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 | 0,450 |
| | N.5 | 40-50 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 |

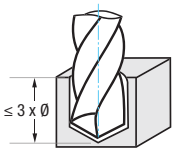
| | D mm | L mm | l mm | | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| | 1,00 | 26 | 6 | 10 | 20606 | 1,22 |
| New! | 1,10 | 28 | 7 | 10 | 48338 | 1,42 |
| New! | 1,20 | 30 | 8 | 10 | 48341 | 1,42 |
| | 1,25 | 30 | 8 | 10 | 20615 | 1,06 |
| New! | 1,30 | 30 | 8 | 10 | 48344 | 1,42 |
| New! | 1,40 | 32 | 9 | 10 | 48347 | 1,42 |
| | 1,50 | 32 | 9 | 10 | 12302 | 1,06 |
| | 1,60 | 34 | 10 | 10 | 12305 | 1,23 |
| New! | 1,70 | 34 | 10 | 10 | 48350 | 1,42 |
| | 1,75 | 36 | 11 | 10 | 12311 | 1,22 |
| | 1,80 | 36 | 11 | 10 | 12314 | 1,23 |
| | 1,90 | 36 | 11 | 10 | 12317 | 1,23 |
| | 2,00 | 38 | 12 | 10 | 12320 | 1,05 |
| | 2,10 | 40 | 13 | 10 | 12323 | 1,10 |
| | 2,20 | 40 | 13 | 10 | 12326 | 1,10 |
| | 2,25 | 40 | 13 | 10 | 12329 | 0,95 |
| | 2,30 | 40 | 13 | 10 | 12332 | 1,10 |
| | 2,40 | 43 | 14 | 10 | 12335 | 1,10 |
| | 2,50 | 43 | 14 | 10 | 12338 | 0,84 |
| | 2,60 | 43 | 14 | 10 | 12341 | 1,03 |
| | 2,70 | 46 | 16 | 10 | 12344 | 1,03 |
| | 2,75 | 46 | 16 | 10 | 12347 | 0,91 |
| | 2,80 | 46 | 16 | 10 | 12350 | 1,04 |
| | 2,90 | 46 | 16 | 10 | 12353 | 1,04 |
| | 3,00 | 46 | 16 | 10 | 12356 | 0,91 |
| New! | 3,10 | 49 | 18 | 10 | 12359 | 0,97 |
| | 3,20 | 49 | 18 | 10 | 12362 | 0,97 |
| | 3,25 | 49 | 18 | 10 | 12365 | 0,97 |
| New! | 3,30 | 49 | 18 | 10 | 12368 | 0,97 |
| | 3,40 | 52 | 20 | 10 | 12371 | 1,10 |
| | 3,50 | 52 | 20 | 10 | 12374 | 0,97 |
| New! | 3,60 | 52 | 20 | 10 | 12377 | 1,23 |
| New! | 3,70 | 52 | 20 | 10 | 12380 | 1,23 |
| | 3,75 | 52 | 20 | 10 | 12383 | 1,07 |
| | 3,80 | 55 | 22 | 10 | 12386 | 1,23 |
| New! | 3,90 | 55 | 22 | 10 | 12389 | 1,23 |
| | 4,00 | 55 | 22 | 10 | 12392 | 1,07 |
| New! | 4,10 | 55 | 22 | 10 | 12395 | 1,27 |
| New! | 4,20 | 55 | 22 | 10 | 12398 | 1,27 |
| | 4,25 | 55 | 22 | 10 | 12401 | 1,27 |
| New! | 4,30 | 58 | 24 | 10 | 12404 | 1,44 |
| New! | 4,40 | 58 | 24 | 10 | 12407 | 1,44 |
| | 4,50 | 58 | 24 | 10 | 12410 | 1,27 |
| New! | 4,60 | 58 | 24 | 10 | 20636 | 1,64 |
| | 4,70 | 58 | 24 | 10 | 20639 | 1,64 |
| New! | 4,75 | 58 | 24 | 10 | 12413 | 1,41 |
| New! | 4,80 | 62 | 26 | 10 | 12416 | 1,64 |
| | 4,90 | 62 | 26 | 10 | 12419 | 1,64 |
| | 5,00 | 62 | 26 | 10 | 12422 | 1,41 |
| | 5,10 | 62 | 26 | 10 | 12425 | 1,79 |
| | 5,20 | 62 | 26 | 10 | 12428 | 1,79 |
| | 5,25 | 62 | 26 | 10 | 12431 | 1,57 |
| | 5,30 | 62 | 26 | 10 | 12434 | 1,80 |
| | 5,40 | 66 | 28 | 10 | 12437 | 1,80 |
| | 5,50 | 66 | 28 | 10 | 12440 | 1,57 |
| | 5,60 | 66 | 28 | 10 | 12443 | 2,07 |
| | 5,70 | 66 | 28 | 10 | 12446 | 2,07 |
| | 5,75 | 66 | 28 | 10 | 12449 | 1,78 |
| | 5,80 | 66 | 28 | 10 | 12452 | 2,07 |
| | 5,90 | 66 | 28 | 10 | 12455 | 2,07 |
| | 6,00 | 66 | 28 | 10 | 12458 | 1,78 |
| | 6,10 | 70 | 31 | 10 | 20651 | 2,42 |
| | 6,20 | 70 | 31 | 10 | 20654 | 2,42 |
| | 6,25 | 70 | 31 | 10 | 12461 | 2,12 |
| | 6,30 | 70 | 31 | 10 | 20657 | 2,42 |
| | 6,40 | 70 | 31 | 10 | 20663 | 2,42 |
| | 6,50 | 70 | 31 | 10 | 12464 | 2,12 |
| | 6,60 | 70 | 31 | 10 | 20666 | 2,84 |
| | 6,70 | 70 | 31 | 10 | 20669 | 2,84 |
| | 6,75 | 74 | 34 | 10 | 12467 | 2,44 |
| | 6,80 | 74 | 34 | 10 | 20672 | 2,44 |
| New! | 6,90 | 74 | 34 | 10 | 48353 | 2,60 |
| | 7,00 | 74 | 34 | 10 | 12470 | 2,44 |
| New! | 7,10 | 74 | 34 | 10 | 48362 | 3,16 |
| | 7,20 | 74 | 34 | 10 | 20681 | 3,16 |
| | 7,25 | 74 | 34 | 10 | 27317 | 2,78 |
| New! | 7,30 | 74 | 34 | 10 | 48365 | 3,06 |
| | 7,40 | 74 | 34 | 10 | 30591 | 3,06 |
| | 7,50 | 74 | 34 | 10 | 12473 | 2,78 |
| New! | 7,60 | 79 | 37 | 10 | 48368 | 3,51 |
| New! | 7,70 | 79 | 37 | 10 | 48383 | 3,51 |
| | 7,75 | 79 | 37 | 10 | 12476 | 3,06 |
| | 7,80 | 79 | 37 | 10 | 20696 | 3,51 |
| New! | 7,90 | 79 | 37 | 10 | 48386 | 3,51 |
| | 8,00 | 79 | 37 | 10 | 12479 | 3,06 |
| New! | 8,10 | 79 | 37 | 10 | 48389 | 4,08 |
| New! | 8,20 | 79 | 37 | 10 | 48392 | 4,08 |
| | 8,25 | 79 | 37 | 10 | 12482 | 3,64 |
| New! | 8,30 | 79 | 37 | 10 | 48395 | 4,08 |
| New! | 8,40 | 79 | 37 | 10 | 48398 | 4,08 |
| | 8,50 | 79 | 37 | 10 | 12485 | 3,64 |
| New! | 8,70 | 84 | 40 | 10 | 20720 | 4,22 |
| | 8,75 | 84 | 40 | 10 | 12488 | 3,99 |
| New! | 8,80 | 84 | 40 | 10 | 48401 | 4,22 |
| New! | 8,90 | 84 | 40 | 10 | 48404 | 4,22 |
| | 9,00 | 84 | 40 | 10 | 12491 | 3,99 |
| | 9,10 | 84 | 40 | 10 | 30592 | 4,96 |
| New! | 9,20 | 84 | 40 | 10 | 48407 | 4,96 |
| | 9,25 | 84 | 40 | 10 | 12494 | 4,45 |
| New! | 9,30 | 84 | 40 | 10 | 48410 | 4,96 |
| New! | 9,40 | 84 | 40 | 10 | 48413 | 4,96 |
| | 9,50 | 84 | 40 | 10 | 12497 | 4,45 |
| New! | 9,60 | 89 | 43 | 10 | 48416 | 6,80 |
| New! | 9,70 | 89 | 43 | 10 | 48419 | 6,80 |
| | 9,75 | 89 | 43 | 10 | 27334 | 4,96 |
| New! | 9,80 | 89 | 43 | 10 | 48422 | 5,25 |
| New! | 9,90 | 89 | 43 | 10 | 48335 | 5,25 |
| | 10,00 | 89 | 43 | 10 | 12500 | 4,96 |
| New! | 10,10 | 89 | 43 | 1 | 48428 | 6,02 |
| New! | 10,15 | 89 | 43 | 1 | 16195 | 6,02 |
| | 10,20 | 89 | 43 | 1 | 20756 | 5,62 |
| | 10,25 | 89 | 43 | 1 | 12503 | 6,23 |
| New! | 10,30 | 89 | 43 | 1 | 48431 | 6,60 |
| | 10,50 | 89 | 43 | 1 | 12506 | 5,62 |
| New! | 10,80 | 95 | 47 | 1 | 48434 | 7,11 |
| | 11,00 | 95 | 47 | 1 | 12512 | 6,23 |
| | 11,10 | 95 | 47 | 1 | 30593 | 7,33 |
| New! | 11,20 | 95 | 47 | 1 | 48437 | 7,33 |
| | 11,25 | 95 | 47 | 1 | 12515 | 6,93 |
| | 11,50 | 95 | 47 | 1 | 12518 | 6,93 |
| New! | 11,80 | 95 | 47 | 1 | 48449 | 8,85 |
| | 12,00 | 102 | 51 | 1 | 12527 | 7,33 |
| New! | 12,10 | 102 | 51 | 1 | 48452 | 9,32 |
| New! | 12,20 | 102 | 51 | 1 | 48455 | 9,32 |
| | 12,25 | 102 | 51 | 1 | 12530 | 8,25 |
| | 12,50 | 102 | 51 | 1 | 12533 | 8,25 |
| | 12,70 | 102 | 51 | 1 | 20813 | 8,68 |
| | 13,00 | 102 | 51 | 1 | 12539 | 9,01 |
| | 13,50 | 107 | 54 | 1 | 12545 | 11,45 |
| | 14,00 | 107 | 54 | 1 | 12551 | 12,37 |
| | 14,50 | 111 | 56 | 1 | 12554 | 14,13 |
| | 15,00 | 111 | 56 | 1 | 12557 | 16,15 |
| New! | 15,25 | 115 | 58 | 1 | 48797 | 23,74 |
| | 15,50 | 115 | 58 | 1 | 12560 | 19,46 |
| New! | 15,75 | 115 | 58 | 1 | 20834 | 23,74 |
| | 16,00 | 115 | 58 | 1 | 12563 | 19,46 |
| | 16,50 | 119 | 60 | 1 | 12566 | 22,90 |
| | 17,00 | 119 | 60 | 1 | 12569 | 22,90 |
| | 17,50 | 123 | 62 | 1 | 12572 | 25,51 |
| | 18,00 | 123 | 62 | 1 | 12575 | 25,51 |
| | 18,50 | 127 | 64 | 1 | 12578 | 28,40 |
| | 19,00 | 127 | 64 | 1 | 12581 | 28,40 |
| | 19,50 | 131 | 66 | 1 | 12584 | 34,06 |
| | 20,00 | 131 | 66 | 1 | 12587 | 34,06 |

# Ref. 1660

## BROCA MANGO CILÍNDRICO DOBLE CHAPA HSS. SERIE EXTRA CORTA
HSS Double Sheet Straight Shank Drill Bit. Stub Series
Foret queue cylindrique double tole HSS. Série extra-courte




HSS | IZAR Std. | 135° | | | Chapa Sheets < 4 mm Tôle | Blue Finish | **Rectificado Ground** Taillé meulé | Tol. D h8

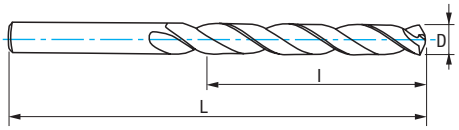



| | D mm | L mm | l mm | | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| | **2,00** | 38 | 9 | 10 | 16028 | **1,92** |
| | **2,20** | 40 | 9 | 10 | 27607 | **1,76** |
| New! | **2,25** | 43 | 10 | 10 | 16031 | **2,01** |
| | **2,30** | 43 | 10 | 10 | 25604 | **2,27** |
| New! | **2,40** | 43 | 10 | 10 | 25607 | **2,27** |
| | **2,50** | 43 | 10 | 10 | 16034 | **1,90** |
| New! | **2,75** | 46 | 13 | 10 | 16037 | **1,78** |
| | **2,80** | 46 | 13 | 10 | 16040 | **1,78** |
| | **2,90** | 46 | 13 | 10 | 16043 | **1,78** |
| | **3,00** | 46 | 13 | 10 | 16046 | **1,65** |
| | **3,10** | 52 | 14 | 10 | 16049 | **1,65** |
| | **3,20** | 52 | 14 | 10 | 16052 | **1,65** |
| | **3,25** | 52 | 14 | 10 | 16055 | **1,65** |
| | **3,30** | 52 | 14 | 10 | 16058 | **1,65** |
| | **3,40** | 52 | 14 | 10 | 16061 | **1,84** |
| | **3,50** | 52 | 14 | 10 | 16064 | **1,84** |
| | **3,70** | 55 | 15 | 10 | 16067 | **2,05** |
| | **3,75** | 55 | 15 | 10 | 16070 | **2,11** |
| | **3,80** | 55 | 15 | 10 | 16073 | **2,05** |
| | **4,00** | 55 | 15 | 10 | 16076 | **1,90** |
| | **4,10** | 58 | 16 | 10 | 16079 | **2,05** |
| | **4,20** | 58 | 16 | 10 | 16082 | **2,05** |

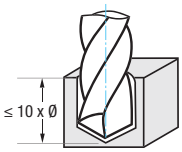
| | D mm | L mm | l mm | | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| | **4,25** | 58 | 16 | 10 | 16085 | **2,05** |
| | **4,50** | 58 | 16 | 10 | 16088 | **2,11** |
| | **4,75** | 62 | 18 | 10 | 16094 | **3,42** |
| | **4,80** | 62 | 18 | 10 | 16097 | **2,34** |
| | **4,90** | 62 | 18 | 10 | 16100 | **2,34** |
| | **5,00** | 62 | 18 | 10 | 16103 | **2,41** |
| | **5,10** | 66 | 19 | 10 | 16106 | **3,30** |
| | **5,20** | 66 | 19 | 10 | 16109 | **3,30** |
| | **5,25** | 66 | 19 | 10 | 16112 | **3,42** |
| | **5,50** | 66 | 19 | 10 | 16115 | **2,93** |
| | **5,70** | 66 | 19 | 10 | 25634 | **3,87** |
| | **5,75** | 66 | 19 | 10 | 16121 | **4,04** |
| | **6,00** | 66 | 19 | 10 | 16127 | **3,28** |
| New! | **6,10** | 70 | 21 | 10 | 25640 | **4,42** |
| New! | **6,20** | 70 | 21 | 10 | 25643 | **4,42** |
| | **6,50** | 70 | 21 | 10 | 16133 | **3,62** |
| | **7,00** | 74 | 24 | 10 | 16136 | **4,32** |
| | **7,40** | 74 | 24 | 10 | 25664 | **5,93** |
| | **7,50** | 74 | 24 | 10 | 16139 | **4,41** |
| | **8,00** | 79 | 25 | 10 | 16142 | **5,27** |
| | **9,00** | 84 | 25 | 10 | 16148 | **7,06** |
| | **10,00** | 89 | 27 | 10 | 16154 | **7,59** |

# Ref. 1036

## BROCA MANGO CILÍNDRICO MATERIALES DUROS. SERIE LARGA
Hard Materials Straight Shank Drill Bit. Long Series
Foret queue cylindrique matériaux durs. Série longue




HSSE 5%Co | DIN 340 N | 135° | **Ambar Gold Finish** Finition or | **Rectificado Ground** Taillé meulé | **A.R.I.*** Alto Rendimiento Intensivo **I.H.P.*** Intensive High Performance H.P.I.* Haute Performance Intensif | Tol. D h8




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 |
| P | P.3 | 8-15 | 0,020 | 0,035 | 0,045 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 |
| | P.5 | 8-12 | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 | 0,150 |
| S | | 10-15 | 0,020 | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,080 | 0,100 | 0,120 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

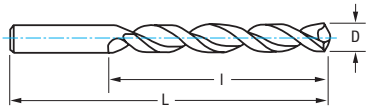
*** Se recomienda reducir el avance entre 2/3 y 1/2**
*** It is recommended to reduce feed between 2/3 & 1/2**
* On conseille réduire l´avance entre 2/3 et 1/2

| D mm | L mm | l mm | | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **2,00** | 85 | 56 | 10 | 21375 | **4,84** |
| **2,50** | 95 | 62 | 10 | 21377 | **4,40** |
| **3,00** | 100 | 66 | 10 | 21378 | **4,40** |
| **3,10** | 106 | 69 | 10 | 21694 | **5,02** |
| **3,20** | 106 | 69 | 10 | 15102 | **5,02** |
| **3,25** | 106 | 69 | 10 | 21379 | **5,02** |
| **3,30** | 106 | 69 | 10 | 27030 | **5,02** |
| **3,50** | 112 | 73 | 10 | 21380 | **5,17** |
| **3,70** | 112 | 73 | 10 | 15118 | **6,31** |
| **3,75** | 112 | 73 | 10 | 21381 | **5,92** |
| **4,00** | 119 | 78 | 10 | 21382 | **5,35** |
| **4,10** | 119 | 78 | 10 | 33246 | **5,92** |
| **4,20** | 119 | 78 | 10 | 15186 | **5,92** |
| **4,25** | 119 | 78 | 10 | 21383 | **5,92** |
| **4,50** | 126 | 82 | 10 | 21384 | **6,60** |
| **4,75** | 126 | 82 | 10 | 21385 | **6,62** |
| **5,00** | 132 | 87 | 10 | 21386 | **6,60** |
| **5,25** | 132 | 87 | 10 | 21904 | **7,85** |
| **5,50** | 139 | 91 | 10 | 21387 | **9,04** |
| **5,75** | 139 | 91 | 10 | 21776 | **9,08** |

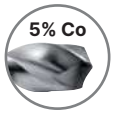
| D mm | L mm | l mm | | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **6,00** | 139 | 91 | 10 | 21388 | **9,04** |
| **6,50** | 148 | 97 | 5 | 21389 | **10,36** |
| **6,75** | 156 | 102 | 5 | 21905 | **12,04** |
| **6,80** | 156 | 102 | 5 | 27031 | **12,04** |
| **7,00** | 156 | 102 | 5 | 21393 | **12,11** |
| **7,50** | 156 | 102 | 5 | 21394 | **12,86** |
| **8,00** | 165 | 109 | 5 | 21395 | **14,35** |
| **8,50** | 165 | 109 | 5 | 21396 | **15,94** |
| **8,60** | 175 | 115 | 5 | 27032 | **22,76** |
| **9,00** | 175 | 115 | 5 | 21397 | **17,33** |
| **9,50** | 175 | 115 | 5 | 21398 | **17,53** |
| **10,00** | 184 | 121 | 5 | 21399 | **18,91** |
| **10,20** | 184 | 121 | 1 | 27033 | **25,59** |
| **10,25** | 184 | 121 | 1 | 21906 | **27,86** |
| **10,50** | 184 | 121 | 1 | 21400 | **25,59** |
| **11,00** | 195 | 128 | 1 | 21401 | **28,44** |
| **11,50** | 195 | 128 | 1 | 21402 | **29,91** |
| **12,00** | 205 | 134 | 1 | 21403 | **32,40** |
| **12,50** | 205 | 134 | 1 | 21404 | **38,96** |
| **13,00** | 205 | 134 | 1 | 21406 | **39,91** |

# Ref. 1300

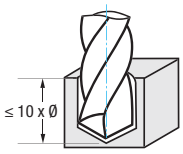
## BROCA MANGO CILÍNDRICO AGUJEROS TOLERANCIA IT8-9. SERIE LARGA
IT8-9 Tolerance Hole Straight Shank Drill Bit. Long Series
Foret queue cylindrique trous tolérance IT8-9. Série longue




HSSE 5%Co | HSSE 5%Co + TIALSIN | DIN 340 TS | 135° | Filo Corregido Convex Edge "U" Filets Corrigés | Perfil Profile Profil "S" | Rectificado Ground Taillé meulé | Tol. D h8



x3,5 **Resistencia al desgaste**
**Wear Resistance**
Résistant à l'usure




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x f**

* **Se recomienda reducir el avance entre 2/3 y 1/2**
* **It is recommended to reduce feed between 2/3 & 1/2**
* On conseille réduire l´avance entre 2/3 et 1/2

| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | 5% Co | TIALSIN |
| P | P.2 | 20-25 | 28-35 |
| | P.3 | 8-15 | 12-20 |
| K | K.1 | 30-35 | 36-42 |
| | K.2 | 25-30 | 30-36 |
| N | N.5 | 40-50 | 56-70 |
| | N.6 | 35-45 | 40-58 |

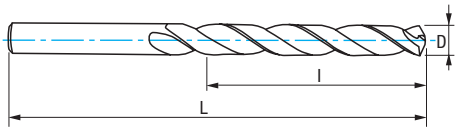
| Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 |
| 0,035 | 0,045 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 | 0,130 | 0,160 |
| 0,020 | 0,035 | 0,045 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 |
| 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 |
| 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 |
| 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 |
| 0,080 | 0,130 | 0,150 | 0,170 | 0,190 | 0,250 | 0,290 | 0,310 | 0,360 |

| D mm | L mm | l mm | | N° Art. 5% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|
| 2,00 | 85 | 56 | 1 | 22254 | 7,71 | 14389 | 9,41 |
| 2,10 | 85 | 56 | 1 | 14539 | 7,21 | 24875 | 8,73 |
| 2,30 | 90 | 59 | 1 | 14541 | 7,48 | 24897 | 9,00 |
| 2,50 | 95 | 62 | 1 | 22255 | 7,02 | 14391 | 8,56 |
| 2,70 | 100 | 66 | 1 | 14551 | 7,88 | 24877 | 9,41 |
| 2,75 | 100 | 66 | 1 | 14470 | 8,02 | 24878 | 9,56 |
| 3,00 | 100 | 66 | 1 | 22256 | 7,02 | 14392 | 8,58 |
| 3,10 | 106 | 69 | 1 | 14553 | 8,02 | 14616 | 10,04 |
| 3,20 | 106 | 69 | 1 | 22257 | 8,02 | 14393 | 10,04 |
| 3,25 | 106 | 69 | 1 | 14472 | 8,02 | 14488 | 10,04 |
| 3,30 | 106 | 69 | 1 | 14556 | 8,02 | 14617 | 10,04 |
| 3,50 | 112 | 73 | 1 | 22258 | 8,30 | 14395 | 10,32 |
| 3,60 | 112 | 73 | 1 | 14928 | 9,75 | 23335 | 11,72 |
| 3,70 | 112 | 73 | 1 | 14563 | 10,10 | 24879 | 12,06 |
| 3,75 | 112 | 73 | 1 | 14473 | 9,47 | 24880 | 11,45 |
| 3,90 | 119 | 78 | 1 | 14665 | 10,69 | 24881 | 12,66 |
| 4,00 | 119 | 78 | 1 | 22260 | 8,55 | 14396 | 10,56 |
| 4,10 | 119 | 78 | 1 | 14569 | 9,47 | 14619 | 11,45 |
| 4,20 | 119 | 78 | 1 | 22261 | 9,47 | 14397 | 11,45 |
| 4,25 | 119 | 78 | 1 | 14476 | 9,47 | 14490 | 11,45 |
| 4,30 | 126 | 82 | 1 | 14571 | 10,58 | 14623 | 12,46 |
| 4,40 | 126 | 82 | 1 | 14670 | 10,94 | 24882 | 12,89 |
| 4,50 | 126 | 82 | 1 | 22262 | 10,59 | 14398 | 12,54 |
| 4,70 | 126 | 82 | 1 | 14671 | 10,45 | 24883 | 12,43 |
| 4,75 | 126 | 82 | 1 | 14481 | 10,60 | 24884 | 12,56 |
| 4,80 | 132 | 87 | 1 | 14673 | 10,94 | 24885 | 12,89 |
| 5,00 | 132 | 87 | 1 | 22263 | 10,59 | 14409 | 12,54 |
| 5,10 | 132 | 87 | 1 | 22264 | 12,35 | 14415 | 14,18 |

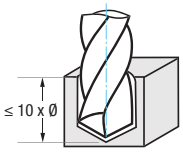
| D mm | L mm | l mm | | N° Art. 5% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|
| 5,20 | 132 | 87 | 1 | 14575 | 12,35 | 24886 | 14,24 |
| 5,25 | 132 | 87 | 1 | 14484 | 12,78 | 14493 | 14,67 |
| 5,30 | 132 | 87 | 1 | 14679 | 12,78 | 24887 | 14,66 |
| 5,50 | 139 | 91 | 1 | 22265 | 14,47 | 14416 | 16,30 |
| 5,60 | 139 | 91 | 1 | 14685 | 14,77 | 24888 | 16,62 |
| 5,75 | 139 | 91 | 1 | 14487 | 14,54 | 24889 | 16,39 |
| 5,80 | 139 | 91 | 1 | 14580 | 15,13 | 24890 | 16,97 |
| 5,90 | 139 | 91 | 1 | 14689 | 15,33 | 24891 | 17,16 |
| 6,00 | 139 | 91 | 1 | 22266 | 14,47 | 14419 | 16,30 |
| 6,20 | 148 | 97 | 1 | 14581 | 18,73 | 24892 | 24,22 |
| 6,50 | 148 | 97 | 1 | 22267 | 16,59 | 14427 | 22,15 |
| 6,80 | 156 | 102 | 1 | 14586 | 19,28 | 14625 | 24,77 |
| 7,00 | 156 | 102 | 1 | 22268 | 19,36 | 14428 | 25,10 |
| 7,20 | 156 | 102 | 1 | 14691 | 23,48 | 24893 | 29,10 |
| 7,50 | 156 | 102 | 1 | 14587 | 20,57 | 14628 | 26,26 |
| 8,00 | 165 | 109 | 1 | 22269 | 22,95 | 14431 | 28,57 |
| 8,20 | 165 | 109 | 1 | 14593 | 25,83 | 24894 | 32,41 |
| 8,50 | 165 | 109 | 1 | 22270 | 25,49 | 14434 | 32,09 |
| 8,80 | 175 | 115 | 1 | 14695 | 27,55 | 24895 | 34,11 |
| 9,00 | 175 | 115 | 1 | 22271 | 27,72 | 14437 | 34,27 |
| 9,50 | 175 | 115 | 1 | 14598 | 28,06 | 14629 | 34,58 |
| 9,80 | 184 | 121 | 1 | 14697 | 47,56 | 24896 | 53,52 |
| 10,00 | 184 | 121 | 1 | 22272 | 30,25 | 14439 | 36,73 |
| 10,50 | 184 | 121 | 1 | 14701 | 40,94 | 14713 | 54,61 |
| 11,00 | 195 | 128 | 1 | 22273 | 45,51 | 14440 | 59,03 |
| 11,50 | 195 | 128 | 1 | 14707 | 47,85 | 14719 | 60,77 |
| 12,00 | 205 | 134 | 1 | 22274 | 51,86 | 14443 | 64,63 |
| 13,00 | 205 | 134 | 1 | 22275 | 63,87 | 14445 | 80,11 |

# Ref. 1030

## BROCA MANGO CILÍNDRICO HSS. SERIE LARGA
HSS Straight Shank Drill Bit. Long Series
Foret queue cylindrique HSS. Série longue




HSS | HSS + TIN | DIN 340 N | 118° | Blue Finish | **Rectificado Ground** Taillé meulé | Tol. D h8




| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | HSS | TIN |
| P | P.1 | 25-30 | 30-35 |
| K | K.1 | 30-35 | 36-42 |
| | K.2 | 25-30 | 30-36 |
| N | N.3 | 60-80 | 72-96 |
| | N.4 | | |
| | N.5 | 40-50 | 48-60 |

| Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| 0,045 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 | 0,180 | 0,250 |
| 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 |
| 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,280 |
| 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 | 0,450 |
| 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 | 0,450 |
| 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

* **Se recomienda reducir el avance entre 2/3 y 1/2**
* **It is recommended to reduce feed between 2/3 & 1/2**
* On conseille réduire l´avance entre 2/3 et 1/2

| D mm | L mm | l mm | | N° Art. HSS | € | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|
| 0,50 | 32 | 12 | 10 | 26656 | 5,77 | | |
| 0,60 | 35 | 15 | 10 | 26658 | 4,69 | | |
| 0,70 | 42 | 21 | 10 | 19467 | 4,69 | | |
| 0,80 | 46 | 25 | 10 | 24592 | 4,69 | | |
| 0,90 | 51 | 29 | 10 | 26659 | 4,69 | | |
| 1,00 | 56 | 33 | 10 | 11573 | 4,74 | 27465 | 5,73 |
| 1,10 | 60 | 37 | 10 | 11576 | 4,60 | 27466 | 5,60 |
| 1,20 | 65 | 41 | 10 | 11579 | 4,60 | 27467 | 5,60 |
| 1,25 | 65 | 41 | 10 | 11582 | 4,75 | 27468 | 5,76 |
| 1,30 | 65 | 41 | 10 | 11585 | 4,60 | 27111 | 5,60 |
| 1,40 | 70 | 45 | 10 | 11588 | 4,60 | 27469 | 5,60 |
| New! 1,45 | 70 | 45 | 10 | 31704 | 4,60 | 31706 | 5,60 |
| 1,50 | 70 | 45 | 10 | 11591 | 3,42 | 27470 | 4,43 |
| 1,60 | 76 | 50 | 10 | 11594 | 4,60 | 27471 | 5,60 |
| 1,70 | 76 | 50 | 10 | 11597 | 4,60 | 27472 | 5,60 |
| 1,75 | 80 | 53 | 10 | 11600 | 3,81 | 27473 | 4,81 |
| 1,80 | 80 | 53 | 10 | 11603 | 3,66 | 27141 | 4,71 |
| 1,90 | 80 | 53 | 10 | 11606 | 3,66 | 27474 | 4,71 |
| 2,00 | 85 | 56 | 10 | 11609 | 2,42 | 27145 | 3,52 |
| 2,10 | 85 | 56 | 10 | 11612 | 3,34 | 27146 | 4,28 |
| 2,20 | 90 | 59 | 10 | 11615 | 3,34 | 27475 | 4,28 |
| 2,25 | 90 | 59 | 10 | 11618 | 2,67 | 27476 | 3,63 |
| 2,30 | 90 | 59 | 10 | 11621 | 3,21 | 27142 | 4,17 |
| 2,40 | 95 | 62 | 10 | 11624 | 3,21 | 27477 | 4,17 |
| 2,50 | 95 | 62 | 10 | 11627 | 2,42 | 27478 | 3,39 |
| 2,60 | 95 | 62 | 10 | 11630 | 3,21 | 27479 | 4,17 |
| 2,70 | 100 | 66 | 10 | 11633 | 3,21 | 27144 | 4,17 |
| 2,75 | 100 | 66 | 10 | 11636 | 3,34 | 27480 | 4,29 |
| 2,80 | 100 | 66 | 10 | 11639 | 3,21 | 27143 | 4,17 |
| 2,90 | 100 | 66 | 10 | 11642 | 3,21 | 27147 | 4,17 |
| 3,00 | 100 | 66 | 10 | 11645 | 2,26 | 20132 | 3,22 |
| 3,10 | 106 | 69 | 10 | 11648 | 2,50 | 27220 | 3,74 |
| 3,20 | 106 | 69 | 10 | 11651 | 2,50 | 27217 | 3,74 |
| 3,25 | 106 | 69 | 10 | 11654 | 2,50 | 27213 | 3,74 |

| D mm | L mm | l mm | | N° Art. HSS | € | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|
| 3,30 | 106 | 69 | 10 | 11657 | 2,50 | 27210 | 3,74 |
| 3,40 | 112 | 73 | 10 | 11660 | 3,21 | 27167 | 4,42 |
| 3,50 | 112 | 73 | 10 | 11663 | 2,37 | 27211 | 3,61 |
| 3,60 | 112 | 73 | 10 | 11666 | 3,21 | 27515 | 4,42 |
| 3,70 | 112 | 73 | 10 | 11669 | 3,21 | 28267 | 4,42 |
| 3,75 | 112 | 73 | 10 | 11672 | 3,34 | 27218 | 4,58 |
| 3,80 | 119 | 78 | 10 | 11675 | 4,01 | 27221 | 5,20 |
| 3,90 | 119 | 78 | 10 | 11678 | 4,01 | 27222 | 5,20 |
| 4,00 | 119 | 78 | 10 | 11681 | 2,56 | 27216 | 3,82 |
| 4,10 | 119 | 78 | 10 | 11684 | 3,36 | 27219 | 4,59 |
| 4,20 | 119 | 78 | 10 | 11687 | 3,36 | 27224 | 4,59 |
| 4,25 | 119 | 78 | 10 | 11690 | 3,36 | 27214 | 4,59 |
| 4,30 | 126 | 82 | 10 | 11693 | 4,34 | 27215 | 5,53 |
| 4,40 | 126 | 82 | 10 | 11696 | 4,34 | 27481 | 5,53 |
| 4,50 | 126 | 82 | 10 | 11699 | 3,06 | 27089 | 4,30 |
| 4,60 | 126 | 82 | 10 | 11702 | 4,34 | 27212 | 5,53 |
| 4,70 | 126 | 82 | 10 | 19955 | 4,34 | 27482 | 5,53 |
| 4,75 | 126 | 82 | 10 | 11705 | 4,52 | 76657 | 5,70 |
| 4,80 | 132 | 87 | 10 | 11708 | 5,02 | 27483 | 6,19 |
| 4,90 | 132 | 87 | 10 | 11711 | 5,02 | 27484 | 6,19 |
| 5,00 | 132 | 87 | 10 | 11714 | 3,29 | 27103 | 4,51 |
| 5,10 | 132 | 87 | 10 | 11717 | 5,02 | 27155 | 6,19 |
| 5,20 | 132 | 87 | 10 | 11720 | 5,02 | 27101 | 6,19 |
| 5,25 | 132 | 87 | 10 | 11723 | 5,20 | 27104 | 6,38 |
| 5,30 | 132 | 87 | 10 | 11726 | 5,45 | 76658 | 6,63 |
| 5,40 | 139 | 91 | 10 | 11729 | 5,45 | 27153 | 6,63 |
| 5,50 | 139 | 91 | 10 | 11732 | 4,33 | 27152 | 5,51 |
| 5,60 | 139 | 91 | 10 | 11735 | 5,45 | 27109 | 6,63 |
| 5,70 | 139 | 91 | 10 | 11738 | 5,45 | 27107 | 6,63 |
| 5,75 | 139 | 91 | 10 | 11741 | 5,67 | 27114 | 6,82 |
| 5,80 | 139 | 91 | 10 | 11744 | 6,00 | 27100 | 7,14 |
| 5,90 | 139 | 91 | 10 | 11747 | 6,00 | 27282 | 7,14 |
| 6,00 | 139 | 91 | 10 | 11750 | 4,02 | 27168 | 5,22 |
| 6,10 | 148 | 97 | 10 | 11753 | 6,00 | 27105 | 9,36 |

# Ref. 1030

## BROCA MANGO CILÍNDRICO HSS. SERIE LARGA
HSS Straight Shank Drill Bit. Long Series
Foret queue cylindrique HSS. Série longue

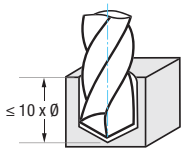
| D mm | L mm | l mm | | N° Art. HSS | € | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|
| **6,20** | 148 | 97 | 10 | 11756 | **6,00** | 27281 | **9,36** |
| **6,25** | 148 | 97 | 10 | 11759 | **6,22** | 27485 | **9,58** |
| **6,30** | 148 | 97 | 10 | 11762 | **6,07** | 27486 | **9,39** |
| **6,40** | 148 | 97 | 10 | 11765 | **6,07** | 27108 | **9,39** |
| **6,50** | 148 | 97 | 10 | 11768 | **5,14** | 20135 | **8,51** |
| **6,60** | 148 | 97 | 10 | 11771 | **6,07** | 27169 | **9,39** |
| **6,70** | 148 | 97 | 10 | 11774 | **6,07** | 27283 | **9,39** |
| **6,75** | 156 | 102 | 10 | 11777 | **6,29** | 27487 | **9,62** |
| **6,80** | 156 | 102 | 10 | 11780 | **6,29** | 27160 | **9,62** |
| **6,90** | 156 | 102 | 10 | 11783 | **6,44** | 27106 | **9,79** |
| **7,00** | 156 | 102 | 10 | 11786 | **5,99** | 20138 | **9,35** |
| **7,10** | 156 | 102 | 10 | 11789 | **6,44** | 27158 | **9,79** |
| **7,20** | 156 | 102 | 10 | 11792 | **6,44** | 27488 | **9,79** |
| **7,25** | 156 | 102 | 10 | 11795 | **6,70** | 27159 | **10,02** |
| **7,30** | 156 | 102 | 10 | 11798 | **6,57** | 76659 | **9,90** |
| **7,40** | 156 | 102 | 10 | 11801 | **6,57** | 27489 | **9,90** |
| **7,50** | 156 | 102 | 10 | 11804 | **6,38** | 27490 | **9,71** |
| **7,60** | 165 | 109 | 10 | 11807 | **6,57** | 20141 | **9,90** |
| **7,70** | 165 | 109 | 10 | 11810 | **6,57** | 27157 | **9,90** |
| **7,75** | 165 | 109 | 10 | 11813 | **6,83** | 27491 | **10,15** |
| **7,80** | 165 | 109 | 10 | 11816 | **7,35** | 27154 | **10,65** |
| **7,90** | 165 | 109 | 10 | 11819 | **7,35** | 27232 | **10,65** |
| **8,00** | 165 | 109 | 10 | 11822 | **7,11** | 27492 | **10,42** |
| **8,10** | 165 | 109 | 5 | 11825 | **7,35** | 27493 | **11,29** |
| **8,20** | 165 | 109 | 5 | 11828 | **7,35** | 27494 | **11,29** |
| **8,25** | 165 | 109 | 5 | 11831 | **7,63** | 28850 | **11,54** |
| **8,30** | 165 | 109 | 5 | 11834 | **11,30** | 27495 | **15,12** |
| **8,40** | 165 | 109 | 5 | 11837 | **11,30** | 20144 | **15,12** |
| **8,50** | 165 | 109 | 5 | 11840 | **7,90** | 27496 | **11,82** |
| **8,60** | 175 | 115 | 5 | 11843 | **11,30** | 27284 | **15,12** |
| **8,70** | 175 | 115 | 5 | 11846 | **11,30** | 27516 | **15,12** |
| **8,75** | 175 | 115 | 5 | 11849 | **11,76** | 27285 | **15,54** |
| **8,80** | 175 | 115 | 5 | 11852 | **11,55** | 27497 | **15,36** |
| **8,90** | 175 | 115 | 5 | 11855 | **11,55** | 27517 | **15,36** |
| **9,00** | 175 | 115 | 5 | 11858 | **8,59** | 27113 | **12,50** |
| **9,10** | 175 | 115 | 5 | 11861 | **11,55** | 27110 | **15,36** |
| **9,20** | 175 | 115 | 5 | 11864 | **11,55** | 27231 | **15,36** |
| **9,25** | 175 | 115 | 5 | 11867 | **12,01** | 27498 | **15,79** |
| **9,30** | 175 | 115 | 5 | 11870 | **12,44** | 27112 | **16,22** |
| **9,40** | 175 | 115 | 5 | 11873 | **12,44** | 27499 | **16,22** |
| **9,50** | 175 | 115 | 5 | 11876 | **8,70** | 27500 | **12,58** |
| **9,60** | 184 | 121 | 5 | 11879 | **12,44** | 27501 | **16,22** |
| **9,70** | 184 | 121 | 5 | 11882 | **12,44** | 27502 | **16,22** |
| **9,75** | 184 | 121 | 5 | 11885 | **12,91** | 27503 | **16,65** |
| **9,80** | 184 | 121 | 5 | 11888 | **12,44** | 27504 | **16,22** |
| **9,90** | 184 | 121 | 5 | 11891 | **12,44** | 26994 | **16,22** |
| **10,00** | 184 | 121 | 5 | 11894 | **9,40** | 20147 | **13,27** |

| | D mm | L mm | l mm | | N° Art. HSS | € | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|---|
| | **10,20** | 184 | 121 | 1 | 11900 | **12,70** | 20150 | **20,98** |
| | **10,25** | 184 | 121 | 1 | 11903 | **11,76** | 27230 | **20,06** |
| | **10,50** | 184 | 121 | 1 | 11912 | **12,70** | 27229 | **20,98** |
| | **10,75** | 195 | 128 | 1 | 11921 | **12,91** | 27505 | **21,18** |
| | **10,80** | 195 | 128 | 1 | 11924 | **16,15** | 26996 | **24,34** |
| | **11,00** | 195 | 128 | 1 | 11930 | **14,12** | 27228 | **22,34** |
| | **11,10** | 195 | 128 | 1 | 30588 | **18,88** | 30589 | **26,96** |
| | **11,25** | 195 | 128 | 1 | 11939 | **16,78** | 27506 | **24,94** |
| | **11,50** | 195 | 128 | 1 | 11948 | **14,39** | 27227 | **22,59** |
| | **11,75** | 195 | 128 | 1 | 11957 | **18,88** | 27225 | **26,97** |
| | **11,80** | 195 | 128 | 1 | 11960 | **18,88** | 27507 | **26,97** |
| | **11,90** | 205 | 134 | 1 | 11963 | **18,88** | 27508 | **26,97** |
| | **12,00** | 205 | 134 | 1 | 11966 | **16,08** | 27509 | **24,28** |
| | **12,20** | 205 | 134 | 1 | 11972 | **18,19** | 26993 | **28,50** |
| | **12,25** | 205 | 134 | 1 | 11975 | **18,24** | 27510 | **28,54** |
| | **12,30** | 205 | 134 | 1 | 11978 | **21,50** | 27511 | **31,74** |
| | **12,50** | 205 | 134 | 1 | 11984 | **16,93** | 27512 | **27,31** |
| | **12,75** | 205 | 134 | 1 | 11993 | **22,34** | 27513 | **32,55** |
| | **13,00** | 205 | 134 | 1 | 12002 | **19,22** | 27226 | **29,51** |
| | **13,25** | 214 | 140 | 1 | 12005 | **22,34** | | |
| | **13,50** | 214 | 140 | 1 | 12008 | **21,45** | 12933 | **31,67** |
| | **13,75** | 214 | 140 | 1 | 12011 | **22,40** | 17836 | **32,63** |
| | **14,00** | 214 | 140 | 1 | 12014 | **23,15** | 12935 | **33,34** |
| | **14,25** | 220 | 144 | 1 | 12017 | **41,70** | 17837 | **51,36** |
| | **14,50** | 220 | 144 | 1 | 12020 | **27,12** | 12936 | **37,16** |
| | **14,75** | 220 | 144 | 1 | 12023 | **41,70** | | |
| | **15,00** | 220 | 144 | 1 | 12026 | **26,22** | 12939 | **36,33** |
| | **15,25** | 227 | 149 | 1 | 12029 | **47,10** | | |
| | **15,50** | 227 | 149 | 1 | 12032 | **38,93** | | |
| | **15,75** | 227 | 149 | 1 | 12035 | **47,10** | | |
| | **16,00** | 227 | 149 | 1 | 12038 | **30,53** | 21320 | **38,29** |
| | **16,25** | 235 | 154 | 1 | 12041 | **51,98** | | |
| | **16,50** | 235 | 154 | 1 | 12044 | **36,11** | | |
| | **16,75** | 235 | 154 | 1 | 12047 | **51,98** | 21324 | **59,12** |
| | **17,00** | 235 | 154 | 1 | 12050 | **36,28** | 21326 | **43,86** |
| | **17,25** | 241 | 158 | 1 | 12053 | **59,76** | | |
| | **17,50** | 241 | 158 | 1 | 12056 | **53,63** | | |
| | **17,75** | 241 | 158 | 1 | 12059 | **69,69** | | |
| | **18,00** | 241 | 158 | 1 | 12062 | **37,83** | | |
| | **18,25** | 247 | 162 | 1 | 12065 | **82,09** | | |
| | **18,50** | 247 | 162 | 1 | 12068 | **58,59** | | |
| New! | **18,75** | 247 | 162 | 1 | 12071 | **81,39** | | |
| | **19,00** | 247 | 162 | 1 | 12074 | **47,41** | | |
| New! | **19,25** | 254 | 166 | 1 | 12077 | **86,17** | | |
| | **19,50** | 254 | 166 | 1 | 12080 | **91,21** | | |
| | **19,75** | 254 | 166 | 1 | 12083 | **103,00** | | |
| | **20,00** | 254 | 166 | 1 | 12086 | **53,21** | | |

# Ref. 9040

## BROCA MANGO CILÍNDRICO MATERIALES DUROS. SERIE EXTRA LARGA
Hard Materials Straight Shank Drill Bit. Extra Long Series
Foret queue cylindrique matériaux durs. Série extra-longue

HSSE 5%Co | DIN 1869 | 135° | Filo Corregido Convex Edge "U" Filets Corrigés | Perfil Profile Profil "S" | Rectificado Ground Taillé meulé | Tol. D h8




| Material Grupo | Sub. | Vc (m/min) 5% Co | Avances f/rev. (mm/rev) - Feed - Pas Ø 2 | Ø 3 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | P.2 | 20-25 | 0,035 | 0,045 | 0,050 | 0,080 | 0,100 | 0,120 | 0,130 | 0,160 | 0,160 |
| | P.5 | 8-12 | 0,025 | 0,040 | 0,050 | 0,060 | 0,080 | 0,100 | 0,100 | 0,120 | 0,160 |
| M | | 6-10 | 0,025 | 0,040 | 0,050 | 0,060 | 0,080 | 0,100 | 0,100 | 0,120 | 0,160 |
| K | K.1 | 30-35 | 0,060 | 0,090 | 0,100 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,300 |
| | K.2 | 25-30 | 0,050 | 0,070 | 0,080 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,240 |
| N | N.5 | 40-50 | 0,060 | 0,090 | 0,100 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,300 |
| | N.6 | 35-45 | 0,080 | 0,130 | 0,150 | 0,190 | 0,250 | 0,290 | 0,310 | 0,360 | 0,360 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

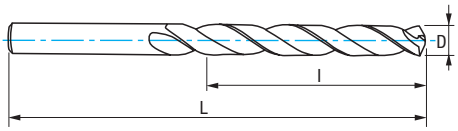
**Vf (mm/min.) = r.p.m. x f**

* Se recomienda reducir el avance entre 2/3 y 1/2, según profundidades
* It is recommended to reduce feed between 2/3 & 1/2, depending on deepness
* On conseille réduire l´avance entre 2/3 et 1/2, suivant les profondeurs

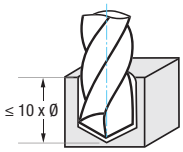
| D mm | L mm | l mm | | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| 2,00 | 125 | 85 | 1 | 72029 | 15,10 |
| 2,25 | 135 | 90 | 1 | 73925 | 19,23 |
| 2,50 | 140 | 95 | 1 | 72032 | 15,10 |
| 2,75 | 150 | 100 | 1 | 72035 | 21,08 |
| 3,00 | 150 | 100 | 1 | 75120 | 17,17 |
| 3,00 | 190 | 130 | 1 | 72038 | 21,16 |
| 3,25 | 155 | 105 | 1 | 73928 | 21,08 |
| 3,25 | 200 | 135 | 1 | 73931 | 26,03 |
| 3,50 | 165 | 115 | 1 | 72041 | 17,41 |
| 3,50 | 210 | 145 | 1 | 73934 | 22,35 |
| 3,50 | 265 | 180 | 1 | 73937 | 30,32 |
| 3,75 | 165 | 115 | 1 | 73940 | 24,40 |
| 3,75 | 210 | 145 | 1 | 72044 | 26,03 |
| 3,75 | 265 | 180 | 1 | 73943 | 34,38 |
| 4,00 | 175 | 120 | 1 | 72047 | 17,41 |
| 4,00 | 220 | 150 | 1 | 72053 | 22,35 |
| 4,00 | 280 | 190 | 1 | 72056 | 30,32 |
| 4,25 | 175 | 120 | 1 | 72059 | 25,87 |
| 4,25 | 220 | 150 | 1 | 72062 | 33,45 |
| 4,25 | 280 | 190 | 1 | 73946 | 41,84 |
| 4,50 | 185 | 125 | 1 | 72065 | 20,33 |
| 4,50 | 235 | 160 | 1 | 72068 | 26,55 |
| 4,50 | 295 | 220 | 1 | 73949 | 37,72 |
| 4,75 | 185 | 125 | 1 | 73952 | 26,64 |
| 4,75 | 235 | 160 | 1 | 72071 | 33,45 |
| 4,75 | 295 | 200 | 1 | 73955 | 41,84 |
| 5,00 | 195 | 135 | 1 | 72074 | 27,35 |
| 5,00 | 245 | 170 | 1 | 73958 | 30,93 |
| 5,00 | 315 | 210 | 1 | 73961 | 35,67 |
| 5,20 | 195 | 135 | 1 | 69428 | 27,00 |
| 5,25 | 195 | 135 | 1 | 72077 | 27,00 |
| 5,25 | 245 | 170 | 1 | 73964 | 37,35 |
| 5,25 | 315 | 210 | 1 | 72083 | 44,76 |
| 5,50 | 205 | 140 | 1 | 72086 | 21,84 |
| 5,50 | 260 | 180 | 1 | 72089 | 32,98 |
| 5,50 | 330 | 225 | 1 | 73967 | 40,55 |
| 5,75 | 205 | 140 | 1 | 77251 | 27,00 |
| 5,75 | 260 | 180 | 1 | 73970 | 37,35 |
| 5,75 | 330 | 225 | 1 | 72092 | 45,27 |
| 6,00 | 205 | 140 | 1 | 75225 | 21,81 |
| 6,00 | 260 | 180 | 1 | 72095 | 32,98 |
| 6,00 | 330 | 225 | 1 | 72098 | 40,70 |
| 6,25 | 215 | 150 | 1 | 73973 | 31,68 |
| 6,25 | 275 | 190 | 1 | 73976 | 39,07 |
| 6,25 | 350 | 235 | 1 | 73979 | 50,43 |
| 6,50 | 215 | 150 | 1 | 72101 | 27,00 |
| 6,50 | 275 | 190 | 1 | 72104 | 36,41 |
| 6,50 | 350 | 235 | 1 | 72107 | 46,47 |
| 6,75 | 225 | 155 | 1 | 72110 | 34,38 |
| 6,75 | 290 | 200 | 1 | 73982 | 45,10 |
| 6,75 | 370 | 250 | 1 | 73985 | 63,94 |
| 7,00 | 225 | 155 | 1 | 72113 | 33,51 |
| 7,00 | 290 | 200 | 1 | 72116 | 40,70 |
| 7,00 | 370 | 250 | 1 | 73988 | 59,90 |
| 7,25 | 225 | 155 | 1 | 73991 | 43,81 |
| 7,25 | 290 | 200 | 1 | 73994 | 54,00 |
| 7,25 | 370 | 250 | 1 | 73997 | 72,12 |
| 7,50 | 225 | 155 | 1 | 72119 | 36,99 |
| 7,50 | 290 | 200 | 1 | 74000 | 48,44 |
| 7,50 | 370 | 250 | 1 | 72122 | 68,03 |
| 7,75 | 240 | 165 | 1 | 72125 | 45,10 |
| 7,75 | 305 | 210 | 1 | 74003 | 54,00 |
| 7,75 | 390 | 265 | 1 | 74006 | 79,75 |
| 8,00 | 240 | 165 | 1 | 72128 | 37,72 |
| 8,00 | 305 | 210 | 1 | 74009 | 47,18 |
| 8,00 | 390 | 265 | 1 | 72131 | 69,89 |
| 8,25 | 240 | 165 | 1 | 72134 | 59,19 |
| 8,25 | 305 | 210 | 1 | 74012 | 78,57 |
| 8,25 | 390 | 265 | 1 | 72137 | 95,40 |
| 8,50 | 240 | 165 | 1 | 72140 | 51,18 |
| 8,50 | 305 | 210 | 1 | 74015 | 71,40 |
| 8,50 | 390 | 265 | 1 | 74018 | 87,42 |
| 8,75 | 240 | 165 | 1 | 74021 | 63,26 |
| 8,75 | 320 | 220 | 1 | 74024 | 78,57 |
| 8,75 | 410 | 280 | 1 | 74027 | 100,45 |
| 9,00 | 250 | 175 | 1 | 72143 | 54,60 |
| 9,00 | 320 | 220 | 1 | 72146 | 68,64 |
| 9,00 | 410 | 280 | 1 | 72149 | 92,81 |
| 9,25 | 250 | 175 | 1 | 74030 | 73,97 |
| 9,25 | 320 | 220 | 1 | 74033 | 94,27 |
| 9,25 | 410 | 280 | 1 | 74036 | 117,91 |
| 9,50 | 250 | 175 | 1 | 74039 | 63,26 |
| 9,50 | 320 | 220 | 1 | 74042 | 82,09 |
| 9,50 | 410 | 280 | 1 | 74045 | 109,11 |
| 9,75 | 265 | 185 | 1 | 74048 | 75,48 |
| 9,75 | 340 | 235 | 1 | 72152 | 98,26 |
| 9,75 | 430 | 295 | 1 | 74051 | 126,65 |
| 10,00 | 265 | 185 | 1 | 72155 | 57,33 |
| 10,00 | 340 | 235 | 1 | 74054 | 75,48 |
| 10,00 | 430 | 295 | 1 | 72158 | 106,38 |
| 10,50 | 265 | 185 | 1 | 72161 | 96,92 |
| 10,50 | 340 | 235 | 1 | 74057 | 105,00 |
| 10,50 | 430 | 295 | 1 | 74060 | 111,69 |
| 11,00 | 280 | 195 | 1 | 74063 | 72,64 |
| 11,00 | 365 | 250 | 1 | 75166 | 94,27 |
| 11,00 | 455 | 310 | 1 | 74066 | 110,35 |
| 11,50 | 280 | 195 | 1 | 74069 | 90,22 |
| 11,50 | 365 | 250 | 1 | 74072 | 121,12 |
| 11,50 | 455 | 310 | 1 | 72164 | 125,16 |
| 12,00 | 295 | 205 | 1 | 72167 | 82,09 |
| 12,00 | 375 | 260 | 1 | 74075 | 106,38 |
| 12,00 | 480 | 330 | 1 | 74078 | 129,43 |
| 12,50 | 295 | 205 | 1 | 72170 | 105,00 |
| 12,50 | 375 | 260 | 1 | 72173 | 117,57 |
| 12,50 | 480 | 330 | 1 | 74081 | 142,74 |
| 13,00 | 295 | 205 | 1 | 72176 | 105,00 |
| 13,00 | 375 | 260 | 1 | 74084 | 121,12 |
| 13,00 | 480 | 330 | 1 | 72179 | 144,10 |

# Ref. 1040

## BROCA MANGO CILÍNDRICO HSS. SERIE EXTRA LARGA
HSS Straight Shank Drill Bit. Extra Long Series
Foret queue cylindrique HSS. Série extra-longue




| HSS | DIN 1869 N | 118° | | | Blue Finish | **Rectificado Ground** Taillé meulé | Tol. D h8 |
|---|---|---|---|---|---|---|---|




| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | HSS |
| P | P.1 | 25-30 |
| K | K.1 | 30-35 |
| | K.2 | 25-30 |
| N | N.3 | 60-80 |
| | N.4 | |
| | N.5 | 40-50 |

**r.p.m.** = $\frac{\text{Vc x 1.000}}{\pi \times \text{Ø}}$

**Vf (mm/min.) = r.p.m. x f**

| Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| 0,045 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 | 0,180 | 0,250 |
| 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 |
| 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,280 |
| 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 | 0,450 |
| 0,080 | 0,110 | 0,130 | 0,150 | 0,190 | 0,220 | 0,260 | 0,320 | 0,380 | 0,450 |
| 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 |

*** Se recomienda reducir el avance entre 2/3 y 1/2**
*** It is recommended to reduce feed between 2/3 & 1/2**
* On conseille réduire l´avance entre 2/3 et 1/2

| D mm | L mm | l mm | | N° Art. HSS | € |
|---|---|---|---|---|---|
| **2,00** | 125 | 85 | 1 | 12158 | **11,09** |
| **2,50** | 140 | 95 | 1 | 12161 | **11,59** |
| **3,00** | 150 | 100 | 1 | 12164 | **12,01** |
| **3,00** | 190 | 136 | 1 | 12167 | **13,87** |
| **3,50** | 165 | 115 | 1 | 12170 | **13,54** |
| **3,50** | 210 | 145 | 1 | 12173 | **15,61** |
| **3,50** | 265 | 180 | 1 | 12176 | **22,34** |
| **4,00** | 175 | 120 | 1 | 12179 | **13,54** |
| **4,00** | 220 | 150 | 1 | 12182 | **15,95** |
| **4,00** | 280 | 190 | 1 | 12185 | **22,76** |
| **4,50** | 185 | 125 | 1 | 12188 | **15,02** |
| **4,50** | 235 | 160 | 1 | 12191 | **18,74** |
| **4,50** | 295 | 200 | 1 | 12194 | **26,82** |
| **5,00** | 195 | 135 | 1 | 12197 | **15,85** |
| **5,00** | 245 | 170 | 1 | 12200 | **20,16** |
| **5,00** | 315 | 210 | 1 | 12203 | **24,77** |
| **5,50** | 205 | 140 | 1 | 12206 | **18,77** |
| **5,50** | 260 | 180 | 1 | 12209 | **26,82** |
| **5,50** | 330 | 225 | 1 | 12212 | **30,95** |
| **6,00** | 205 | 140 | 1 | 12215 | **18,77** |
| **6,00** | 260 | 180 | 1 | 12218 | **26,82** |
| **6,00** | 330 | 225 | 1 | 12221 | **30,95** |
| **6,50** | 215 | 150 | 1 | 12224 | **22,34** |
| **6,50** | 275 | 190 | 1 | 12227 | **28,83** |

| D mm | L mm | l mm | | N° Art. HSS | € |
|---|---|---|---|---|---|
| **6,50** | 350 | 235 | 1 | 12230 | **35,92** |
| **7,00** | 225 | 155 | 1 | 12233 | **23,65** |
| **7,00** | 290 | 200 | 1 | 12236 | **32,94** |
| **7,00** | 370 | 250 | 1 | 12239 | **44,53** |
| **7,50** | 225 | 155 | 1 | 12242 | **26,64** |
| **7,50** | 290 | 200 | 1 | 12245 | **35,48** |
| **7,50** | 370 | 250 | 1 | 12248 | **51,70** |
| **8,00** | 240 | 165 | 1 | 12251 | **29,43** |
| **8,00** | 305 | 210 | 1 | 12254 | **40,77** |
| **8,00** | 390 | 265 | 1 | 12257 | **53,12** |
| **8,50** | 240 | 165 | 1 | 12260 | **40,06** |
| **8,50** | 305 | 210 | 1 | 12263 | **54,58** |
| **8,50** | 390 | 265 | 1 | 12266 | **75,07** |
| **9,00** | 250 | 175 | 1 | 12269 | **38,18** |
| **9,00** | 320 | 220 | 1 | 12272 | **50,43** |
| **9,00** | 410 | 280 | 1 | 12275 | **74,05** |
| **9,50** | 250 | 175 | 1 | 12278 | **44,99** |
| **9,50** | 320 | 220 | 1 | 12281 | **61,83** |
| **9,50** | 410 | 280 | 1 | 12284 | **83,30** |
| **10,00** | 265 | 185 | 1 | 12287 | **44,39** |
| **10,00** | 340 | 235 | 1 | 12290 | **58,08** |
| **10,00** | 430 | 295 | 1 | 12293 | **80,69** |
| **11,00** | 280 | 195 | 1 | 28866 | **56,21** |
| **12,00** | 295 | 205 | 1 | 28867 | **74,21** |

IZAR CUTTING TOOLS

new packaging !

# OLATU

## Marcamos la diferencia

- **Diseño exclusivo**
- **13% más ligero**
- **64% menos de impacto ambiental**
- **Ergonómico**
- **Apto para colgar**
- **Apilable**

## Making the difference

- Exclusive design
- 13% lighter
- 64% less environmental impact
- Ergonomic
- Possible to hang
- Stackable

## Marquant la différence

- Design esclusif
- 13% plus léger
- 64% moins d'impact environnementale
- Ergonomique
- Brochable
- Empilable

**Video**

# Sets 1466

**JUEGO BROCAS. 19 PCS. (1-10 X 0,50 mm)**
Drill Bit Set. 19 pcs. (1-10 × 0,50 mm)
Jeu de forets. 19 pcs. (1-10 × 0,50 mm)

Ref. 1021

| N° Art. 5% Co | € |
|---|---|
| 34201 | **101,50** |

Ref. 1020

| N° Art. 5% Co | € |
|---|---|
| 24636 | **81,79** |

Ref. 1029

| N° Art. BORDEAUX | € |
|---|---|
| 81649 | **92,34** |

Ref. 1016

| N° Art. 5% Co | € |
|---|---|
| 25274 | **59,72** |

Ref. 1016 TIALSIN

| N° Art. TIALSIN | € |
|---|---|
| 14748 | **122,25** |

New!

Ref. 1032

| N° Art. 5% Co | € |
|---|---|
| 80139 | **81,45** |

Ref. 1015

| N° Art. Zirkonio | € |
|---|---|
| 59234 | **61,48** |

Ref. 1013

| N° Art. HSS | € |
|---|---|
| 18808 | **39,12** |

Ref. 1013 TIALSIN

| N° Art. TIALSIN | € |
|---|---|
| 38833 | **102,26** |

Ref. 1010

| N° Art. HSS | € |
|---|---|
| 25271 | **35,17** |

Ref. 1010 TIN

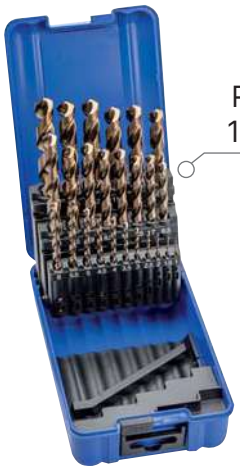
| N° Art. TIN | € |
|---|---|
| 27132 | **75,42** |

Ref. 1025

| N° Art. HSS | € |
|---|---|
| 66659 | **126,34** |

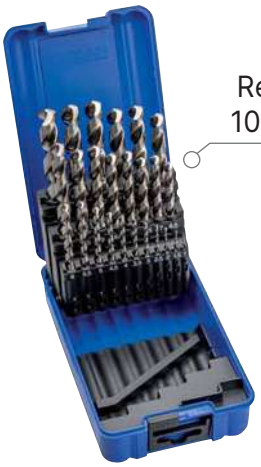
# Sets 1456

**JUEGO BROCAS. 25 PCS. (1-13 X 0,50 mm)**
Drill Bit Set. 25 pcs. (1-13 × 0,50 mm)
Jeu de forets. 25 pcs. (1-13 × 0,50 mm)



Ref. 1021

| N° Art. 5% Co | € |
|---|---|
| 34199 | **222,26** |

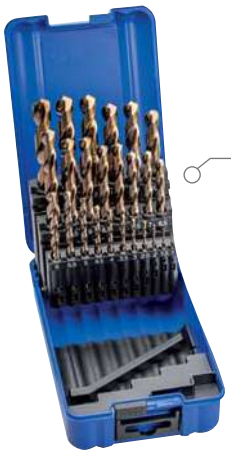


Ref. 1020

| N° Art. 5% Co | € |
|---|---|
| 24638 | **178,72** |

Ref. 1029

| N° Art. BORDEAUX | € |
|---|---|
| 81687 | **208,96** |



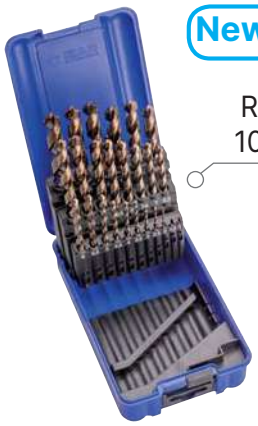
Ref. 1016

| N° Art. 5% Co | € |
|---|---|
| 18370 | **139,02** |

Ref. 1016 TIALSIN

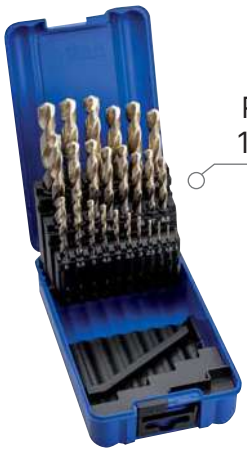
| N° Art. TIALSIN | € |
|---|---|
| 15378 | **277,46** |

New!



Ref. 1032

| N° Art. 5% Co | € |
|---|---|
| 34348 | **171,38** |



Ref. 1015

| N° Art. Zirkonio | € |
|---|---|
| 59235 | **142,36** |

Ref. 1013

| N° Art. HSS | € |
|---|---|
| 18807 | **82,95** |

Ref. 1013 TIALSIN

| N° Art. TIALSIN | € |
|---|---|
| 38832 | **222,00** |

Ref. 1010

| N° Art. HSS | € |
|---|---|
| 25235 | **74,40** |

Ref. 1010 TIN

| N° Art. TIN | € |
|---|---|
| 27133 | **164,52** |

# Sets 1459

**JUEGO BROCAS. 29 PCS (1-13 × 0.50 mm + Previos roscado*)**
Drill Bit Set. 29 pcs (1-13 × 0.50 mm + Before Threading sizes*)
Jeu de forets. 29 pcs (1-13 × 0.50 mm + Pré Taraudage*)

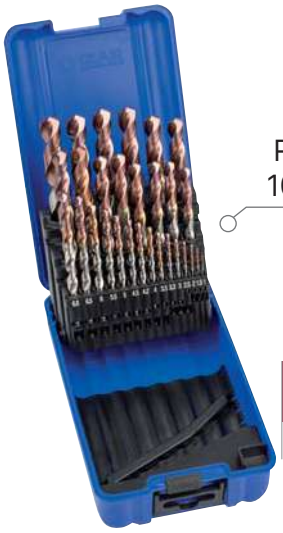
New!

Ref. 1021

| N° Art. 5% Co | € |
|---|---|
| 15114 | 250,25 |

Ref. 1020

| N° Art. 5% Co | € |
|---|---|
| 15113 | 201,14 |



Ref. 1029

| N° Art. BORDEAUX | € |
|---|---|
| 15111 | 237,11 |

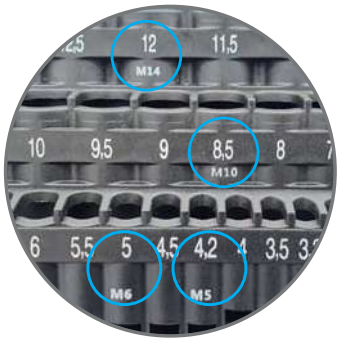
Ref. 1016

| N° Art. 5% Co | € |
|---|---|
| 15073 | 155,69 |

| N° Art. TIALSIN | € |
|---|---|
| 15090 | 314,92 |

* **Previos Roscado**
**Before Threading**
Pré-Taraudage
**(3,3 – 4,2 – 6,8 – 10,2 mm)**

| | |
|---|---|
| **M3** | 2,50 mm |
| **M4** | 3,30 mm |
| **M5** | 4,20 mm |
| **M6** | 5,00 mm |
| **M8** | 6,80 mm |
| **M10** | 8,50 mm |
| **M12** | 10,20 mm |
| **M14** | 12,00 mm |




**Estuche indicando los previos al roscado**
**Information about threading sizes on the set**
Informations concernant les mesures de pré-taraudage dans le coffret

New!

Ref. 1032

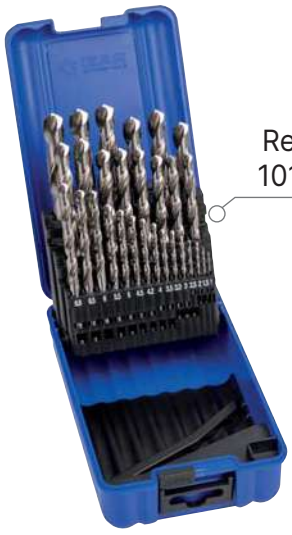
| N° Art. 5% Co | € |
|---|---|
| 84159 | 192,19 |

Ref. 1015

| N° Art. Zirkonio | € |
|---|---|
| 15115 | 159,43 |

Ref. 1010

| N° Art. HSS | € | N° Art. TIN | € |
|---|---|---|---|
| 15070 | 83,15 | 15089 | 187,07 |



Ref. 1013

| N° Art. HSS | € | N° Art. TIALSIN | € |
|---|---|---|---|
| 15088 | 92,76 | 15120 | 252,38 |

## Sets 1407

**JUEGO BROCAS. 37 PCS. (1-10 X 0,25 mm)**
Drill Bit Set. 37 pcs. (1-10 × 0,25 mm)
Jeu de forets. 37 pcs. (1-10 × 0,25 mm)

Ref. 1016

| N° Art. 5% Co | € |
|---|---|
| 18367 | **155,27** |

Ref. 1010

| N° Art. HSS | € |
|---|---|
| 26768 | **99,93** |

Ref. 1010 TIN

| N° Art. TIN | € |
|---|---|
| 27134 | **179,66** |

## Sets 1409

**JUEGO BROCAS. 49 PCS. (1-13 X 0,25 mm)**
Drill Bit Set. 49 pcs. (1-13 × 0,25 mm)
Jeu de forets. 49 pcs. (1-13 × 0,25 mm)

Ref. 1016

| N° Art. 5% Co | € |
|---|---|
| 18369 | **330,36** |

Ref. 1010

| N° Art. HSS | € |
|---|---|
| 26802 | **182,01** |

Ref. 1010 TIN

| N° Art. TIN | € |
|---|---|
| 27135 | **361,63** |

## Sets 1405

**JUEGO BROCAS. 50 PCS. (1-5,9 X 0,10 mm)**
Drill Bit Set. 50 pcs. (1-5,9 × 0,10 mm)
Jeu de Forets. 50 pcs. (1-5,9 × 0,10 mm)

Ref. 1016

| N° Art. 5% Co | € |
|---|---|
| 10788 | **106,48** |

Ref. 1010

| N° Art. HSS | € |
|---|---|
| 26765 | **66,22** |

Ref. 1010 TIN

| N° Art. TIN | € |
|---|---|
| 13154 | **120,14** |

## Sets 1408

**JUEGO BROCAS. 41 PCS. (6-10 X 0,10 mm)**
Drill Bit Set. 41 pcs. (6-10 × 0,10 mm)
Jeu de forets. 41 pcs. (6-10 × 0,10 mm)

Ref. 1016

| N° Art. 5% Co | € |
|---|---|
| 18366 | **258,76** |

Ref. 1010 TIN

| N° Art. TIN | € |
|---|---|
| 13152 | **306,97** |

Ref. 1010

| N° Art. HSS | € |
|---|---|
| 26771 | **171,28** |

# Sets 1406

**JUEGO BROCAS. 91 PCS. (1-10 X 0,10 mm)**
Drill Bit Set. 91 pcs. (1-10 × 0,10 mm)
Jeu de forets. 91 pcs. (1-10 × 0,10 mm)

Ref. 1016

| N° Art. 5% Co | € |
|---|---|
| 56686 | **354,78** |

Ref. 1015

| N° Art. Zirkonio | € |
|---|---|
| 66483 | **364,10** |

Ref. 1013

| N° Art. HSS | € |
|---|---|
| 60624 | **255,64** |

Ref. 1010

| N° Art. HSS | € |
|---|---|
| 56685 | **230,98** |

# Sets 1404

**JUEGO BROCAS. 99 PCS (1-10 × 0.10 mm + Previos roscado < 13 mm)**
Drill Bit Set. 99 pcs (1-10 × 0.10 mm + Before Threading sizes < 13 mm)
Jeu de forets. 99 pcs (1-10 × 0.10 mm + Pré Taraudage < 13 mm)

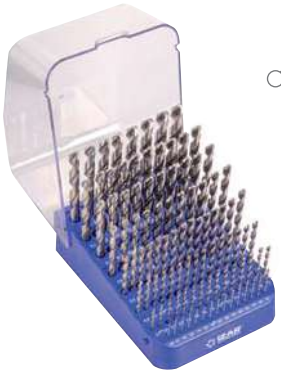
**New!**

Ref. 1016

| N° Art. 5% Co | € |
|---|---|
| 48821 | **449,71** |

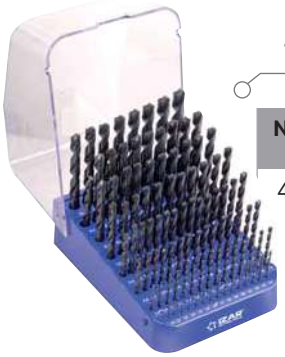
Ref. 1015

| N° Art. Zirkonio | € |
|---|---|
| 48824 | **461,40** |



Ref. 1013

| N° Art. HSS | € |
|---|---|
| 48818 | **303,37** |



Ref. 1010

| N° Art. HSS | € |
|---|---|
| 48815 | **271,80** |

New!

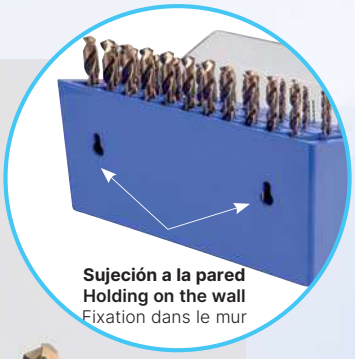
# NOVABOX

Sets 1410

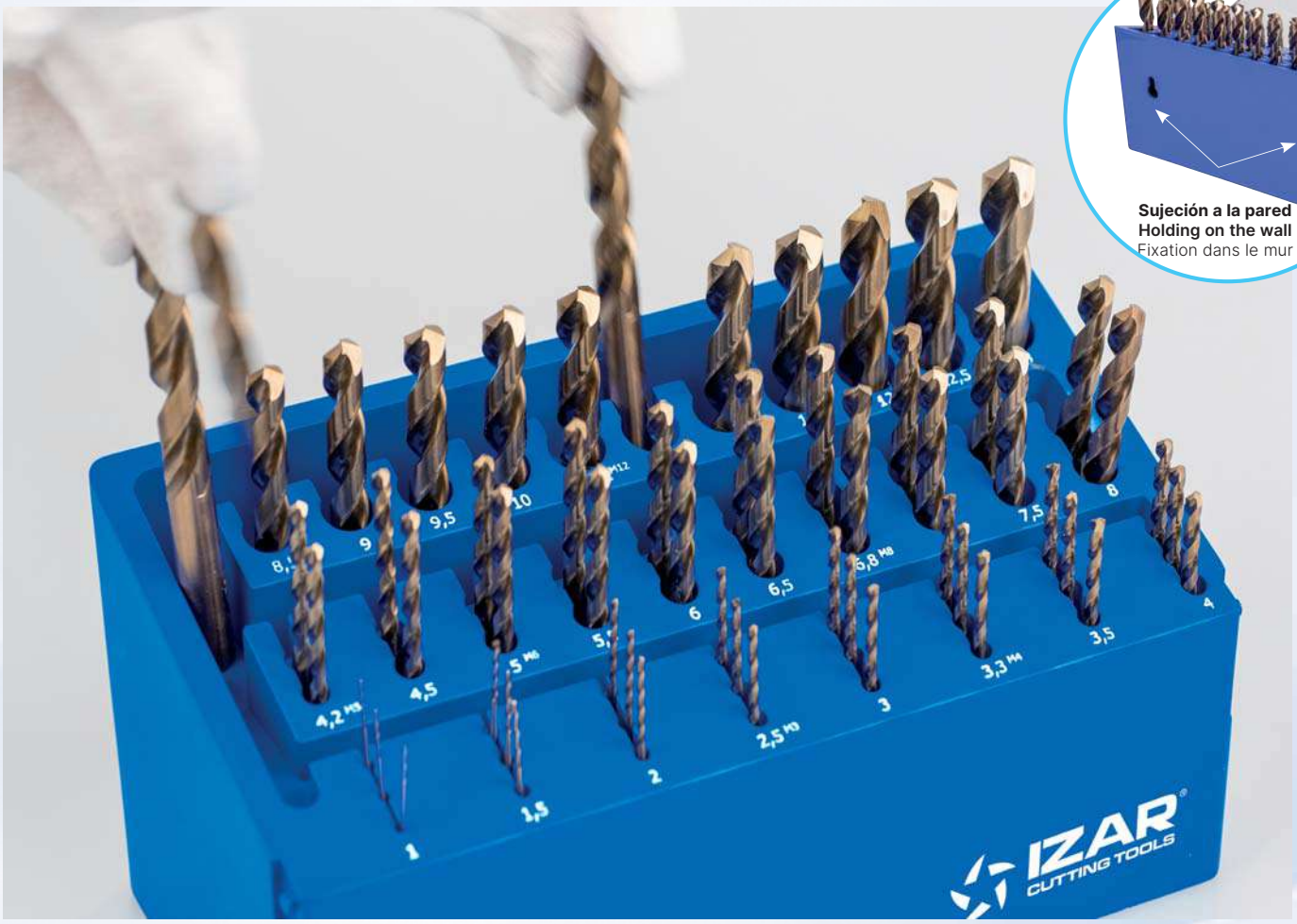
## Medir y ubicar las brocas en un solo movimiento

Gauge and place the drills in one single movement

Measurer et classer les forets en une seule course



**Sujeción a la pared**
**Holding on the wall**
Fixation dans le mur




- **Almacena y trabaja con este juego de 55 brocas para metal**
- **Manejo fácil para colocar las brocas en los huecos correspondientes**
- **Posibilidad de colgar en la pared gracias al colgador trasero**

- **Storage and management in a 55 metalworking drill set**
- **Easy use to put drills in suitable socket**
- **Possibility to hang on the wall**

- Stockez et travaillez avec ce jeu de 55 forets
- Utilisation facile pour ranger les forets dans le trou correspondant
- Possibilité d'accrocher au mur grâce au crochet arrière

**Contenido:**
**Content:**
Contenu:

**55** pcs

- **Ø1,0 – 4,0 mm:** **3 piezas pieces** pièces
- **Ø4,2 – 8,0 mm:** **2 piezas pieces** pièces
- **Ø8,50 – 13,0 mm:** **1 pieza pieces** pièces

**Agujeros para:**
- **Brocas desde 1 a 13 mm x 0,5 mm**
- **Incluye los siguientes diámetros previos al roscado:**
  **ø2,5 / 3,3 / 4,2 / 5,0 / 6,8 / 8,5 / 10,2 / 12,0 mm para las métricas de roscado**
  **M3 / M4 / M5 / M6 / M8 / M10 / M12 / M14**

**Holes for:**
- **Drill diameters from 1 to 13 mm x 0,5 mm**
- **Includes core hole sizes:**
  **ø2,5 / 3,3 / 4,2 / 5,0 / 6,8 / 8,5 / 10,2 / 12,0 mm for threading dimensions**
  **M3 / M4 / M5 / M6 / M8 / M10 / M12 / M14**

Trous pour:
- Forets de 1 á 13 mm x 0,5 mm
- Inclut les diametres suivantes pré-taraudage:
  ø2,5 / 3,3 / 4,2 / 5,0 / 6,8 / 8,5 / 10,2 / 12,0 mm pour les metriques de taraudage
  M3 / M4 / M5 / M6 / M8 / M10 / M12 / M14

# Sets 1410

## MEDIDOR DE DIÁMETROS
Diameter gauge
Jauge de diamètres

**55 Pcs:**

**1-13 × 0,5 mm**

- **Ø1,0 – 4,0 mm: 3 pcs**
- **Ø4,2 – 8,0 mm: 2 pcs**
- **Ø8,50 – 13,0 mm: 1 pcs**

Ref. 1016

| Cont. Ø | N° Art. 5% Co | € |
|---|---|---|
| 1 - 13 × 0,5 mm | 19537 | 235,30 |

Ref. 1015

| Cont. Ø | N° Art. Zirkonio | € |
|---|---|---|
| 1 - 13 × 0,5 mm | 28360 | 241,82 |

Ref. 1010

| Cont. Ø | N° Art. HSS | € |
|---|---|---|
| 1 - 13 × 0,5 mm | 19535 | 136,45 |

Ref. 1013

| Cont. Ø | N° Art. HSS | € |
|---|---|---|
| 1 - 13 × 0,5 mm | 19536 | 148,37 |

# Sets 1470

**JUEGO BROCAS**
Drill Bit Set
Jeu de forets

**170 Pcs: 1-10 × 0,5 mm**
ø 1-8: 10 pcs/ø
ø 8,5-10: 5 pcs/ø

Ref. 1016

| N° Art. 5% Co | € |
|---|---|
| 10676 | **470,39** |

Ref. 1013

| N° Art. HSS | € |
|---|---|
| 56677 | **304,09** |

Ref. 1010

| N° Art. HSS | € |
|---|---|
| 19590 | **272,69** |

**220 Pcs: 1-13 × 0,5 + 3,3 + 4,2 mm**
ø 1-8: 10 pcs/ø
ø 8,5-13: 5 pcs/ø

Ref. 1016

| N° Art. 5% Co | € |
|---|---|
| 25391 | **930,73** |

Ref. 1013

| N° Art. HSS | € |
|---|---|
| 56679 | **572,68** |

Ref. 1010

| N° Art. HSS | € |
|---|---|
| 56676 | **516,18** |

# Sets 1476

**JUEGO BROCAS. 19 PCS. (1-10 X 0,50 mm)**
Drill Bit Set. 19 pcs. (1-10 × 0,50 mm)
Jeu de forets. 19 pcs. (1-10 × 0,50 mm)

Ref. 1056

| N° Art. 5% Co | € |
|---|---|
| 11943 | **95,13** |

Ref. 1056 TIALSIN

| N° Art. TIALSIN | € |
|---|---|
| 27014 | **140,72** |

Ref. 1050

| N° Art. HSS | € |
|---|---|
| 11935 | **62,95** |

# New Exhibitors!

## Set 1029 New!

**BROCA MULTI ACERO**
Multi-Steel Drill Bit
Foret multi-acier

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 5,50 | 10 | 10,00 | 10 |
| 1,50 | 10 | 6,00 | 10 | 10,50 | 5 |
| 2,00 | 10 | 6,50 | 10 | 11,00 | 5 |
| 2,50 | 10 | 7,00 | 10 | 11,50 | 5 |
| 3,00 | 10 | 7,50 | 10 | 12,00 | 5 |
| 3,50 | 10 | 8,00 | 10 | 12,50 | 5 |
| 4,00 | 10 | 8,50 | 10 | 13,00 | 5 |
| 4,50 | 10 | 9,00 | 10 | | |
| 5,00 | 10 | 9,50 | 10 | | |

220 Pcs

| N° Art. BORDEAUX | € |
|---|---|
| 41037 | 1.479,15 |

## Set 1032 New!

**BROCA COBALTO METALMAX**
METALMAX Cobalt Drill Bit
Foret cobalt METALMAX

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 5,50 | 10 | 10,00 | 10 |
| 1,50 | 10 | 6,00 | 10 | 10,50 | 5 |
| 2,00 | 10 | 6,50 | 10 | 11,00 | 5 |
| 2,50 | 10 | 7,00 | 10 | 11,50 | 5 |
| 3,00 | 10 | 7,50 | 10 | 12,00 | 5 |
| 3,50 | 10 | 8,00 | 10 | 12,50 | 5 |
| 4,00 | 10 | 8,50 | 10 | 13,00 | 5 |
| 4,50 | 10 | 9,00 | 10 | | |
| 5,00 | 10 | 9,50 | 10 | | |

220 Pcs

| N° Art. HSSE | € |
|---|---|
| 41034 | 1.236,80 |

## Sets 1021

**BROCA MULTI INOX**

Multi-STAINLESS Drill Bit

Foret Multi INOX

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 5,50 | 10 | 10,00 | 5 |
| 1,50 | 10 | 6,00 | 10 | 10,50 | 1 |
| 2,00 | 10 | 6,50 | 10 | 11,00 | 1 |
| 2,50 | 10 | 7,00 | 10 | 11,50 | 1 |
| 3,00 | 10 | 7,50 | 10 | 12,00 | 1 |
| 3,50 | 10 | 8,00 | 10 | 12,50 | 1 |
| 4,00 | 10 | 8,50 | 5 | 13,00 | 1 |
| 4,50 | 10 | 9,00 | 5 | | |
| 5,00 | 10 | 9,50 | 5 | | |

176 Pcs

| N° Art. HSSE | € |
|---|---|
| 55448 | 913,21 |

**Cuartos** / **Quarters** / Quarts

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 4,25 | 10 | 8,00 | 10 |
| 1,50 | 10 | 4,50 | 10 | 8,50 | 10 |
| 2,00 | 10 | 5,00 | 10 | 9,00 | 10 |
| 2,50 | 10 | 5,50 | 10 | 9,50 | 5 |
| 3,00 | 10 | 6,00 | 10 | 10,00 | 5 |
| 3,25 | 10 | 6,50 | 10 | 11,00 | 2 |
| 3,50 | 10 | 7,00 | 10 | 12,00 | 2 |
| 4,00 | 10 | 7,50 | 10 | 13,00 | 2 |

206 Pcs

| N° Art. HSSE | € |
|---|---|
| 57527 | 1.066,46 |

**Previos Roscado** / **Before Threading** / Pré-Taraudage

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 4,50 | 10 | 8,50 | 10 |
| 1,50 | 10 | 5,00 | 10 | 9,00 | 10 |
| 2,00 | 10 | 5,50 | 10 | 9,50 | 5 |
| 2,50 | 10 | 6,00 | 10 | 10,00 | 5 |
| 3,00 | 10 | 6,50 | 10 | 10,20 | 2 |
| 3,30 | 10 | 6,80 | 10 | 11,00 | 2 |
| 3,50 | 10 | 7,00 | 10 | 12,00 | 2 |
| 4,00 | 10 | 7,50 | 10 | 13,00 | 2 |
| 4,20 | 10 | 8,00 | 10 | | |

218 Pcs

| N° Art. HSSE | € |
|---|---|
| 57981 | 1.162,18 |

## Sets 1020

**BROCA INOX**

Stainless Steel Drill Bit

Foret Inoxydable

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 5,50 | 10 | 10,00 | 5 |
| 1,50 | 10 | 6,00 | 10 | 10,50 | 5 |
| 2,00 | 10 | 6,50 | 10 | 11,00 | 5 |
| 2,50 | 10 | 7,00 | 10 | 11,50 | 5 |
| 3,00 | 10 | 7,50 | 10 | 12,00 | 5 |
| 3,50 | 10 | 8,00 | 10 | 12,50 | 5 |
| 4,00 | 10 | 8,50 | 5 | 13,00 | 5 |
| 4,50 | 10 | 9,00 | 5 | | |
| 5,00 | 10 | 9,50 | 5 | | |

200 Pcs

| N° Art. HSSE | € |
|---|---|
| 55446 | 1.116,40 |

**Cuartos** / **Quarters** / Quarts

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 4,25 | 10 | 8,00 | 10 |
| 1,50 | 10 | 4,50 | 10 | 8,50 | 5 |
| 2,00 | 20 | 5,00 | 20 | 9,00 | 10 |
| 2,50 | 10 | 5,50 | 10 | 9,50 | 5 |
| 3,00 | 20 | 6,00 | 20 | 10,00 | 5 |
| 3,25 | 10 | 6,50 | 10 | 11,00 | 5 |
| 3,50 | 20 | 7,00 | 10 | 12,00 | 5 |
| 4,00 | 20 | 7,50 | 10 | 13,00 | 5 |

270 Pcs

| N° Art. HSSE | € |
|---|---|
| 57526 | 1.121,40 |

**Previos Roscado** / **Before Threading** / Pré-Taraudage

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 4,50 | 10 | 8,50 | 5 |
| 1,50 | 10 | 5,00 | 20 | 9,00 | 10 |
| 2,00 | 20 | 5,50 | 10 | 9,50 | 5 |
| 2,50 | 10 | 6,00 | 20 | 10,00 | 5 |
| 3,00 | 20 | 6,50 | 10 | 10,20 | 5 |
| 3,30 | 10 | 6,80 | 10 | 11,00 | 5 |
| 3,50 | 20 | 7,00 | 10 | 12,00 | 5 |
| 4,00 | 20 | 7,50 | 10 | 13,00 | 5 |
| 4,20 | 10 | 8,00 | 10 | | |

285 Pcs

| N° Art. HSSE | € |
|---|---|
| 57979 | 1.235,10 |

## Sets 1016

**BROCA MATERIALES DUROS**

Hard Materials Drill Bit

Foret matériaux durs

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 5,50 | 10 | 10,00 | 10 |
| 1,50 | 10 | 6,00 | 10 | 10,50 | 5 |
| 2,00 | 10 | 6,50 | 10 | 11,00 | 5 |
| 2,50 | 10 | 7,00 | 10 | 11,50 | 5 |
| 3,00 | 10 | 7,50 | 10 | 12,00 | 5 |
| 3,50 | 10 | 8,00 | 10 | 12,50 | 5 |
| 4,00 | 10 | 8,50 | 10 | 13,00 | 5 |
| 4,50 | 10 | 9,00 | 10 | | |
| 5,00 | 10 | 9,50 | 10 | | |

220 Pcs

| N° Art. HSSE | € |
|---|---|
| 55449 | 966,35 |

**Cuartos** / **Quarters** / Quarts

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 4,25 | 10 | 8,00 | 30 |
| 1,50 | 10 | 4,50 | 10 | 8,50 | 10 |
| 2,00 | 40 | 5,00 | 40 | 9,00 | 10 |
| 2,50 | 10 | 5,50 | 10 | 9,50 | 10 |
| 3,00 | 40 | 6,00 | 40 | 10,00 | 10 |
| 3,25 | 10 | 6,50 | 10 | 11,00 | 5 |
| 3,50 | 10 | 7,00 | 10 | 12,00 | 5 |
| 4,00 | 40 | 7,50 | 10 | 13,00 | 5 |

395 Pcs

| N° Art. HSSE | € |
|---|---|
| 57525 | 1.171,25 |

**Previos Roscado** / **Before Threading** / Pré-Taraudage

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 4,50 | 10 | 8,50 | 10 |
| 1,50 | 10 | 5,00 | 40 | 9,00 | 10 |
| 2,00 | 40 | 5,50 | 10 | 9,50 | 10 |
| 2,50 | 10 | 6,00 | 40 | 10,00 | 10 |
| 3,00 | 40 | 6,50 | 10 | 10,20 | 5 |
| 3,30 | 10 | 6,80 | 10 | 11,00 | 5 |
| 3,50 | 10 | 7,00 | 10 | 12,00 | 5 |
| 4,00 | 40 | 7,50 | 10 | 13,00 | 5 |
| 4,20 | 10 | 8,00 | 30 | | |

410 Pcs

| N° Art. HSSE | € |
|---|---|
| 57978 | 1.256,20 |

# Sets 1015

**BROCA ZIRKONIO**
Zirkonio Drill Bit
Foret Zirkonio

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 5,50 | 10 | 10,00 | 5 |
| 1,50 | 10 | 6,00 | 10 | 10,50 | 5 |
| 2,00 | 10 | 6,50 | 10 | 11,00 | 5 |
| 2,50 | 10 | 7,00 | 10 | 11,50 | 5 |
| 3,00 | 10 | 7,50 | 10 | 12,00 | 5 |
| 3,50 | 10 | 8,00 | 10 | 12,50 | 5 |
| 4,00 | 10 | 8,50 | 5 | 13,00 | 5 |
| 4,50 | 10 | 9,00 | 5 | | |
| 5,00 | 10 | 9,50 | 5 | | |

200 Pcs

| N° Art. Zirkonio | € |
|---|---|
| 14229 | 873,70 |

**Cuartos** / **Quarters** / Quarts

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 4,25 | 10 | 8,00 | 20 |
| 1,50 | 10 | 4,50 | 10 | 8,50 | 10 |
| 2,00 | 30 | 5,00 | 40 | 9,00 | 10 |
| 2,50 | 10 | 5,50 | 10 | 9,50 | 5 |
| 3,00 | 50 | 6,00 | 50 | 10,00 | 10 |
| 3,25 | 10 | 6,50 | 10 | 11,00 | 5 |
| 3,50 | 10 | 7,00 | 10 | 12,00 | 5 |
| 4,00 | 50 | 7,50 | 10 | 13,00 | 5 |

400 Pcs

| N° Art. Zirkonio | € |
|---|---|
| 15999 | 1.175,80 |

**Previos Roscado** / **Before Threading** / Pré-Taraudage

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 4,50 | 10 | 8,50 | 10 |
| 1,50 | 10 | 5,00 | 40 | 9,00 | 10 |
| 2,00 | 30 | 5,50 | 10 | 9,50 | 5 |
| 2,50 | 10 | 6,00 | 50 | 10,00 | 10 |
| 3,00 | 50 | 6,50 | 10 | 10,20 | 5 |
| 3,30 | 10 | 6,80 | 10 | 11,00 | 5 |
| 3,50 | 10 | 7,00 | 10 | 12,00 | 5 |
| 4,00 | 50 | 7,50 | 10 | 13,00 | 5 |
| 4,20 | 10 | 8,00 | 20 | | |

415 Pcs

| N° Art. Zirkonio | € |
|---|---|
| 16001 | 1.262,25 |

# Sets 1013

**BROCA AGUZADA**
Split Point Drill Bit
Foret affutage en croix

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 5,50 | 10 | 10,00 | 5 |
| 1,50 | 10 | 6,00 | 30 | 10,50 | 5 |
| 2,00 | 20 | 6,50 | 10 | 11,00 | 5 |
| 2,50 | 20 | 7,00 | 10 | 11,50 | 5 |
| 3,00 | 40 | 7,50 | 10 | 12,00 | 5 |
| 3,50 | 20 | 8,00 | 20 | 12,50 | 5 |
| 4,00 | 40 | 8,50 | 5 | 13,00 | 5 |
| 4,50 | 20 | 9,00 | 5 | | |
| 5,00 | 30 | 9,50 | 5 | | |

350 Pcs

| N° Art. HSS | € |
|---|---|
| 55443 | 681,35 |

**Cuartos** / **Quarters** / Quarts

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 30 | 4,25 | 30 | 8,00 | 40 |
| 1,50 | 20 | 4,50 | 30 | 8,50 | 20 |
| 2,00 | 40 | 5,00 | 50 | 9,00 | 20 |
| 2,50 | 30 | 5,50 | 40 | 9,50 | 5 |
| 3,00 | 50 | 6,00 | 50 | 10,00 | 20 |
| 3,25 | 30 | 6,50 | 20 | 11,00 | 5 |
| 3,50 | 30 | 7,00 | 20 | 12,00 | 10 |
| 4,00 | 50 | 7,50 | 20 | 13,00 | 5 |

665 Pcs

| N° Art. HSS | € |
|---|---|
| 57524 | 1.168,20 |

**Previos Roscado** / **Before Threading** / Pré-Taraudage

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 30 | 4,50 | 30 | 8,50 | 20 |
| 1,50 | 20 | 5,00 | 50 | 9,00 | 20 |
| 2,00 | 40 | 5,50 | 40 | 9,50 | 5 |
| 2,50 | 30 | 6,00 | 50 | 10,00 | 20 |
| 3,00 | 50 | 6,50 | 20 | 10,20 | 5 |
| 3,30 | 30 | 6,80 | 10 | 11,00 | 5 |
| 3,50 | 30 | 7,00 | 20 | 12,00 | 10 |
| 4,00 | 50 | 7,50 | 20 | 13,00 | 5 |
| 4,20 | 30 | 8,00 | 40 | | |

680 Pcs

| N° Art. HSS | € |
|---|---|
| 57976 | 1.219,00 |

# Sets 1010

**BROCA USO GENERAL**
General Purpose Drill Bit
Foret utilisation générale

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 10 | 5,50 | 10 | 10,00 | 10 |
| 1,50 | 10 | 6,00 | 30 | 10,50 | 5 |
| 2,00 | 20 | 6,50 | 10 | 11,00 | 5 |
| 2,50 | 20 | 7,00 | 10 | 11,50 | 5 |
| 3,00 | 50 | 7,50 | 10 | 12,00 | 5 |
| 3,50 | 30 | 8,00 | 20 | 12,50 | 5 |
| 4,00 | 40 | 8,50 | 10 | 13,00 | 5 |
| 4,50 | 20 | 9,00 | 10 | | |
| 5,00 | 40 | 9,50 | 10 | | |

400 Pcs

| N° Art. HSS | € |
|---|---|
| 55440 | 702,40 |

**Cuartos** / **Quarters** / Quarts

| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 30 | 4,25 | 10 | 8,00 | 40 |
| 1,50 | 20 | 4,50 | 20 | 8,50 | 10 |
| 2,00 | 40 | 5,00 | 80 | 9,00 | 10 |
| 2,50 | 30 | 5,50 | 10 | 9,50 | 10 |
| 3,00 | 80 | 6,00 | 60 | 10,00 | 30 |
| 3,25 | 20 | 6,50 | 20 | 11,00 | 15 |
| 3,50 | 20 | 7,00 | 20 | 12,00 | 20 |
| 4,00 | 60 | 7,50 | 10 | 13,00 | 10 |

675 Pcs

| N° Art. HSS | € |
|---|---|
| 57523 | 1.168,40 |

**Previos Roscado** / **Before Threading** / Pré-Taraudage

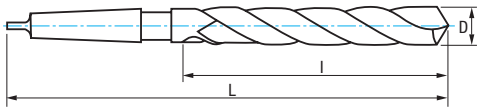
| Ø mm | Uds | Ø mm | Uds | Ø mm | Uds |
|---|---|---|---|---|---|
| 1,00 | 30 | 4,50 | 20 | 8,50 | 10 |
| 1,50 | 20 | 5,00 | 80 | 9,00 | 10 |
| 2,00 | 40 | 5,50 | 10 | 9,50 | 10 |
| 2,50 | 30 | 6,00 | 60 | 10,00 | 30 |
| 3,00 | 80 | 6,50 | 20 | 10,20 | 10 |
| 3,30 | 20 | 6,80 | 10 | 11,00 | 15 |
| 3,50 | 20 | 7,00 | 20 | 12,00 | 20 |
| 4,00 | 60 | 7,50 | 10 | 13,00 | 10 |
| 4,20 | 10 | 8,00 | 40 | | |

695 Pcs

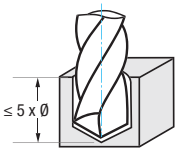
| N° Art. HSS | € |
|---|---|
| 57975 | 1.237,90 |

# Ref. 9196

## BROCA MANGO CÓNICO PUNTA METAL DURO. SERIE CORTA
Carbide Tipped Morse Taper Shank Drill Bit. Jobber Series
Foret queue cône morse pointe carbure. Série courte




| MD HM Carbure | DIN 345 N | 118° | | | White Flute (Black Helix) | **Rectificado Ground** Taillé meulé | Tol. D h7 |
|---|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 30 |
| P | P.2 | 30-50 | 0,045 | 0,050 | 0,055 | 0,070 | 0,080 | 0,080 | 0,090 |
| | P.3 | 10-15 | 0,040 | 0,040 | 0,050 | 0,050 | 0,060 | 0,070 | 0,080 |
| | P.5 | 12-25 | 0,040 | 0,040 | 0,050 | 0,050 | 0,060 | 0,070 | 0,080 |
| M | | 10-25 | 0,040 | 0,040 | 0,050 | 0,050 | 0,060 | 0,070 | 0,080 |
| K | K.1 | 50-90 | 0,060 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,160 |
| | K.2 | 40-60 | 0,040 | 0,050 | 0,050 | 0,060 | 0,060 | 0,070 | 0,080 |
| S | | 20-35 | 0,035 | 0,050 | 0,060 | 0,080 | 0,090 | 0,120 | 0,150 |
| N | N.1 | 40-100 | 0,100 | 0,120 | 0,140 | 0,160 | 0,180 | 0,180 | 0,200 |
| | N.2 | 40-100 | 0,100 | 0,120 | 0,140 | 0,160 | 0,180 | 0,180 | 0,200 |
| | N.7 | 20-100 | 0,060 | 0,065 | 0,070 | 0,080 | 0,120 | 0,150 | 0,200 |

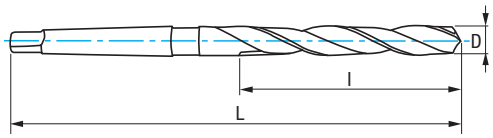
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | L mm | l mm | CM | N° Art. MD/HM | € |
|---|---|---|---|---|---|
| **8,00** | 156 | 75 | 1 | 73049 | **60,26** |
| **8,50** | 156 | 75 | 1 | 73052 | **65,18** |
| **9,00** | 162 | 81 | 1 | 73055 | **65,18** |
| **9,50** | 162 | 81 | 1 | 73058 | **65,18** |
| **10,00** | 168 | 87 | 1 | 73061 | **71,70** |
| **10,50** | 168 | 87 | 1 | 73064 | **71,70** |
| **11,00** | 175 | 94 | 1 | 73067 | **77,50** |
| **11,50** | 175 | 94 | 1 | 73070 | **77,50** |
| **12,00** | 182 | 101 | 1 | 73073 | **81,28** |
| **12,50** | 182 | 101 | 1 | 73076 | **81,28** |
| **13,00** | 182 | 101 | 1 | 73079 | **92,42** |
| **13,50** | 189 | 108 | 1 | 73082 | **92,42** |
| **14,00** | 189 | 108 | 1 | 73085 | **100,50** |
| **14,50** | 212 | 114 | 2 | 73088 | **100,50** |
| **15,00** | 212 | 114 | 2 | 73091 | **113,53** |
| **15,50** | 218 | 120 | 2 | 73094 | **121,32** |
| **16,00** | 218 | 120 | 2 | 73097 | **121,32** |
| **16,50** | 223 | 125 | 2 | 73100 | **121,32** |
| **17,00** | 223 | 125 | 2 | 74129 | **128,64** |
| **17,50** | 228 | 130 | 2 | 73103 | **128,64** |
| **18,00** | 228 | 130 | 2 | 73106 | **138,90** |
| **18,50** | 233 | 135 | 2 | 73109 | **162,51** |
| **19,00** | 233 | 135 | 2 | 73112 | **162,51** |

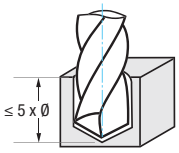
| D mm | L mm | l mm | CM | N° Art. MD/HM | € |
|---|---|---|---|---|---|
| **19,50** | 238 | 140 | 2 | 73115 | **182,63** |
| **20,00** | 238 | 140 | 2 | 73118 | **182,63** |
| **20,50** | 243 | 145 | 2 | 73121 | **185,20** |
| **21,00** | 243 | 145 | 2 | 73124 | **185,20** |
| **21,50** | 248 | 150 | 2 | 73127 | **202,18** |
| **22,00** | 248 | 150 | 2 | 74132 | **202,18** |
| **22,50** | 248 | 150 | 2 | 73130 | **202,18** |
| **23,00** | 253 | 155 | 2 | 73133 | **219,90** |
| **23,50** | 276 | 155 | 3 | 73136 | **219,90** |
| **24,00** | 281 | 160 | 3 | 73139 | **241,64** |
| **24,50** | 281 | 160 | 3 | 73142 | **241,64** |
| **25,00** | 281 | 160 | 3 | 73145 | **247,43** |
| **26,00** | 286 | 165 | 3 | 73151 | **278,06** |
| **27,00** | 291 | 170 | 3 | 73157 | **296,68** |
| **28,00** | 291 | 170 | 3 | 73163 | **328,28** |
| **29,00** | 296 | 175 | 3 | 73169 | **349,59** |
| **30,00** | 296 | 175 | 3 | 73172 | **371,99** |
| **31,00** | 301 | 180 | 3 | 73175 | **492,41** |
| **32,00** | 334 | 185 | 4 | 73178 | **492,41** |
| **33,00** | 334 | 185 | 4 | 73181 | **606,85** |
| **34,00** | 339 | 190 | 4 | 73184 | **606,85** |
| **35,00** | 339 | 190 | 4 | 73187 | **606,85** |

# Ref. 9116

## BROCA MANGO CÓNICO INOX. SERIE CORTA
Stainless Steel Morse Taper Shank Drill Bit. Jobber Series
Foret queue cóne morse inoxydable. Série courte




| HSSE 5% Co | DIN 345 N | 118° | Blanca Bright Finish Finition blanche | Rectificado Ground Taillé meulé | Afilado Split Point Affûtage | "S" | Ø > 11,50 mm | Tol. D h8 |
|---|---|---|---|---|---|---|---|---|




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

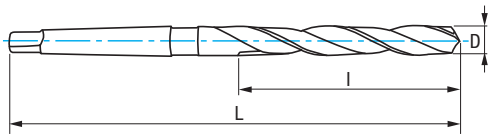
| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 30 | Ø 40 |
| P | P.2 | 20-25 | 0,120 | 0,130 | 0,160 | 0,200 | 0,250 | 0,260 | 0,300 |
| | P.5 | 8-12 | 0,100 | 0,120 | 0,150 | 0,170 | 0,210 | 0,250 | 0,300 |
| M | | 6-12 | 0,100 | 0,120 | 0,150 | 0,170 | 0,210 | 0,250 | 0,300 |
| K | K.1 | 30-35 | 0,210 | 0,250 | 0,300 | 0,360 | 0,430 | 0,510 | 0,620 |
| | K.2 | 40-60 | 0,170 | 0,200 | 0,240 | 0,280 | 0,340 | 0,410 | 0,490 |
| S | | 10-15 | 0,210 | 0,250 | 0,300 | 0,360 | 0,430 | 0,510 | 0,620 |
| N | N.1 | 30-40 | 0,170 | 0,200 | 0,240 | 0,280 | 0,340 | 0,410 | 0,490 |
| | N.2 | 30-40 | 0,210 | 0,250 | 0,300 | 0,360 | 0,430 | 0,510 | 0,620 |

| D mm | L mm | l mm | CM | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| 10,00 | 168 | 84 | 1 | 74650 | 63,41 |
| 10,50 | 168 | 84 | 1 | 74651 | 66,11 |
| 11,00 | 175 | 94 | 1 | 74652 | 63,37 |
| 11,50 | 175 | 94 | 1 | 74675 | 66,11 |
| DIAM. > 11,50 mm Afilado "S" Point | | | | | |
| 12,00 | 182 | 101 | 1 | 74676 | 67,78 |
| 12,50 | 182 | 101 | 1 | 74677 | 71,74 |
| 13,00 | 182 | 101 | 1 | 74678 | 69,63 |
| 13,50 | 189 | 108 | 1 | 74679 | 90,98 |
| 14,00 | 189 | 108 | 1 | 74680 | 89,22 |
| 14,50 | 212 | 114 | 2 | 74681 | 99,05 |
| 15,00 | 212 | 114 | 2 | 74682 | 90,98 |
| 15,50 | 218 | 120 | 2 | 74683 | 100,81 |
| 16,00 | 218 | 120 | 2 | 74684 | 97,26 |
| 16,50 | 223 | 125 | 2 | 74685 | 101,70 |
| 17,00 | 223 | 125 | 2 | 74686 | 100,81 |
| 17,50 | 228 | 130 | 2 | 74687 | 107,09 |
| 18,00 | 228 | 130 | 2 | 74688 | 105,30 |
| 18,50 | 233 | 135 | 2 | 74689 | 115,08 |
| 19,00 | 233 | 135 | 2 | 74690 | 112,43 |
| 19,50 | 238 | 140 | 2 | 74691 | 129,42 |
| 20,00 | 238 | 140 | 2 | 74692 | 125,81 |
| 20,50 | 243 | 145 | 2 | 74693 | 144,53 |

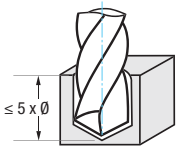
| D mm | L mm | l mm | CM | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| 21,00 | 243 | 145 | 2 | 74694 | 146,32 |
| 21,50 | 248 | 150 | 2 | 74695 | 165,13 |
| 22,00 | 248 | 150 | 2 | 74117 | 148,90 |
| 22,50 | 253 | 155 | 2 | 74696 | 183,81 |
| 23,00 | 253 | 155 | 2 | 74697 | 173,20 |
| 23,50 | 276 | 155 | 3 | 74698 | 183,81 |
| 24,00 | 281 | 160 | 3 | 74699 | 185,60 |
| 24,50 | 281 | 160 | 3 | 74700 | 198,14 |
| 25,00 | 281 | 160 | 3 | 74701 | 196,06 |
| 25,50 | 286 | 165 | 3 | 74702 | 242,80 |
| 26,00 | 286 | 165 | 3 | 74703 | 230,08 |
| 26,50 | 286 | 165 | 3 | 74704 | 255,20 |
| 27,00 | 291 | 170 | 3 | 74705 | 255,20 |
| 27,50 | 291 | 170 | 3 | 74706 | 305,17 |
| 28,00 | 291 | 170 | 3 | 74707 | 282,33 |
| 28,50 | 296 | 175 | 3 | 74708 | 312,32 |
| 29,00 | 296 | 175 | 3 | 74709 | 288,62 |
| 29,50 | 296 | 175 | 3 | 74710 | 319,48 |
| 30,00 | 296 | 175 | 3 | 74711 | 294,74 |
| 32,00 | 334 | 185 | 4 | 74714 | 312,29 |
| 33,00 | 334 | 185 | 4 | 74715 | 356,67 |
| 35,00 | 339 | 190 | 4 | 74717 | 423,82 |
| 36,00 | 344 | 195 | 4 | 74718 | 454,75 |
| 39,00 | 349 | 200 | 4 | 74721 | 537,70 |
| 40,00 | 349 | 200 | 4 | 74722 | 567,87 |

# Ref. 1110

## BROCA MANGO CÓNICO HSS. SERIE CORTA
HSS Morse Taper Shank Drill Bit. Jobber Series
Foret queue cóne morse HSS. Série courte




HSS | HSS + TIN | DIN 345 N | 118° | DIN 1412 A 14-40 mm | Blue Finish | **Rectificado Ground** Taillé meulé | Tol. D h8




| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | HSS | TIN |
| P | P.1 | 25-30 | 30-35 |
| | P.2 | 15-20 | 20-25 |
| K | K.1 | 30-35 | 36-42 |
| | K.2 | 25-30 | 30-36 |
| N | N.1 | 30-40 | 36-48 |
| | N.2 | 30-40 | 36-48 |

| Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 30 | Ø 40 |
| 0,080 | 0,100 | 0,120 | 0,150 | 0,160 | 0,180 | 0,250 | 0,300 | 0,310 | 0,400 |
| 0,060 | 0,080 | 0,100 | 0,120 | 0,130 | 0,160 | 0,200 | 0,250 | 0,260 | 0,300 |
| 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 | 0,430 | 0,510 | 0,620 |
| 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,280 | 0,340 | 0,410 | 0,490 |
| 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,280 | 0,340 | 0,410 | 0,490 |
| 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 | 0,430 | 0,510 | 0,620 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | L mm | l mm | CM | N° Art. HSS | € | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|
| 5,00 | 133 | 52 | 1 | 14426 | 14,76 | | |
| 5,25 | 133 | 52 | 1 | 14429 | 16,97 | | |
| 5,50 | 138 | 57 | 1 | 14432 | 14,76 | | |
| 5,75 | 138 | 57 | 1 | 14435 | 16,97 | | |
| 6,00 | 138 | 57 | 1 | 14438 | 14,76 | | |
| 6,25 | 144 | 63 | 1 | 14441 | 19,33 | | |
| 6,50 | 144 | 63 | 1 | 14444 | 15,70 | 27616 | 21,60 |
| 6,75 | 150 | 69 | 1 | 14447 | 18,05 | 27617 | 23,83 |
| 7,00 | 150 | 69 | 1 | 14450 | 15,70 | | |
| 7,25 | 150 | 69 | 1 | 14453 | 20,77 | | |
| 7,50 | 150 | 69 | 1 | 14456 | 16,89 | | |
| 7,75 | 156 | 75 | 1 | 14459 | 20,77 | | |
| 8,00 | 156 | 75 | 1 | 14462 | 16,83 | 10590 | 22,67 |
| 8,25 | 156 | 75 | 1 | 14465 | 24,37 | | |
| 8,50 | 156 | 75 | 1 | 14468 | 18,31 | 18636 | 24,48 |
| 8,75 | 162 | 81 | 1 | 14471 | 21,90 | | |
| 9,00 | 162 | 81 | 1 | 14474 | 18,31 | | |
| 9,25 | 162 | 81 | 1 | 14477 | 24,22 | | |
| 9,50 | 162 | 81 | 1 | 14480 | 18,08 | | |
| 9,75 | 168 | 87 | 1 | 14483 | 24,22 | | |
| 10,00 | 168 | 87 | 1 | 14486 | 17,76 | 27209 | 30,05 |
| 10,25 | 168 | 87 | 1 | 14489 | 22,67 | 19677 | 32,76 |
| 10,50 | 168 | 87 | 1 | 14492 | 19,69 | | |
| 10,75 | 175 | 94 | 1 | 14495 | 22,67 | | |
| 11,00 | 175 | 94 | 1 | 14498 | 19,69 | 22562 | 29,96 |
| 11,25 | 175 | 94 | 1 | 14501 | 23,84 | 67708 | 34,98 |
| 11,50 | 175 | 94 | 1 | 14504 | 20,74 | | |
| 11,75 | 175 | 94 | 1 | 14507 | 23,84 | | |
| 12,00 | 182 | 101 | 1 | 14510 | 20,74 | 22568 | 30,95 |
| 12,25 | 182 | 101 | 1 | 14513 | 26,54 | | |
| 12,50 | 182 | 101 | 1 | 14516 | 22,21 | 22571 | 34,43 |
| 12,75 | 182 | 101 | 1 | 14519 | 26,54 | | |
| 13,00 | 182 | 101 | 1 | 14522 | 23,10 | 22574 | 35,29 |
| 13,25 | 189 | 108 | 1 | 14525 | 29,20 | 49243 | 41,05 |
| 13,50 | 189 | 108 | 1 | 14528 | 24,39 | 19713 | 36,53 |
| 13,75 | 189 | 108 | 1 | 14531 | 29,20 | | |
| 14,00 | 189 | 108 | 1 | 14534 | 24,39 | 22577 | 36,53 |
| 14,25 | 212 | 114 | 2 | 14537 | 31,62 | 19723 | 44,40 |
| 14,50 | 212 | 114 | 2 | 14540 | 27,52 | 22580 | 40,53 |
| 14,75 | 212 | 114 | 2 | 14543 | 31,62 | | |

| D mm | L mm | l mm | CM | N° Art. HSS | € | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|
| 15,00 | 212 | 114 | 2 | 14546 | 27,52 | 22583 | 40,53 |
| 15,25 | 218 | 120 | 2 | 14549 | 32,74 | | |
| 15,50 | 218 | 120 | 2 | 14552 | 28,46 | 22586 | 41,45 |
| 15,75 | 218 | 120 | 2 | 14555 | 32,74 | | |
| 16,00 | 218 | 120 | 2 | 14558 | 28,46 | 22589 | 41,45 |
| 16,25 | 223 | 125 | 2 | 14561 | 37,04 | | |
| 16,50 | 223 | 125 | 2 | 14564 | 32,19 | 22592 | 45,35 |
| 16,75 | 223 | 125 | 2 | 14567 | 37,04 | | |
| 17,00 | 223 | 125 | 2 | 14570 | 32,19 | 22595 | 45,35 |
| 17,25 | 228 | 130 | 2 | 14573 | 40,97 | | |
| 17,50 | 228 | 130 | 2 | 14576 | 35,62 | 27573 | 48,58 |
| 17,75 | 228 | 130 | 2 | 14579 | 40,97 | | |
| 18,00 | 228 | 130 | 2 | 14582 | 34,27 | 22598 | 47,30 |
| 18,25 | 233 | 135 | 2 | 14585 | 45,08 | 27004 | 64,73 |
| 18,50 | 233 | 135 | 2 | 14588 | 39,21 | 27560 | 59,20 |
| 18,75 | 233 | 135 | 2 | 14591 | 45,08 | | |
| 19,00 | 233 | 135 | 2 | 14594 | 39,21 | 27561 | 59,20 |
| 19,25 | 238 | 140 | 2 | 14597 | 49,07 | | |
| 19,50 | 238 | 140 | 2 | 14600 | 42,67 | 22601 | 62,30 |
| 19,75 | 238 | 140 | 2 | 14603 | 49,07 | | |
| 20,00 | 238 | 140 | 2 | 14606 | 42,67 | 22607 | 62,30 |
| 20,25 | 243 | 145 | 2 | 14609 | 50,87 | 67709 | 70,85 |
| 20,50 | 243 | 145 | 2 | 14612 | 44,23 | 22610 | 64,59 |
| 20,75 | 243 | 145 | 2 | 14615 | 50,87 | | |
| 21,00 | 243 | 145 | 2 | 14618 | 44,23 | 22613 | 68,37 |
| 21,25 | 248 | 150 | 2 | 14621 | 56,12 | 24531 | 79,57 |
| 21,50 | 248 | 150 | 2 | 14624 | 48,77 | 27593 | 72,66 |
| 21,75 | 248 | 150 | 2 | 14627 | 56,12 | 39985 | 79,57 |
| 22,00 | 248 | 150 | 2 | 14630 | 48,77 | 22616 | 72,66 |
| 22,25 | 248 | 150 | 2 | 14633 | 61,40 | | |
| 22,50 | 253 | 155 | 2 | 14636 | 53,39 | 27582 | 77,26 |
| 22,75 | 253 | 155 | 2 | 14639 | 61,40 | 18729 | 86,06 |
| 23,00 | 253 | 155 | 2 | 14642 | 53,39 | 27562 | 78,51 |
| 23,25 | 276 | 155 | 3 | 14645 | 67,74 | 67710 | 92,05 |
| 23,50 | 276 | 155 | 3 | 14648 | 58,90 | 15079 | 83,71 |
| 23,75 | 281 | 160 | 3 | 14651 | 67,74 | 67711 | 92,05 |
| 24,00 | 281 | 160 | 3 | 14654 | 58,90 | 22622 | 83,71 |
| 24,25 | 281 | 160 | 3 | 14657 | 73,89 | | |
| 24,50 | 281 | 160 | 3 | 14660 | 64,23 | 22625 | 98,85 |
| 24,75 | 281 | 160 | 3 | 14663 | 73,89 | | |

# Ref. 1110

## BROCA MANGO CÓNICO HSS. SERIE CORTA
HSS Morse Taper Shank Drill Bit. Jobber Series
Foret queue cóne morse HSS. Série courte

| D mm | L mm | l mm | CM | N° Art. HSS | € | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|
| **25,00** | 281 | 160 | 3 | 14666 | **64,23** | 22628 | **98,85** |
| **25,25** | 286 | 165 | 3 | 14669 | **80,38** | | |
| **25,50** | 286 | 165 | 3 | 14672 | **69,88** | 79571 | **103,92** |
| **25,75** | 286 | 165 | 3 | 14675 | **80,38** | | |
| **26,00** | 286 | 165 | 3 | 14678 | **69,88** | 22634 | **103,92** |
| **26,25** | 286 | 165 | 3 | 14681 | **87,03** | | |
| **26,50** | 286 | 165 | 3 | 14684 | **75,68** | 19798 | **109,15** |
| **26,75** | 291 | 170 | 3 | 14687 | **87,03** | 67712 | **119,84** |
| **27,00** | 291 | 170 | 3 | 14690 | **75,68** | 26741 | **109,15** |
| **27,25** | 291 | 170 | 3 | 14693 | **93,14** | | |
| **27,50** | 291 | 170 | 3 | 14696 | **81,03** | 26744 | **113,94** |
| **27,75** | 291 | 170 | 3 | 14699 | **93,14** | | |
| **28,00** | 291 | 170 | 3 | 14702 | **81,03** | 22637 | **113,94** |
| **28,25** | 296 | 175 | 3 | 14705 | **99,93** | | |
| **28,50** | 296 | 175 | 3 | 14708 | **86,88** | 22640 | **126,92** |
| **28,75** | 296 | 175 | 3 | 14711 | **99,93** | 67713 | **139,23** |
| **29,00** | 296 | 175 | 3 | 14714 | **86,88** | 26747 | **126,92** |
| **29,25** | 296 | 175 | 3 | 14717 | **109,87** | 67714 | **148,60** |
| **29,50** | 296 | 175 | 3 | 14720 | **95,53** | 22643 | **135,08** |
| **29,75** | 296 | 175 | 3 | 14723 | **109,87** | | |
| **30,00** | 296 | 175 | 3 | 14726 | **95,53** | 22646 | **135,08** |
| **30,25** | 301 | 180 | 3 | 14729 | **122,26** | | |
| **30,50** | 301 | 180 | 3 | 14732 | **106,31** | 19813 | **141,80** |
| **30,75** | 301 | 180 | 3 | 14735 | **122,26** | | |
| **31,00** | 301 | 180 | 3 | 14738 | **106,31** | 26750 | **141,80** |
| **31,25** | 301 | 180 | 3 | 14741 | **129,47** | 67715 | **176,10** |
| **31,50** | 301 | 180 | 3 | 14744 | **112,57** | | |
| **31,75** | 306 | 185 | 3 | 14747 | **129,47** | | |
| **32,00** | 334 | 185 | 4 | 14750 | **112,57** | 22649 | **160,13** |
| **32,50** | 334 | 185 | 4 | 14753 | **128,60** | | |
| **33,00** | 334 | 185 | 4 | 14756 | **128,60** | 22652 | **174,54** |
| **33,50** | 334 | 185 | 4 | 14759 | **139,82** | 59215 | **184,09** |
| **34,00** | 339 | 190 | 4 | 14762 | **139,82** | 22655 | **177,34** |
| **34,50** | 339 | 190 | 4 | 14765 | **152,79** | | |
| **35,00** | 339 | 190 | 4 | 14768 | **152,79** | 27574 | **196,32** |
| **35,50** | 339 | 190 | 4 | 14771 | **163,94** | 19830 | **205,33** |
| **36,00** | 344 | 195 | 4 | 14774 | **163,94** | 22658 | **205,33** |
| **36,50** | 344 | 195 | 4 | 14777 | **172,81** | | |
| **37,00** | 344 | 195 | 4 | 14780 | **172,81** | | |
| **37,50** | 344 | 195 | 4 | 14783 | **181,77** | 27523 | **223,66** |
| **38,00** | 349 | 200 | 4 | 14786 | **181,77** | 22667 | **223,66** |
| **38,50** | 349 | 200 | 4 | 14789 | **193,85** | | |
| **39,00** | 349 | 200 | 4 | 14792 | **193,85** | 28009 | **233,56** |
| **39,50** | 349 | 200 | 4 | 14795 | **204,69** | 67716 | **243,78** |
| **40,00** | 349 | 200 | 4 | 14798 | **204,69** | 22670 | **243,78** |
| **40,50** | 354 | 205 | 4 | 14801 | **215,23** | | |
| **41,00** | 354 | 205 | 4 | 14804 | **215,23** | 67717 | **265,83** |
| **41,50** | 354 | 205 | 4 | 14807 | **228,39** | | |
| **42,00** | 354 | 205 | 4 | 14810 | **228,39** | 27575 | **278,33** |
| **42,50** | 354 | 205 | 4 | 14813 | **239,57** | | |
| **43,00** | 359 | 210 | 4 | 14816 | **239,57** | | |
| **43,50** | 359 | 210 | 4 | 14819 | **250,81** | 67718 | **299,48** |
| **44,00** | 359 | 210 | 4 | 14822 | **250,81** | 27315 | **299,48** |
| **44,50** | 359 | 210 | 4 | 14825 | **261,87** | | |
| **45,00** | 359 | 210 | 4 | 14828 | **261,87** | | |
| **45,50** | 364 | 215 | 4 | 14831 | **272,93** | 41292 | **334,10** |
| **46,00** | 364 | 215 | 4 | 14834 | **272,93** | 27577 | **334,10** |
| **46,50** | 364 | 215 | 4 | 14837 | **284,03** | 67719 | **344,58** |
| **47,00** | 364 | 215 | 4 | 14840 | **284,03** | | |

| D mm | L mm | l mm | CM | N° Art. HSS | € | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|
| **47,50** | 364 | 215 | 4 | 14843 | **293,59** | | |
| **48,00** | 369 | 220 | 4 | 14846 | **293,59** | 13131 | **353,62** |
| **48,50** | 369 | 220 | 4 | 14849 | **304,86** | | |
| **49,00** | 369 | 220 | 4 | 14852 | **304,86** | | |
| **49,50** | 369 | 220 | 4 | 14855 | **315,93** | 67720 | **374,68** |
| **50,00** | 369 | 220 | 4 | 14858 | **315,93** | 26753 | **374,68** |
| **51,00** | 412 | 225 | 5 | 14864 | **372,96** | | |
| **52,00** | 412 | 225 | 5 | 14867 | **397,64** | | |
| **53,00** | 412 | 225 | 5 | 14870 | **424,30** | | |
| **54,00** | 417 | 230 | 5 | 14873 | **469,18** | | |
| **55,00** | 417 | 230 | 5 | 14876 | **462,94** | 58497 | **509,70** |
| **56,00** | 417 | 230 | 5 | 14879 | **522,56** | | |
| **57,00** | 422 | 235 | 5 | 14882 | **552,95** | | |
| **58,00** | 422 | 235 | 5 | 14885 | **556,39** | | |
| **59,00** | 422 | 235 | 5 | 14888 | **574,32** | | |
| **60,00** | 422 | 235 | 5 | 14891 | **546,05** | | |
| **61,00** | 427 | 240 | 5 | 14894 | **639,13** | | |
| **62,00** | 427 | 240 | 5 | 14897 | **665,67** | | |
| **63,00** | 427 | 240 | 5 | 14900 | **703,96** | | |
| **64,00** | 432 | 245 | 5 | 14903 | **742,73** | | |
| **65,00** | 432 | 245 | 5 | 14906 | **713,28** | 68996 | **781,57** |
| **66,00** | 432 | 245 | 5 | 14909 | **801,66** | | |
| **67,00** | 432 | 245 | 5 | 14912 | **827,54** | | |
| **68,00** | 437 | 250 | 5 | 14915 | **849,02** | | |
| **69,00** | 437 | 250 | 5 | 14918 | **875,37** | | |
| **70,00** | 437 | 250 | 5 | 14921 | **829,99** | | |
| **>70 mm bajo demanda** / **upon request** / sur demande | | | | | | | |
| **71,00** | 437 | 250 | 5 | 14924 | **958,25** | | |
| **72,00** | 442 | 255 | 5 | 14927 | **978,10** | | |
| **73,00** | 442 | 255 | 5 | 14930 | **1.003,72** | | |
| **74,00** | 442 | 255 | 5 | 14933 | **1.033,08** | | |
| **75,00** | 442 | 255 | 5 | 14936 | **973,11** | | |
| **76,00** | 447 | 260 | 5 | 14939 | **1.145,88** | | |
| **77,00** | 514 | 260 | 6 | 14942 | **1.229,66** | | |
| **78,00** | 514 | 260 | 6 | 14945 | **1.253,68** | | |
| **79,00** | 514 | 260 | 6 | 14948 | **1.278,92** | | |
| **80,00** | 514 | 260 | 6 | 14951 | **1.349,25** | | |
| **81,00** | 519 | 265 | 6 | 14954 | **1.485,54** | | |
| **82,00** | 519 | 265 | 6 | 14957 | **1.522,65** | | |
| **83,00** | 519 | 265 | 6 | 14960 | **1.551,87** | | |
| **84,00** | 519 | 265 | 6 | 14963 | **1.584,82** | | |
| **85,00** | 519 | 265 | 6 | 14966 | **1.623,97** | | |
| **86,00** | 524 | 270 | 6 | 14969 | **1.659,42** | | |
| **87,00** | 524 | 270 | 6 | 14972 | **1.694,70** | | |
| **88,00** | 524 | 270 | 6 | 14975 | **1.738,24** | | |
| **89,00** | 524 | 270 | 6 | 14978 | **1.771,85** | | |
| **90,00** | 524 | 270 | 6 | 14981 | **1.822,61** | | |
| **91,00** | 529 | 275 | 6 | 14984 | **1.922,31** | | |
| **92,00** | 529 | 275 | 6 | 14987 | **1.933,37** | | |
| **93,00** | 529 | 275 | 6 | 14990 | **2.002,33** | | |
| **94,00** | 529 | 275 | 6 | 14993 | **2.043,03** | | |
| **95,00** | 529 | 275 | 6 | 14996 | **2.085,01** | | |
| **96,00** | 534 | 280 | 6 | 14999 | **2.153,72** | | |
| **97,00** | 534 | 280 | 6 | 15002 | **2.171,76** | | |
| **98,00** | 534 | 280 | 6 | 15005 | **2.220,20** | | |
| **99,00** | 534 | 280 | 6 | 15008 | **2.260,35** | | |
| **100,00** | 534 | 280 | 6 | 15011 | **2.303,45** | | |

# Ref. 1110

## BROCA MANGO CÓNICO HSS. SERIE CORTA
HSS Morse Taper Shank Drill Bit. Jobber Series
Foret queue cóne morse HSS. Série courte

### Set 25 Pcs

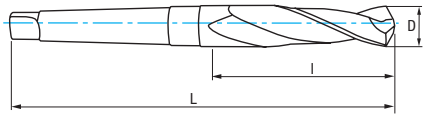
| Cont. Ø | N° Art. HSS | € |
|---|---|---|
| **14-14,5-15-15,5-16-16,5-17-17,5-18-18,5-19-19,5-20-20,5-21-21,5-22-22,5-23-24-25-26-27-28-30 mm** | 14263 | **1.303,05** |

### Set 10 Pcs

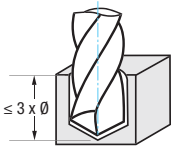
| Cont. Ø | N° Art. HSS | € |
|---|---|---|
| **14-15-16-17- 18-19-20-21-22-25 mm** | 19346 | **436,99** |

# Ref. 1154

## BROCA MANGO CÓNICO MAT.S ALTA RESISTENCIA. SERIE EXTRA CORTA
High Resistance Materials Morse Taper Shank Drill Bit. Stub Series
Foret queue cóne morse matériaux haute résistance. Série extra-courte




Cobalt "S" | X-AlCr | IZAR Std. | | | 135° | **Rectificado Ground** Taillé meulé | Tol. D h8 | **Por ejemplo For instance** Par exemple **HARDOX®** wear plate




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | Cobalt "S" | Ø 20 | Ø 25 | Ø 30 | Ø 40 | Ø 60 |
| P | P.4 | 6-8 | 0,180 | 0,200 | 0,220 | 0,310 | 0,450 |

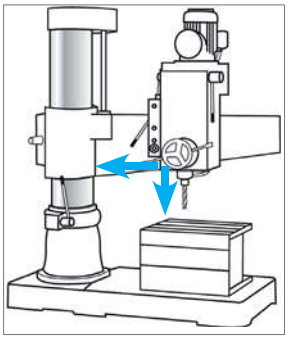
**r.p.m.** = $\frac{Vc \times 1.000}{\pi \times ø}$ | **Vf (mm/min.) = r.p.m. x f**

| D mm | L mm | l mm | CM | N° Art. X-AlCr | € |
|---|---|---|---|---|---|
| **14,00** | 145 | 64 | 1 | 59788 | **99,46** |
| **16,00** | 169 | 71 | 2 | 59792 | **112,87** |
| **18,00** | 175 | 77 | 2 | 37409 | **137,40** |
| **19,00** | 182 | 80 | 2 | 39990 | **161,44** |
| **20,00** | 185 | 83 | 2 | 39991 | **177,85** |
| **21,00** | 189 | 87 | 2 | 39992 | **197,09** |
| **22,00** | 192 | 90 | 2 | 39993 | **209,01** |
| **23,00** | 196 | 94 | 2 | 39994 | **224,22** |

| D mm | L mm | l mm | CM | N° Art. X-AlCr | € |
|---|---|---|---|---|---|
| **24,00** | 219 | 98 | 3 | 39995 | **234,59** |
| **25,00** | 219 | 98 | 3 | 39996 | **262,72** |
| **26,00** | 224 | 103 | 3 | 39997 | **281,01** |
| **27,00** | 231 | 107 | 3 | 39998 | **297,14** |
| **28,00** | 231 | 107 | 3 | 39999 | **315,23** |
| **30,00** | 236 | 112 | 3 | 40000 | **352,38** |
| ***32,00** | 271 | 122 | 4 | 70809 | |
| ***33,00** | 271 | 122 | 4 | 70812 | |

| D mm | L mm | l mm | CM | N° Art. X-AlCr | € |
|---|---|---|---|---|---|
| ***35,00** | 274 | 125 | 4 | 70814 | |
| ***36,00** | 277 | 128 | 4 | 70815 | |
| ***37,00** | 277 | 128 | 4 | 70817 | |
| ***40,00** | 300 | 151 | 4 | 70818 | |
| ***50,00** | 304 | 154 | 4 | 63995 | |
| ***55,00** | 345 | 158 | 5 | 70820 | |
| ***56,00** | 345 | 158 | 5 | 70822 | |
| ***60,00** | 352 | 165 | 5 | 60232 | |

*** Diam. bajo demanda / upon request** / sur demande



**Es vital minimizar las vibraciones a la hora de taladrar:**
- **Minimizar el voladizo de la columna al taladro**
- **Anclar la pieza con bridas de fijación**
- **Utilizar brocas cortas para minimizar la flexión**
- **Aplicar abundante refrigeración**

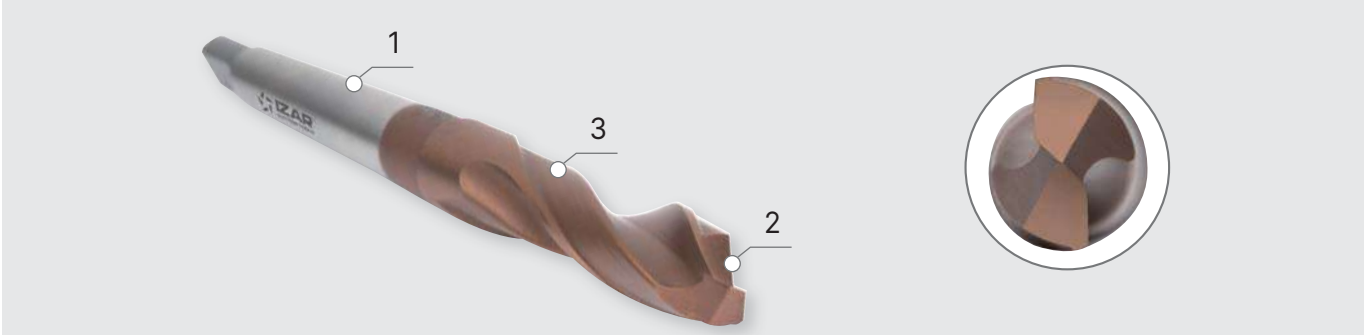
**It is vital to minimize vibrations when drilling:**
- **Minimize the distance between drill and column**
- **Clamp the workpiece securely**
- **Use short drill bits in order to minimize flexure**
- **Provide abundant supply of coolant**

C´est vital minimiser les vibrations au moment du perçage:
- Approcher la perceuse à colonne
- Fixer bien la pièce à usiner
- Employer des forets courts pour minimiser la flexibilité
- Refroidissez au maximum.

**1- Broca de Alto Rendimiento en Taladros Columna / CNC**
**2- Nueva Geometría especial con Nucleo Reforzado que resiste mejor las Fuerzas de Corte**
**3- Nuevo Recubrimiento con base AlCr que reduce el Desgaste en el Filo de Corte**

**1- High Performance Drill Bit in Stationary Drilling Machines / CNC**
**2- New special Reinforced Web that resists Cutting Forces better**
**3- New AlCr based Coating that reduces Cutting Edge Wear**

1- Foret haute performance pour perceuses à colonne / CNC
2- Nouvelle geométrie spéciale avec ame renforcée qui resiste mieux les forces de coupe
3- Nouveau revêtement AlCr qui réduit l'usure dans le fil de coupe

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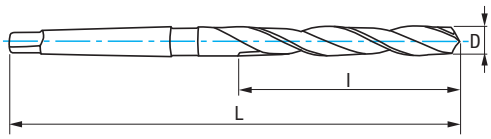
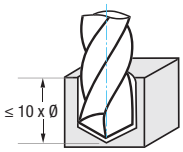
# Ref. 1130

## BROCA MANGO CÓNICO HSS. SERIE LARGA
HSS Morse Taper Shank Drill Bit. Long Series
Foret queue cóne morse HSS. Série longue




HSS | DIN 341 N | 118° | Blue Finish | **Rectificado Ground** Taillé meulé | Tol. D h8




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 30 | Ø 40 |
| P | P.1 | 25-30 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 | 0,180 | 0,250 | 0,300 | 0,310 | 0,400 |
| | P.2 | 15-20 | 0,060 | 0,080 | 0,100 | 0,120 | 0,130 | 0,160 | 0,200 | 0,250 | 0,260 | 0,300 |
| K | K.1 | 30-35 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 | 0,430 | 0,510 | 0,620 |
| | K.2 | 25-30 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,280 | 0,340 | 0,410 | 0,490 |
| N | N.1 | 30-40 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,280 | 0,340 | 0,410 | 0,490 |
| | N.2 | 30-40 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 | 0,430 | 0,510 | 0,620 |

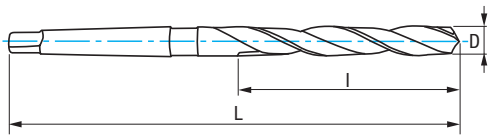
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| | D mm | L mm | l mm | CM | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| | 5,00 | 155 | 74 | 1 | 15122 | 21,40 |
| | 5,50 | 161 | 80 | 1 | 15125 | 28,65 |
| | 6,00 | 161 | 80 | 1 | 15128 | 22,73 |
| | 6,50 | 167 | 86 | 1 | 15131 | 23,22 |
| | 7,00 | 174 | 93 | 1 | 15137 | 24,66 |
| | 7,50 | 174 | 93 | 1 | 15140 | 25,92 |
| | 8,00 | 181 | 100 | 1 | 15143 | 26,38 |
| | 8,20 | 181 | 100 | 1 | 23621 | 35,96 |
| | 8,50 | 181 | 100 | 1 | 15146 | 26,38 |
| | 9,00 | 188 | 107 | 1 | 15152 | 29,08 |
| | 9,50 | 188 | 107 | 1 | 15155 | 31,82 |
| | 10,00 | 197 | 116 | 1 | 15164 | 32,78 |
| | 10,50 | 197 | 116 | 1 | 15167 | 34,14 |
| | 11,00 | 206 | 125 | 1 | 15170 | 32,78 |
| | 11,20 | 206 | 125 | 1 | 27071 | 32,78 |
| | 11,50 | 206 | 125 | 1 | 15173 | 32,78 |
| | 12,00 | 215 | 134 | 1 | 15176 | 35,06 |
| | 12,50 | 215 | 134 | 1 | 15179 | 35,96 |
| | 13,00 | 215 | 134 | 1 | 15182 | 35,96 |
| | 13,50 | 223 | 142 | 1 | 15185 | 39,15 |
| | 14,00 | 223 | 142 | 1 | 15188 | 40,45 |
| | 14,50 | 245 | 147 | 2 | 15194 | 50,94 |
| New! | 14,75 | 245 | 147 | 2 | 23720 | 58,54 |
| | 15,00 | 245 | 147 | 2 | 15197 | 50,94 |
| | 15,50 | 251 | 153 | 2 | 15200 | 50,01 |
| | 16,00 | 251 | 153 | 2 | 15203 | 51,86 |
| | 16,50 | 257 | 159 | 2 | 15206 | 56,39 |
| | 17,00 | 257 | 159 | 2 | 15209 | 56,39 |
| | 17,50 | 263 | 165 | 2 | 15212 | 64,59 |
| | 18,00 | 263 | 165 | 2 | 15218 | 62,75 |
| | 18,50 | 269 | 171 | 2 | 15221 | 70,94 |
| | 19,00 | 269 | 171 | 2 | 15224 | 66,41 |
| | 19,50 | 275 | 177 | 2 | 15227 | 77,34 |
| | 20,00 | 275 | 177 | 2 | 15230 | 70,94 |
| | 20,50 | 282 | 184 | 2 | 15233 | 90,97 |
| | 21,00 | 282 | 184 | 2 | 15236 | 81,87 |
| | 21,50 | 289 | 191 | 2 | 15239 | 99,14 |

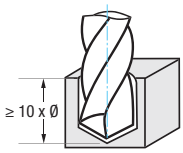
| D mm | L mm | l mm | CM | N° Art. HSS | € |
|---|---|---|---|---|---|
| 22,00 | 289 | 191 | 2 | 15242 | 92,82 |
| 22,50 | 296 | 198 | 2 | 15245 | 101,94 |
| 23,00 | 296 | 198 | 2 | 15248 | 92,82 |
| 23,50 | 319 | 198 | 3 | 15251 | 118,23 |
| 24,00 | 327 | 206 | 3 | 15254 | 119,14 |
| 24,50 | 327 | 206 | 3 | 15257 | 126,49 |
| 25,00 | 327 | 206 | 3 | 15260 | 119,14 |
| 25,50 | 335 | 214 | 3 | 15263 | 143,74 |
| 26,00 | 335 | 214 | 3 | 15266 | 125,57 |
| 26,50 | 335 | 214 | 3 | 15269 | 148,29 |
| 27,00 | 343 | 222 | 3 | 15272 | 135,55 |
| 27,50 | 343 | 222 | 3 | 15275 | 174,67 |
| 28,00 | 343 | 222 | 3 | 15278 | 154,66 |
| 28,50 | 351 | 230 | 3 | 15281 | 207,47 |
| 29,00 | 351 | 230 | 3 | 15284 | 169,18 |
| 29,50 | 351 | 230 | 3 | 15287 | 207,47 |
| 30,00 | 351 | 230 | 3 | 15290 | 173,71 |
| 30,50 | 360 | 239 | 3 | 15293 | 238,25 |
| 31,00 | 360 | 239 | 3 | 15296 | 220,19 |
| 31,50 | 360 | 239 | 3 | 15299 | 254,70 |
| 32,00 | 397 | 248 | 4 | 15302 | 220,19 |
| 32,50 | 397 | 248 | 4 | 15305 | 280,12 |
| 33,00 | 397 | 248 | 4 | 15308 | 234,72 |
| 33,50 | 397 | 248 | 4 | 15311 | 276,54 |
| 34,00 | 406 | 257 | 4 | 15314 | 285,55 |
| 34,50 | 406 | 257 | 4 | 15317 | 303,87 |
| 35,00 | 406 | 257 | 4 | 15320 | 287,49 |
| 35,50 | 406 | 257 | 4 | 15323 | 303,87 |
| 36,00 | 416 | 267 | 4 | 15326 | 331,25 |
| 36,50 | 416 | 267 | 4 | 15329 | 420,41 |
| 37,00 | 416 | 267 | 4 | 15332 | 358,34 |
| 37,50 | 416 | 267 | 4 | 15335 | 416,59 |
| 38,00 | 426 | 277 | 4 | 15338 | 373,10 |
| 38,50 | 426 | 277 | 4 | 15341 | 474,88 |
| 39,00 | 426 | 277 | 4 | 15344 | 389,25 |
| 39,50 | 426 | 277 | 4 | 15347 | 474,88 |
| 40,00 | 426 | 277 | 4 | 15350 | 422,07 |

# Ref. 1140

## BROCA MANGO CÓNICO HSS. SERIE EXTRA LARGA
HSS Morse Taper Shank Drill Bit. Extra Long Series
Foret queue cóne morse HSS. Série extra-longue




HSS | DIN 1870 N | 118° | Blue Finish | **Rectificado Ground** Taillé meulé | Tol. D h8




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 30 | Ø 40 |
| P | P.1 | 25-30 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 | 0,180 | 0,250 | 0,300 | 0,310 | 0,400 |
| | P.2 | 15-20 | 0,060 | 0,080 | 0,100 | 0,120 | 0,130 | 0,160 | 0,200 | 0,250 | 0,260 | 0,300 |
| K | K.1 | 30-35 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 | 0,430 | 0,510 | 0,620 |
| | K.2 | 25-30 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,280 | 0,340 | 0,410 | 0,490 |
| N | N.1 | 30-40 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,280 | 0,340 | 0,410 | 0,490 |
| | N.2 | 30-40 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 | 0,430 | 0,510 | 0,620 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | L mm | l mm | CM | N° Art. HSS | € |
|---|---|---|---|---|---|
| **8,00** | 265 | 165 | 1 | 15440 | **73,56** |
| **8,00** | 330 | 210 | 1 | 15443 | **91,71** |
| **8,50** | 265 | 165 | 1 | 15446 | **80,79** |
| **8,50** | 330 | 210 | 1 | 15449 | **93,76** |
| **9,00** | 275 | 175 | 1 | 15452 | **83,14** |
| **9,00** | 345 | 220 | 1 | 15455 | **105,72** |
| **9,50** | 275 | 175 | 1 | 15458 | **89,01** |
| **9,50** | 345 | 220 | 1 | 15461 | **106,83** |
| **10,00** | 285 | 185 | 1 | 15464 | **91,44** |
| **10,00** | 360 | 235 | 1 | 15467 | **112,74** |
| **10,50** | 285 | 185 | 1 | 15470 | **97,09** |
| **10,50** | 360 | 235 | 1 | 15473 | **116,24** |
| **11,00** | 300 | 195 | 1 | 15476 | **101,36** |
| **11,00** | 375 | 250 | 1 | 15479 | **120,55** |
| **11,50** | 300 | 195 | 1 | 15482 | **111,00** |
| **11,50** | 375 | 250 | 1 | 15485 | **138,61** |
| **12,00** | 310 | 205 | 1 | 15488 | **113,60** |
| **12,00** | 395 | 260 | 1 | 15491 | **141,53** |
| **12,50** | 310 | 205 | 1 | 15494 | **120,89** |
| **12,50** | 395 | 260 | 1 | 15497 | **158,00** |
| **13,00** | 310 | 205 | 1 | 15500 | **120,89** |
| **13,00** | 395 | 260 | 1 | 15503 | **158,00** |
| **13,50** | 325 | 220 | 1 | 15506 | **132,38** |
| **13,50** | 410 | 275 | 1 | 15509 | **162,23** |
| **14,00** | 325 | 220 | 1 | 15512 | **132,38** |
| **14,00** | 410 | 275 | 1 | 15515 | **162,23** |
| **14,50** | 340 | 220 | 2 | 15518 | **144,97** |
| **14,50** | 425 | 275 | 2 | 15521 | **176,69** |
| **15,00** | 340 | 220 | 2 | 15524 | **144,97** |
| **15,00** | 425 | 275 | 2 | 15527 | **176,69** |
| **15,50** | 355 | 230 | 2 | 15530 | **162,53** |
| **15,50** | 445 | 295 | 2 | 15533 | **194,90** |
| **16,00** | 355 | 230 | 2 | 15536 | **162,53** |
| **16,00** | 445 | 295 | 2 | 15539 | **194,90** |
| **16,50** | 355 | 230 | 2 | 15542 | **175,13** |
| **16,50** | 445 | 295 | 2 | 15545 | **210,61** |
| **17,00** | 355 | 230 | 2 | 15548 | **175,13** |
| **17,00** | 445 | 295 | 2 | 15551 | **210,61** |

| D mm | L mm | l mm | CM | N° Art. HSS | € |
|---|---|---|---|---|---|
| **17,50** | 370 | 245 | 2 | 15554 | **192,73** |
| **17,50** | 465 | 310 | 2 | 15557 | **231,88** |
| **18,00** | 370 | 245 | 2 | 15560 | **192,73** |
| **18,00** | 465 | 310 | 2 | 15563 | **231,88** |
| **18,50** | 370 | 245 | 2 | 15566 | **208,92** |
| **18,50** | 465 | 310 | 2 | 15569 | **250,61** |
| **19,00** | 370 | 245 | 2 | 15572 | **208,92** |
| **19,00** | 465 | 310 | 2 | 15575 | **250,61** |
| **19,50** | 385 | 260 | 2 | 15578 | **223,12** |
| **19,50** | 490 | 325 | 2 | 15581 | **271,22** |
| **20,00** | 385 | 260 | 2 | 15584 | **223,12** |
| **20,00** | 490 | 325 | 2 | 15587 | **271,22** |
| **20,50** | 385 | 260 | 2 | 15590 | **252,74** |
| **20,50** | 490 | 325 | 2 | 15593 | **303,46** |
| **21,00** | 385 | 260 | 2 | 15596 | **252,74** |
| **21,00** | 490 | 325 | 2 | 15599 | **303,46** |
| **21,50** | 405 | 270 | 2 | 15602 | **269,51** |
| **21,50** | 515 | 345 | 2 | 15605 | **325,72** |
| **22,00** | 405 | 270 | 2 | 15608 | **269,51** |
| **22,00** | 515 | 345 | 2 | 15611 | **325,72** |
| **22,50** | 405 | 270 | 2 | 15614 | **307,12** |
| **22,50** | 515 | 345 | 2 | 15617 | **367,66** |
| **23,00** | 405 | 270 | 2 | 15620 | **307,12** |
| **23,00** | 515 | 345 | 2 | 15623 | **367,66** |
| **23,50** | 425 | 270 | 3 | 15626 | **337,42** |
| **23,50** | 535 | 345 | 3 | 15629 | **409,17** |
| **24,00** | 440 | 290 | 3 | 15632 | **337,42** |
| **24,00** | 555 | 365 | 3 | 15635 | **409,17** |
| **24,50** | 440 | 290 | 3 | 15638 | **349,69** |
| **24,50** | 555 | 365 | 3 | 15641 | **431,20** |
| **25,00** | 440 | 290 | 3 | 15644 | **349,69** |
| **25,00** | 555 | 365 | 3 | 15647 | **431,20** |
| **25,50** | 440 | 290 | 3 | 15650 | **361,43** |
| **25,50** | 555 | 365 | 3 | 15653 | **476,37** |
| **26,00** | 440 | 290 | 3 | 15656 | **361,43** |
| **26,00** | 555 | 365 | 3 | 15659 | **476,37** |
| **26,50** | 440 | 290 | 3 | 15662 | **370,14** |
| **26,50** | 555 | 365 | 3 | 15665 | **491,51** |

# Ref. 1140

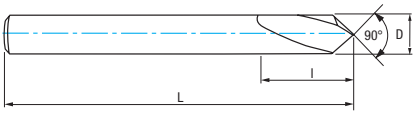
## BROCA MANGO CÓNICO HSS. SERIE EXTRA LARGA
HSS Morse Taper Shank Drill Bit. Extra Long Series
Foret queue cóne morse HSS. Série extra-longue

| D mm | L mm | l mm | CM | N° Art. HSS | € |
|---|---|---|---|---|---|
| **27,00** | 460 | 305 | 3 | 15668 | **370,14** |
| **27,00** | 580 | 385 | 3 | 15671 | **491,51** |
| **27,50** | 460 | 305 | 3 | 15674 | **394,84** |
| **27,50** | 580 | 385 | 3 | 15677 | **531,67** |
| **28,00** | 460 | 305 | 3 | 15680 | **394,84** |
| **28,00** | 580 | 385 | 3 | 15683 | **531,67** |
| **28,50** | 460 | 305 | 3 | 15686 | **409,17** |
| **28,50** | 580 | 385 | 3 | 15689 | **586,64** |
| **29,00** | 460 | 305 | 3 | 15692 | **409,17** |
| **29,00** | 580 | 385 | 3 | 15695 | **586,64** |
| **29,50** | 460 | 305 | 3 | 15698 | **423,60** |
| **29,50** | 580 | 385 | 3 | 15701 | **591,49** |
| **30,00** | 460 | 305 | 3 | 15704 | **423,60** |
| **30,00** | 580 | 385 | 3 | 15707 | **591,49** |
| **31,00** | 480 | 320 | 3 | 15710 | **474,87** |
| **31,00** | 610 | 410 | 3 | 15713 | **630,64** |
| **32,00** | 505 | 320 | 4 | 15716 | **496,49** |
| **32,00** | 635 | 410 | 4 | 15719 | **661,64** |
| **33,00** | 505 | 320 | 4 | 15722 | **541,01** |
| **33,00** | 635 | 410 | 4 | 15725 | **732,48** |
| **34,00** | 530 | 340 | 4 | 15728 | **586,64** |
| **34,00** | 665 | 430 | 4 | 15731 | **760,69** |
| **35,00** | 530 | 340 | 4 | 15734 | **604,19** |
| **35,00** | 665 | 430 | 4 | 15737 | **825,96** |

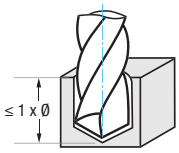
| D mm | L mm | l mm | CM | N° Art. HSS | € |
|---|---|---|---|---|---|
| **36,00** | 530 | 340 | 4 | 15740 | **651,85** |
| **36,00** | 665 | 430 | 4 | 15743 | **867,30** |
| **37,00** | 530 | 340 | 4 | 15746 | **668,32** |
| **37,00** | 665 | 430 | 4 | 15749 | **963,65** |
| **38,00** | 555 | 360 | 4 | 15752 | **729,04** |
| **38,00** | 695 | 460 | 4 | 15755 | **1.020,46** |
| **39,00** | 555 | 360 | 4 | 15758 | **759,81** |
| **39,00** | 695 | 460 | 4 | 15761 | **1.069,15** |
| **40,00** | 555 | 360 | 4 | 15764 | **801,00** |
| **40,00** | 695 | 460 | 4 | 15767 | **1.019,83** |
| **41,00** | 555 | 360 | 4 | 15770 | **901,69** |
| **41,00** | 695 | 460 | 4 | 15773 | **1.159,15** |
| **42,00** | 555 | 360 | 4 | 15776 | **931,40** |
| **42,00** | 695 | 460 | 4 | 15779 | **1.237,66** |
| **43,00** | 585 | 385 | 4 | 15782 | **971,29** |
| **43,00** | 735 | 490 | 4 | 15785 | **1.262,84** |
| **44,00** | 735 | 490 | 4 | 15791 | **1.307,16** |
| **45,00** | 735 | 490 | 4 | 15797 | **1.368,09** |
| **47,00** | 735 | 490 | 4 | 15809 | **1.499,38** |
| **48,00** | 605 | 405 | 4 | 15812 | **1.170,22** |
| **49,00** | 605 | 405 | 4 | 15818 | **1.205,86** |
| **49,00** | 765 | 510 | 4 | 15821 | **1.647,01** |
| **50,00** | 605 | 405 | 4 | 15824 | **1.241,36** |

# Ref. 1301

## BROCA CENTRAR CNC 90º
90º CNC Center Drill
Foret à centrer CNC 90º




| HSSE 5%Co | IZAR Std. | 90º | **Blanca Bright Finish** Finition blanche | **Rectificado Ground** Taillé meulé |
|---|---|---|---|---|




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 |
| P | P.1 | 20-25 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 | 0,180 | 0,250 | 0,300 |
| | P.2 | 8-12 | 0,045 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 | 0,130 | 0,160 | 0,200 | 0,250 |
| | P.3 | 6-10 | 0,035 | 0,045 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 | 0,160 | 0,180 |
| | P.5 | 6-10 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 | 0,150 | 0,170 | 0,210 |
| M | | 8-12 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 | 0,150 | 0,170 | 0,210 |
| K | K.1 | 20-24 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 | 0,430 |
| | K.2 | 15-20 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,280 | 0,340 |
| S | | 10-12 | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,160 |
| N | N.1 | 25-30 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,280 | 0,340 |
| | N.5 | 15-25 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 | 0,430 |
| | N.6 | 25-30 | 0,130 | 0,150 | 0,170 | 0,190 | 0,250 | 0,290 | 0,310 | 0,360 | 0,400 | 0,440 |

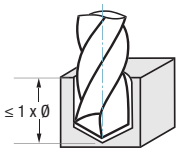
**r.p.m.** = $\frac{\text{Vc x 1.000}}{\pi \text{ x } \varnothing}$ | **Vf (mm/min.) = r.p.m. x f**

| D mm | L mm | l mm | N° Art. 5% Co | € |
|---|---|---|---|---|
| **3,00** | 50 | 10 | 69189 | **17,66** |
| **4,00** | 52 | 12 | 69190 | **17,66** |
| **5,00** | 60 | 15 | 69192 | **19,89** |
| **6,00** | 66 | 20 | 69193 | **19,89** |
| **8,00** | 79 | 25 | 69195 | **22,47** |
| **10,00** | 89 | 25 | 69196 | **22,47** |
| **12,00** | 102 | 30 | 69198 | **31,06** |
| **16,00** | 115 | 35 | 69199 | **42,82** |
| **20,00** | 131 | 40 | 69201 | **84,28** |
| **25,00** | 138 | 45 | 69202 | **109,19** |

# Ref. 1303

## BROCA CENTRAR CNC 120º
120º CNC Center Drill
Foret à centrer CNC 120º

| HSSE 5%Co | IZAR Std. | 120º | **Blanca** **Bright Finish** Finition blanche | **Rectificado** **Ground** Taillé meulé |
|---|---|---|---|---|



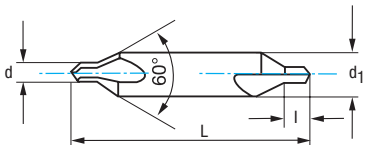

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 |
| P | P.1 | 20-25 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 | 0,180 | 0,250 | 0,300 |
| | P.2 | 8-12 | 0,045 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 | 0,130 | 0,160 | 0,200 | 0,250 |
| | P.3 | 6-10 | 0,035 | 0,045 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 | 0,160 | 0,180 |
| | P.5 | 6-10 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 | 0,150 | 0,170 | 0,210 |
| M | | 8-12 | 0,040 | 0,050 | 0,060 | 0,070 | 0,090 | 0,100 | 0,120 | 0,150 | 0,170 | 0,210 |
| K | K.1 | 20-24 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 | 0,430 |
| | K.2 | 15-20 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,280 | 0,340 |
| S | | 10-12 | 0,030 | 0,040 | 0,050 | 0,060 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,160 |
| N | N.1 | 25-30 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 | 0,240 | 0,280 | 0,340 |
| | N.5 | 15-25 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 | 0,300 | 0,360 | 0,430 |
| | N.6 | 25-30 | 0,130 | 0,150 | 0,170 | 0,190 | 0,250 | 0,290 | 0,310 | 0,360 | 0,400 | 0,440 |

**r.p.m.** = $\frac{Vc \times 1.000}{\pi \times ø}$ | **Vf (mm/min.) = r.p.m. x f**

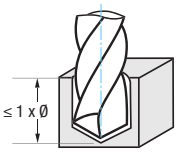
| D mm | L mm | l mm | Nº Art. 5% Co | € |
|---|---|---|---|---|
| **3,00** | 50 | 10 | 69204 | **17,66** |
| **4,00** | 52 | 12 | 69205 | **17,66** |
| **5,00** | 60 | 15 | 69207 | **19,89** |
| **6,00** | 66 | 20 | 69208 | **19,89** |
| **8,00** | 79 | 25 | 69210 | **22,47** |
| **10,00** | 89 | 25 | 69211 | **22,47** |
| **12,00** | 102 | 30 | 69216 | **31,06** |
| **16,00** | 115 | 35 | 69217 | **42,82** |
| **20,00** | 131 | 40 | 69219 | **84,28** |
| **25,00** | 138 | 45 | 69220 | **109,19** |

# Ref. 1310

## BROCA CENTRAR DOBLE
Double Center Drill
Foret à centrer double




HSS | HSS + TIN | DIN 333 A | Angular | 118° | **Blanca** Bright Finish Finition blanche | **Rectificado** Ground Taillé meulé



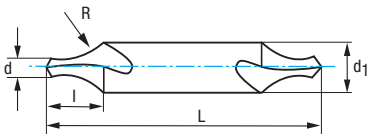

| Material | | Vc (m/min) | | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | TIN | Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| P | P.1 | 20-25 | 24-30 | 0,045 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 |
| | P.2 | 8-12 | 9-14 | 0,035 | 0,045 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 | 0,130 |
| K | K.1 | 20-24 | 24-28 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 |
| | K.2 | 15-20 | 18-24 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 |
| N | N.1 | 25-30 | 30-36 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 |
| | N.5 | 15-25 | 18-29 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

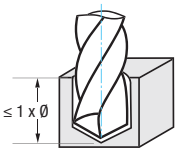
| | d mm | | d1 mm | L mm | l mm | N° Art. HSS | € | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|---|---|
| | **1,00** | x | **3,15** | 31,50 | 1,30 | 40001 | **4,96** | 74157 | **9,57** |
| | **1,25** | x | **3,15** | 31,50 | 1,60 | 40004 | **4,96** | 74160 | **9,57** |
| | **1,25** | x | **4,00** | 35,50 | 1,60 | 40007 | **5,27** | 74163 | **10,27** |
| | **1,60** | x | **4,00** | 35,50 | 2,00 | 40010 | **4,96** | 74885 | **10,01** |
| | **1,60** | x | **5,00** | 40,00 | 2,00 | 40013 | **5,27** | 74882 | **10,83** |
| | **2,00** | x | **5,00** | 40,00 | 2,50 | 40016 | **5,39** | 74166 | **10,96** |
| | **2,00** | x | **6,30** | 45,00 | 2,50 | 40019 | **5,78** | 74883 | **11,77** |
| | **2,50** | x | **6,30** | 45,00 | 3,10 | 40022 | **5,95** | 60380 | **11,93** |
| | **2,50** | x | **8,00** | 50,00 | 3,10 | 40025 | **6,56** | 74884 | **12,49** |
| | **3,15** | x | **8,00** | 50,00 | 3,90 | 40028 | **6,56** | 74169 | **12,49** |
| | **3,15** | x | **10,00** | 56,00 | 3,90 | 40031 | **7,71** | 73574 | **15,73** |
| | **4,00** | x | **10,00** | 56,00 | 5,00 | 40034 | **9,48** | 60383 | **17,37** |
| | **4,00** | x | **12,50** | 63,00 | 5,00 | 40037 | **10,55** | 74876 | **19,50** |
| | **5,00** | x | **12,50** | 63,00 | 6,30 | 40040 | **15,87** | 60386 | **22,23** |
| | **5,00** | x | **16,00** | 71,00 | 6,30 | 40043 | **25,28** | 74172 | **35,40** |
| New! | **6,30** | x | **16,00** | 71,00 | 8,00 | 40046 | **22,75** | 48671 | **28,63** |
| | **6,30** | x | **20,00** | 80,00 | 8,00 | 40049 | **38,59** | 14742 | **44,28** |
| | **8,00** | x | **20,00** | 80,00 | 10,10 | 40052 | **42,47** | 55428 | **48,58** |
| | **10,00** | x | **25,00** | 100,00 | 12,80 | 40055 | **65,73** | 14388 | **71,75** |
| New! | **12,50** | x | **31,50** | 125,00 | 16,50 | 74881 | **156,89** | 48674 | **175,10** |

# Ref. 1320

## BROCA CENTRAR DOBLE
Double Center Drill
Foret à centrer double




| HSS | DIN 333 R | Radial | 118° | **Blanca** **Bright Finish** Finition blanche | **Rectificado** **Ground** Taillé meulé |
|---|---|---|---|---|---|



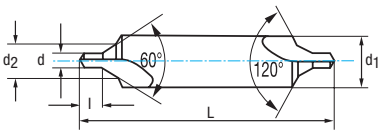

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| P | P.1 | 20-25 | 0,045 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 |
| | P.2 | 8-12 | 0,035 | 0,045 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 | 0,130 |
| K | K.1 | 20-24 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 |
| | K.2 | 15-20 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 |
| N | N.1 | 25-30 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 |
| | N.5 | 15-25 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = \text{r.p.m.} \times f$$

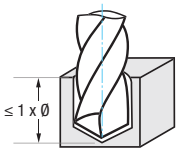
| d mm | | d1 mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| **1,00** | x | **3,15** | 31,50 | 3,00 | 40091 | **5,44** |
| **1,25** | x | **3,15** | 31,50 | 3,35 | 40094 | **5,44** |
| **1,25** | x | **4,00** | 35,50 | 3,75 | 40097 | **5,44** |
| **1,60** | x | **4,00** | 35,50 | 4,25 | 40100 | **5,44** |
| **1,60** | x | **5,00** | 40,00 | 4,75 | 40103 | **6,20** |
| **2,00** | x | **5,00** | 40,00 | 5,30 | 40106 | **5,90** |
| **2,00** | x | **6,30** | 45,00 | 6,00 | 40109 | **6,92** |
| **2,50** | x | **6,30** | 45,00 | 6,70 | 40112 | **6,56** |
| **2,50** | x | **8,00** | 50,00 | 7,50 | 40115 | **7,22** |
| **3,15** | x | **8,00** | 50,00 | 8,50 | 40118 | **7,22** |
| **3,15** | x | **10,00** | 56,00 | 9,50 | 40121 | **9,41** |
| **4,00** | x | **10,00** | 56,00 | 10,60 | 40124 | **9,41** |
| **4,00** | x | **12,50** | 63,00 | 11,80 | 40127 | **15,72** |
| **5,00** | x | **12,50** | 63,00 | 13,20 | 40130 | **15,79** |
| **5,00** | x | **16,00** | 71,00 | 15,00 | 40133 | **22,38** |
| **6,30** | x | **16,00** | 71,00 | 17,00 | 40136 | **22,52** |
| **6,30** | x | **20,00** | 80,00 | 19,00 | 40139 | **40,15** |
| **8,00** | x | **20,00** | 80,00 | 21,20 | 40142 | **46,41** |
| **10,00** | x | **25,00** | 100,00 | 31,50 | 40145 | **74,58** |
| **12,50** | x | **31,50** | 125,00 | 33,50 | 40148 | **161,82** |

# Ref. 1330

## BROCA CENTRAR DOBLE
Double Center Drill
Foret à centrer double



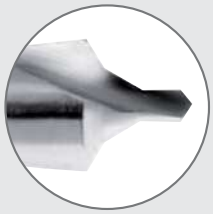

| HSS | Old DIN 320 | New DIN 333 B | Angular | 118° | **Blanca** **Bright Finish** Finition blanche | **Rectificado** **Ground** Taillé meulé |
|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 2 | Ø 3 | Ø 4 | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| P | P.1 | 20-25 | 0,045 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 |
| | P.2 | 8-12 | 0,035 | 0,045 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 | 0,130 |
| K | K.1 | 20-24 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 |
| | K.2 | 15-20 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 |
| N | N.1 | 25-30 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 |
| | N.5 | 15-25 | 0,060 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 |

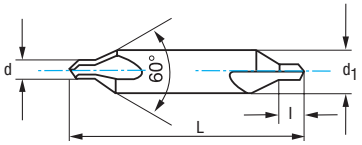
$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = \text{r.p.m.} \times f$$

| d mm | | d1 mm | d2 mm | L mm | l mm | | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **1,00** | x | **4,00** | 2,12 | 35,50 | 1,30 | 1 | 40166 | **9,20** |
| **1,25** | x | **5,00** | 2,65 | 40,00 | 1,60 | 1 | 40172 | **9,20** |
| **1,25** | x | **7,10** | 3,15 | 45,00 | 1,60 | 1 | 40175 | **10,31** |
| **1,60** | x | **6,30** | 3,35 | 45,00 | 2,00 | 1 | 40178 | **9,20** |
| **1,60** | x | **8,00** | 4,00 | 50,00 | 2,00 | 1 | 40181 | **10,31** |
| **2,00** | x | **8,00** | 4,25 | 50,00 | 2,50 | 1 | 40184 | **9,71** |
| **2,00** | x | **10,00** | 5,00 | 56,00 | 2,50 | 1 | 40187 | **12,57** |
| **2,50** | x | **10,00** | 5,30 | 56,00 | 3,10 | 1 | 40190 | **11,39** |
| **2,50** | x | **11,20** | 6,30 | 60,00 | 3,10 | 1 | 40193 | **14,03** |
| **3,15** | x | **11,20** | 6,70 | 60,00 | 3,90 | 1 | 40196 | **14,04** |
| **3,15** | x | **14,00** | 8,00 | 67,00 | 3,90 | 1 | 40199 | **21,06** |
| **4,00** | x | **14,00** | 8,50 | 67,00 | 5,00 | 1 | 40202 | **19,68** |
| **4,00** | x | **16,00** | 10,00 | 80,00 | 5,00 | 1 | 40205 | **30,94** |
| **5,00** | x | **18,00** | 10,60 | 75,00 | 6,30 | 1 | 40208 | **28,78** |
| **5,00** | x | **20,00** | 12,50 | 90,00 | 6,30 | 1 | 40211 | **45,51** |
| **6,30** | x | **20,00** | 13,20 | 80,00 | 8,00 | 1 | 40214 | **42,78** |
| **6,30** | x | **25,00** | 16,00 | 100,00 | 8,00 | 1 | 40217 | **68,87** |

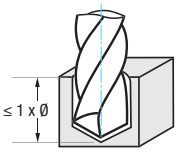


# Ref. 9315

## BROCA CENTRAR DOBLE LARGA
Long Double Center Drill
Foret à centrer double longue



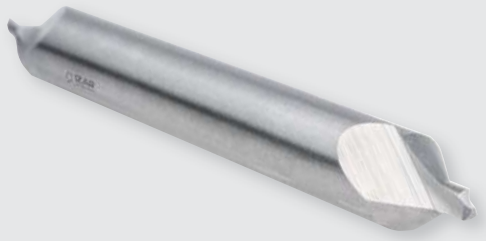

HSSE 5%Co | DIN 333 A | Angular | 118° | **Blanca** Bright Finish Finition blanche | **Rectificado** Ground Taillé meulé




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | |
|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 2 | Ø 3 | Ø 4 | Ø 5 |
| P | P.1 | 20-25 | 0,045 | 0,055 | 0,070 | 0,080 |
| | P.2 | 8-12 | 0,035 | 0,045 | 0,050 | 0,060 |
| K | K.1 | 20-24 | 0,060 | 0,090 | 0,100 | 0,120 |
| | K.2 | 15-20 | 0,050 | 0,070 | 0,080 | 0,100 |
| N | N.1 | 25-30 | 0,050 | 0,070 | 0,080 | 0,100 |
| | N.5 | 15-25 | 0,060 | 0,090 | 0,100 | 0,120 |

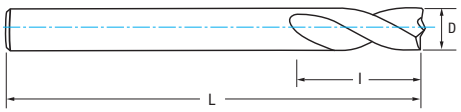
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| d mm | | d1 mm | L mm | l mm | N° Art. 5%Co | € |
|---|---|---|---|---|---|---|
| **1,00** | x | **4,00** | 60 | 1,30 | 74894 | **17,09** |
| **1,00** | x | **4,00** | 120 | 1,30 | 74902 | **42,68** |
| **1,50** | x | **5,00** | 60 | 2,00 | 74895 | **17,42** |
| **1,50** | x | **5,00** | 120 | 2,00 | 74903 | **40,53** |
| **2,00** | x | **6,00** | 80 | 2,50 | 74896 | **18,17** |
| **2,00** | x | **6,00** | 120 | 2,50 | 74904 | **40,53** |
| **2,50** | x | **8,00** | 80 | 3,10 | 74897 | **22,05** |
| **2,50** | x | **8,00** | 120 | 3,10 | 74905 | **46,95** |
| **3,00** | x | **8,00** | 80 | 3,90 | 74898 | **22,05** |
| **3,00** | x | **8,00** | 120 | 3,90 | 74906 | **46,95** |
| **3,00** | x | **10,00** | 100 | 3,90 | 74899 | **28,42** |
| **3,00** | x | **10,00** | 120 | 3,90 | 74907 | **53,31** |
| **4,00** | x | **10,00** | 100 | 5,00 | 74900 | **28,42** |
| **4,00** | x | **10,00** | 120 | 5,00 | 74908 | **53,31** |
| **4,00** | x | **12,00** | 100 | 5,00 | 74901 | **38,36** |
| **4,00** | x | **12,00** | 120 | 5,00 | 74909 | **63,64** |
| **5,00** | x | **14,00** | 120 | 6,30 | 74910 | **76,44** |



# Ref. 1604

## BROCA CORTA PUNTOS SOLDADURA
Welding Point Jobber Drill Bit
Foret courte points soudure




HSSE 5% Co

**Máquina Convencional**
**Conventional Machine**
Machine à colonne

DIN 1412 E

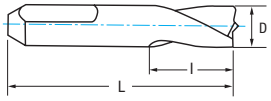
**Blanca**
**Bright Finish**
Finition blanche

| D mm | L mm | l mm | N° Art. 5% Co | € |
|---|---|---|---|---|
| **6,00** | 66 | 28 | 16326 | **10,85** |
| **8,00** | 80 | 37 | 16327 | **13,83** |
| **10,00** | 89 | 43 | 66909 | **17,32** |

**Ref. 1604 recubierta ZIRKONIO**
**bajo demanda** / **upon request** / sur demande

# Ref. 1605

## BROCA EXTRA-CORTA PUNTOS SOLDADURA
Welding Point Stub Drill Bit
Foret extra-courte points soudure




HSSE 8% Co

**Máquina Neumática**
**Pneumatic Machine**
Perceuse à main

DIN 1412 E

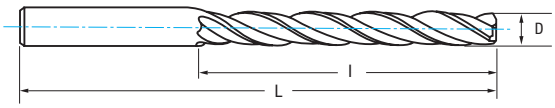
**Blanca**
**Bright Finish**
Finition blanche

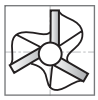
| D mm | L mm | l mm | N° Art. 5% Co | € |
|---|---|---|---|---|
| **8,00** | 38 | 15 | 16328 | **17,26** |
| **8,00** | 45 | 15 | 16329 | **19,24** |
| **10,00** | 45 | 15 | 70687 | **22,90** |

**Ref. 1605 recubierta ZIRKONIO**
**bajo demanda** / **upon request** / sur demande”

# Ref. 2510

**BROCA ESCARIADOR 3 CORTES COMPENSAR ORIFICIOS DESVIADOS. M. CILÍNDRICO**
3 Cut Annular Cutter to Compensate Diverted Holes. Straight Shank
Foret aléseur 3 lèvres pour compenser orifices deviés. Queue cylindrique




HSS | DIN 344 | | 120° |  | **Blanca** **Bright Finish** Finition blanche | Tol. D h8

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 5 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 |
| P | P.1 | 20-25 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 | 0,180 |
| | P.2 | 15-20 | 0,060 | 0,080 | 0,100 | 0,120 | 0,130 | 0,160 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | L mm | l mm | Pre-Escariado Pre-Reaming Pre-Alesage | Pre-Taladrado Pre-Drilling Pre-Perçage | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| **5,00** | 108 | 74 | 4,80 | 3,50 | 3 | 41972 | **28,96** |
| **6,00** | 116 | 80 | 5,80 | 4,20 | 3 | 41975 | **28,96** |
| **7,00** | 133 | 93 | 6,80 | 4,90 | 3 | 41978 | **28,96** |
| **8,00** | 142 | 100 | 7,80 | 5,60 | 3 | 41981 | **30,55** |
| **9,00** | 151 | 107 | 8,80 | 6,30 | 3 | 75024 | **37,19** |
| **10,00** | 162 | 116 | 9,80 | 7,00 | 3 | 41984 | **38,89** |
| **11,00** | 173 | 125 | 10,75 | 7,70 | 3 | 75025 | **42,87** |
| **12,00** | 184 | 134 | 11,75 | 8,40 | 3 | 41987 | **46,02** |
| **13,00** | 184 | 134 | 12,75 | 9,10 | 3 | 80090 | **58,70** |
| **14,00** | 194 | 142 | 13,75 | 9,80 | 3 | 41990 | **62,75** |
| **15,00** | 202 | 147 | 14,75 | 10,50 | 3 | 80227 | **68,46** |
| **16,00** | 211 | 153 | 15,75 | 11,20 | 3 | 41993 | **74,57** |

## PERFORADO CON BROCAS-ESCARIADORES:

**Pueden utilizarse las condiciones de trabajo señaladas en nuestro Catálogo de Brocas para el Empleo de Brocas Helicoidales. En general, deben utilizarse Valores de Velocidad próximos a los Valores Inferiores de dichas Tablas, mientras que en Avances deben ser utilizados los Valores Máximos e incluso superiores, tendiendo a lo que señalamos para el Escariado.**

## DRILLING WITH ANNULAR CUTTER CORE DRILLS:

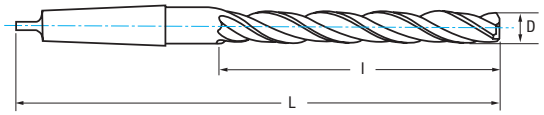
**Could be used Working Conditions for Drill Bits Use, as shown in our Drill Catalogue. As a general Rule, must be used Cutting Figures close to the Inferior ones shown in those Tables, while about Feed must be used Maximum (even Superior) Figures, tending to those ones shown for Reaming.**

## PERÇAGE AVEC FORETS ALÉSEURS:

On peut travailler avec les conditions de coupe indiquées dans notre Catalogue pour l´utilisation de forets. En général, il faut prendre des valeurs de vitesse de coupe proches aux tableaux, tandis que les avances il faut tenir compte les valeurs maximales où mêmes supérieurs, s´approchant aux données de l´alésage.

# Ref. 2610

## BROCA ESCARIADOR 3 CORTES COMPENSAR ORIFICIOS DESVIADOS. M. CÓNICO
3 Cut Annular Cutter to Compensate Diverted Holes. Morse Taper Shank
Foret aléseur 3 lèvres pour compenser orifices deviés. Queue cône morse




HSS | DIN 343 | | 120° | | **Blanca Bright Finish** Finition blanche | Tol. D h8

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x f**

| **Material** | | **Vc (m/min)** | **Avances f/rev. (mm/rev) - Feed** - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Grupo** | **Sub.** | **HSS** | **Ø 5** | **Ø 6** | **Ø 8** | **Ø 10** | **Ø 12** | **Ø 16** | **Ø 20** | **Ø 25** | **Ø 30** | **Ø 40** |
| **P** | **P.1** | 20-25 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 | 0,180 | 0,250 | 0,300 | 0,310 | 0,400 |
| | **P.2** | 15-20 | 0,060 | 0,080 | 0,100 | 0,120 | 0,130 | 0,160 | 0,200 | 0,250 | 0,260 | 0,300 |

| **D mm** | **L mm** | **l mm** | **Pre-Escariado Pre-Reaming** Pre-Alesage | **Pre-Taladrado Pre-Drilling** Pre-Perçage | **CM** | **N° Art. HSS** | **€** |
|---|---|---|---|---|---|---|---|
| **10,00** | 168 | 87 | 9,80 | 7,00 | 1 | 42212 | **58,23** |
| **11,00** | 175 | 94 | 1075 | 7,70 | 1 | 42218 | **60,30** |
| **12,00** | 182 | 101 | 11,75 | 8,40 | 1 | 42224 | **62,40** |
| **13,00** | 182 | 101 | 12,75 | 9,10 | 1 | 42233 | **65,21** |
| **14,00** | 189 | 108 | 13,75 | 9,80 | 1 | 42236 | **69,02** |
| **15,00** | 212 | 114 | 14,75 | 10,50 | 2 | 42239 | **74,22** |
| **16,00** | 218 | 120 | 15,75 | 11,20 | 2 | 42242 | **79,02** |
| **17,00** | 223 | 125 | 16,75 | 11,90 | 2 | 42245 | **86,41** |
| **18,00** | 228 | 130 | 17,75 | 12,60 | 2 | 42248 | **93,64** |
| **19,00** | 233 | 135 | 18,70 | 13,30 | 2 | 42251 | **111,83** |
| **20,00** | 238 | 140 | 19,70 | 14,00 | 2 | 42254 | **112,97** |
| **21,00** | 243 | 145 | 20,70 | 14,60 | 2 | 42257 | **121,26** |
| **22,00** | 248 | 150 | 21,70 | 15,30 | 2 | 42260 | **132,69** |
| **23,00** | 253 | 155 | 22,70 | 16,00 | 2 | 42263 | **142,16** |
| **24,00** | 281 | 160 | 23,70 | 16,60 | 3 | 42266 | **153,00** |
| **25,00** | 281 | 160 | 24,70 | 17,30 | 3 | 42269 | **163,82** |
| **26,00** | 286 | 165 | 25,70 | 18,00 | 3 | 42272 | **180,89** |
| **27,00** | 291 | 170 | 26,70 | 19,30 | 3 | 42275 | **194,94** |
| **28,00** | 291 | 170 | 27,70 | 19,30 | 3 | 42278 | **211,31** |
| **30,00** | 296 | 175 | 29,70 | 20,50 | 3 | 42287 | **245,13** |
| **32,00** | 334 | 185 | 31,60 | 22,00 | 4 | 42293 | **276,36** |
| **34,00** | 339 | 190 | 33,60 | 24,00 | 4 | 42296 | **306,40** |
| **35,00** | 339 | 190 | 34,60 | 25,00 | 4 | 42299 | **332,37** |
| **36,00** | 344 | 195 | 35,60 | 25,50 | 4 | 42302 | **338,53** |
| **38,00** | 349 | 200 | 37,60 | 26,50 | 4 | 42308 | **386,57** |
| **40,00** | 349 | 200 | 39,60 | 28,00 | 4 | 42314 | **425,26** |
| **42,00** | 354 | 205 | 41,60 | 29,00 | 4 | 42317 | **498,80** |

### PERFORADO CON BROCAS-ESCARIADORES:

**Pueden utilizarse las condiciones de trabajo señaladas en nuestro Catálogo de Brocas para el Empleo de Brocas Helicoidales. En general, deben utilizarse Valores de Velocidad próximos a los Valores Inferiores de dichas Tablas, mientras que en Avances deben ser utilizados los Valores Máximos e incluso superiores, tendiendo a lo que señalamos para el Escariado.**

### DRILLING WITH ANNULAR CUTTER CORE DRILLS:

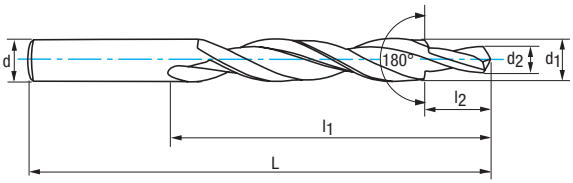
**Could be used Working Conditions for Drill Bits Use, as shown in our Drill Catalogue. As a general Rule, must be used Cutting Figures close to the Inferior ones shown in those Tables, while about Feed must be used Maximum (even Superior) Figures, tending to those ones shown for Reaming.**

### PERÇAGE AVEC FORETS ALÉSEURS:

On peut travailler avec les conditions de coupe indiquées dans notre Catalogue pour l´utilisation de forets. En général, il faut prendre des valeurs de vitesse de coupe proches aux tableaux, tandis que les avances il faut tenir compte les valeurs maximales où mêmes supérieurs, s´approchant aux données de l´alésage.

# Ref. 2536

## BROCA BIDIAMETRAL MANGO CILÍNDRICO
Straight Shank Subland Drill Bit
Foret étagé queue cylindrique




HSS | 180° | DIN 8376

| Blanca Bright Finish Finition blanche | Rectificado Ground Taillé meulé | Tol. d2 h9 | Tol. d1 h8 |
|---|---|---|---|

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | M-3 | M-4 | M-5 | M-6 | M-8 | M-10 |
| P | P.1 | 15-20 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,130 |
| | P.2 | 8-10 | 0,045 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 |
| K | K.1 | 25-30 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 |
| | K.2 | 14-18 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 |
| N | N.1 | 30-35 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 |
| | N.2 | 30-35 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 |
| | N.5 | 20-25 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 |

**Filo Independiente en cada ø para Cabezas de Tornillo Allen DIN-912**

**Independent Edge in each ø for Screw-Heads Allen DIN-912**

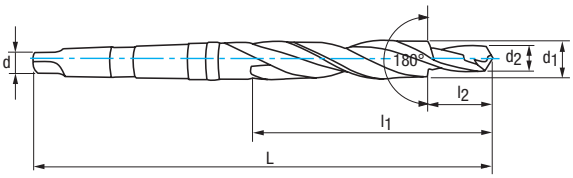
Filet indépendant sur chaque ø pour tête de vis allen DIN 912

| M | d2 mm | d1 mm | L mm | l1 mm | l2 mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| M3 | 3,40 | 6,00 | 93 | 57 | 9 | 42056 | **50,83** |
| M4 | 4,50 | 8,00 | 117 | 75 | 11 | 42059 | **53,27** |
| M5 | 5,50 | 10,00 | 133 | 87 | 13 | 42062 | **63,33** |

| M | d2 mm | d1 mm | L mm | l1 mm | l2 mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| M6 | 6,60 | 11,00 | 142 | 94 | 15 | 42065 | **71,53** |
| M8 | 9,00 | 15,00 | 169 | 114 | 19 | 42068 | **87,88** |
| M10 | 11,00 | 18,00 | 191 | 130 | 23 | 42071 | **174,71** |

# Ref. 2636

## BROCA BIDIAMETRAL MANGO CÓNICO
Morse Taper Shank Subland Drill Bit
Foret étagé queue cône morse




HSS | 180° | DIN 8377

| Blanca Bright Finish Finition blanche | Rectificado Ground Taillé meulé | Tol. d2 h9 | Tol. d1 h8 |
|---|---|---|---|

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | M-8 | M-10 | M-12 | M-14 | M-16 | M-18 | M-20 |
| P | P.1 | 15-20 | 0,120 | 0,130 | 0,160 | 0,170 | 0,180 | 0,200 | 0,250 |
| | P.2 | 8-10 | 0,100 | 0,120 | 0,130 | 0,140 | 0,160 | 0,180 | 0,200 |
| K | K.1 | 25-30 | 0,180 | 0,210 | 0,250 | 0,280 | 0,300 | 0,330 | 0,360 |
| | K.2 | 14-18 | 0,140 | 0,170 | 0,200 | 0,220 | 0,240 | 0,250 | 0,280 |
| N | N.1 | 30-35 | 0,140 | 0,170 | 0,200 | 0,220 | 0,240 | 0,260 | 0,280 |
| | N.2 | 30-35 | 0,180 | 0,210 | 0,250 | 0,280 | 0,300 | 0,330 | 0,360 |
| | N.5 | 20-25 | 0,180 | 0,210 | 0,250 | 0,280 | 0,300 | 0,330 | 0,360 |

**Filo Independiente en cada ø para Cabezas de Tornillo Allen DIN-912**

**Independent Edge in each ø for Screw-Heads Allen DIN-912**

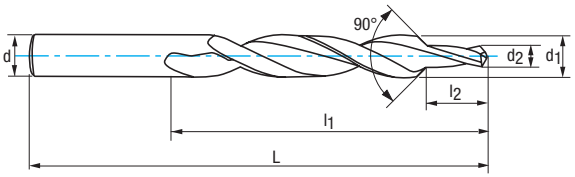
Filet indépendant sur chaque ø pour tête de vis allen DIN 912

| M | d2 mm | d1 mm | L mm | l1 mm | l2 mm | CM | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| M8 | 9,00 | 15,00 | 212 | 114 | 19 | 2 | 42470 | **125,24** |
| M10 | 11,00 | 18,00 | 228 | 130 | 23 | 2 | 42473 | **141,17** |
| M12 | 13,50 | 20,00 | 238 | 140 | 27 | 2 | 42476 | **157,91** |
| M14 | 15,50 | 24,00 | 281 | 160 | 31 | 3 | 42479 | **223,93** |

| M | d2 mm | d1 mm | L mm | l1 mm | l2 mm | CM | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| M16 | 17,50 | 26,00 | 286 | 165 | 35 | 3 | 42482 | **319,30** |
| M18 | 20,00 | 30,00 | 296 | 175 | 39 | 3 | 42485 | **357,04** |
| M20 | 22,00 | 33,00 | 334 | 185 | 43 | 4 | 42488 | **403,73** |

# Ref. 2546

## BROCA BIDIAMETRAL MANGO CILÍNDRICO
Straight Shank Subland Drill Bit
Foret étagé queue cylindrique




HSS | 90° | DIN 8374

| Blanca Bright Finish Finition blanche | Rectificado Ground Taillé meulé | Tol. d2 h9 | Tol. d1 h8 |
|---|---|---|---|

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

| Material Grupo | Material Sub. | Vc (m/min) HSS | Avances f/rev. (mm/rev) - Feed - Pas M-3 | M-4 | M-5 | M-6 | M-8 | M-10 |
|---|---|---|---|---|---|---|---|---|
| P | P.1 | 15-20 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,130 |
| | P.2 | 8-10 | 0,045 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 |
| K | K.1 | 25-30 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 |
| | K.2 | 14-18 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 |
| N | N.1 | 30-35 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 |
| | N.2 | 30-35 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 |
| | N.5 | 20-25 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 |

**Broca-Avellanador con Filos Independientes para Asientos Cónicos a 90° DIN 74/A**

**Independent Edge Countersink-Drill for 90° Spot Holes DIN 74/A**

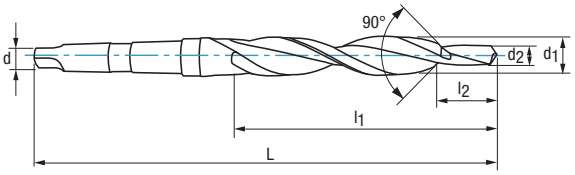
Foret-Fraise à ébavurer avec filets indépendants coniques à 90° DIN 74/A

| M | d2 mm | d1 mm | L mm | l1 mm | l2 mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| M3 | 3,20 | 6,00 | 93 | 57 | 9 | 42101 | **59,28** |
| M4 | 4,30 | 8,00 | 117 | 75 | 11 | 42104 | **62,16** |
| M5 | 5,30 | 10,00 | 133 | 87 | 13 | 42107 | **73,88** |

| M | d2 mm | d1 mm | L mm | l1 mm | l2 mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| M6 | 6,40 | 11,50 | 142 | 94 | 15 | 42110 | **84,40** |
| M8 | 8,40 | 15,00 | 169 | 114 | 19 | 42113 | **115,44** |
| M10 | 10,50 | 19,00 | 198 | 135 | 23 | 42116 | **178,24** |

# Ref. 2646

## BROCA BIDIAMETRAL MANGO CÓNICO
Morse Taper Shank Subland Drill Bit
Foret étagé queue cône morse




HSS | 90° | DIN 8375

| Blanca Bright Finish Finition blanche | Rectificado Ground Taillé meulé | Tol. d2 h9 | Tol. d1 h8 |
|---|---|---|---|

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

| Material Grupo | Material Sub. | Vc (m/min) HSS | Avances f/rev. (mm/rev) - Feed - Pas M-5 | M-6 | M-8 | M-10 |
|---|---|---|---|---|---|---|
| P | P.1 | 15-20 | 0,080 | 0,100 | 0,120 | 0,130 |
| | P.2 | 8-10 | 0,060 | 0,080 | 0,100 | 0,120 |
| K | K.1 | 25-30 | 0,120 | 0,150 | 0,180 | 0,210 |
| | K.2 | 14-18 | 0,100 | 0,120 | 0,140 | 0,170 |
| N | N.1 | 30-35 | 0,100 | 0,120 | 0,140 | 0,170 |
| | N.2 | 30-35 | 0,120 | 0,150 | 0,180 | 0,210 |
| | N.5 | 20-25 | 0,120 | 0,150 | 0,180 | 0,210 |

**Broca-Avellanador con Filos Independientes para Asientos Cónicos a 90° DIN 74/A**

**Independent Edge Countersink-Drill for 90° Spot Holes DIN 74/A**

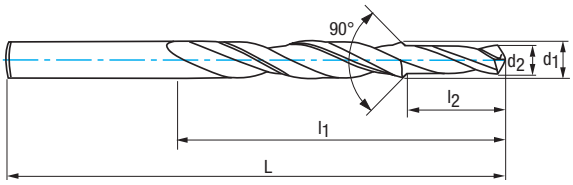
Foret-Fraise à ébavurer avec filets indépendants coniques à 90° DIN 74/A

| M | d2 mm | d1 mm | L mm | l1 mm | l2 mm | CM | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| M5 | 5,50 | 11,00 | 175 | 94 | 13 | 1 | 42530 | **121,09** |
| M6 | 6,60 | 13,00 | 182 | 101 | 15 | 1 | 42533 | **123,56** |

| M | d2 mm | d1 mm | L mm | l1 mm | l2 mm | CM | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| M8 | 9,00 | 17,20 | 228 | 130 | 19 | 2 | 42536 | **147,26** |
| M10 | 11,00 | 21,50 | 248 | 150 | 23 | 2 | 42539 | **174,36** |

# Ref. 2544

## BROCA BIDIAMETRAL MANGO CILÍNDRICO
Straight Shank Subland Drill Bit
Foret étagé queue cylindrique




HSS | 90° | DIN 8378

| Blanca Bright Finish Finition blanche | Rectificado Ground Taillé meulé | Tol. d2 h9 | Tol. d1 h8 |
|---|---|---|---|

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

| Material Grupo | Sub. | Vc (m/min) HSS | Avances f/rev. (mm/rev) - Feed - Pas M-3 | M-4 | M-5 | M-6 | M-8 | M-10 | M-12 |
|---|---|---|---|---|---|---|---|---|---|
| P | P.1 | 15-20 | 0,055 | 0,070 | 0,080 | 0,100 | 0,120 | 0,130 | 0,160 |
| | P.2 | 8-10 | 0,045 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 | 0,130 |
| K | K.1 | 25-30 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 |
| | K.2 | 14-18 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 |
| N | N.1 | 30-35 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,170 | 0,200 |
| | N.2 | 30-35 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 |
| | N.5 | 20-25 | 0,090 | 0,100 | 0,120 | 0,150 | 0,180 | 0,210 | 0,250 |

**Broca-Avellanador con Filos Independientes para preparar Agujero Previo Roscado y Avellanado 90°**

**Independent Edge Countersink-Drill for 90° Drilling & Counterboring Previous Hole Preparation**

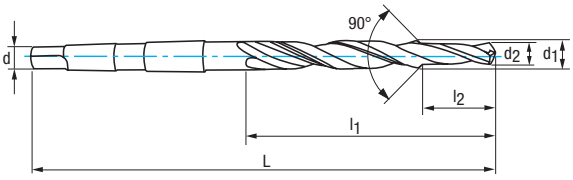
Foret-Fraise à ébavurer avec filets indépendants coniques à 90° pour preparer des avant-trous

| M | d2 mm | d1 mm | L mm | l1 mm | l2 mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| M3 | 2,50 | 3,40 | 70 | 39 | 8,80 | 42080 | **45,59** |
| M4 | 3,30 | 4,50 | 80 | 47 | 11,40 | 42083 | **49,02** |
| M5 | 4,20 | 5,50 | 93 | 57 | 13,60 | 42086 | **52,81** |
| M6 | 5,00 | 6,60 | 101 | 63 | 16,50 | 42089 | **60,08** |

| M | d2 mm | d1 mm | L mm | l1 mm | l2 mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| M8 | 6,80 | 9,00 | 125 | 81 | 21,00 | 42092 | **71,57** |
| M10 | 8,50 | 11,00 | 142 | 94 | 25,50 | 42095 | **83,51** |
| M12 | 10,20 | 13,50 | 160 | 108 | 30,00 | 42098 | **103,97** |

# Ref. 2644

## BROCA BIDIAMETRAL MANGO CÓNICO
Morse Taper Shank Subland Drill Bit
Foret étagé queue cône morse




HSS | 90° | DIN 8379

| Blanca Bright Finish Finition blanche | Rectificado Ground Taillé meulé | Tol. d2 h9 | Tol. d1 h8 |
|---|---|---|---|

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

| Material Grupo | Sub. | Vc (m/min) HSS | Avances f/rev. (mm/rev) - Feed - Pas M-8 | M-10 | M-12 | M-14 | M-16 | M-18 | M-20 |
|---|---|---|---|---|---|---|---|---|---|
| P | P.1 | 15-20 | 0,120 | 0,130 | 0,160 | 0,170 | 0,180 | 0,200 | 0,250 |
| | P.2 | 8-10 | 0,100 | 0,120 | 0,130 | 0,140 | 0,160 | 0,180 | 0,200 |
| K | K.1 | 25-30 | 0,180 | 0,210 | 0,250 | 0,280 | 0,300 | 0,330 | 0,360 |
| | K.2 | 14-18 | 0,140 | 0,170 | 0,200 | 0,220 | 0,240 | 0,250 | 0,280 |
| N | N.1 | 30-35 | 0,140 | 0,170 | 0,200 | 0,220 | 0,240 | 0,260 | 0,280 |
| | N.2 | 30-35 | 0,180 | 0,210 | 0,250 | 0,280 | 0,300 | 0,330 | 0,360 |
| | N.5 | 20-25 | 0,180 | 0,210 | 0,250 | 0,280 | 0,300 | 0,330 | 0,360 |

**Broca-Avellanador con Filos Independientes para preparar Agujero Previo Roscado y Avellanado 90°**

**Independent Edge Countersink-Drill for 90° Drilling & Counterboring Previous Hole Preparation**

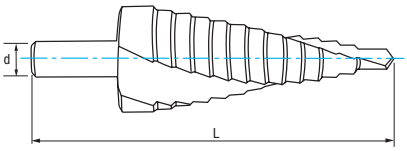
Foret-Fraise à ébavurer avec filets indépendants coniques à 90° pour preparer des avant-trous

| M | d2 mm | d1 mm | L mm | l1 mm | l2 mm | CM | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| M8 | 6,80 | 9,00 | 162 | 81 | 21,00 | 1 | 42509 | **111,13** |
| M10 | 8,50 | 11,00 | 175 | 94 | 25,50 | 1 | 42512 | **121,07** |
| M12 | 10,20 | 13,50 | 189 | 108 | 30,00 | 1 | 42515 | **143,04** |
| M14 | 12,00 | 15,50 | 218 | 120 | 34,50 | 2 | 42518 | **152,62** |

| M | d2 mm | d1 mm | L mm | l1 mm | l2 mm | CM | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| M16 | 14,00 | 17,50 | 228 | 130 | 38,50 | 2 | 42521 | **164,72** |
| M18 | 15,50 | 20,00 | 238 | 140 | 43,50 | 2 | 42524 | **184,19** |
| M20 | 17,50 | 22,00 | 248 | 150 | 47,50 | 2 | 42527 | **222,75** |

# Ref. 1617

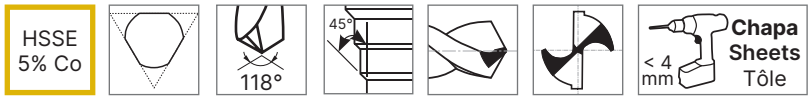
## BROCA ESCALONADA ESPIRAL HSSE INOX
## Stainless HSSE Spiral Step Drill Bit
## Foret étagé spirale HSSE Inox




- **Canal optimizado para virutas largas y complejas**
- **Avellanado especial 45°**
- **Filos de corte protegidos y muy afilados**
- **Sin rebabas**
- **Mayor vida útil en materiales muy duros**
- **Autocentrado en chapas finas**

- **Optimized channel for long and complex chips**
- **Special 45º Countersinking**
- **Very sharpened & protected cutting edges**
- **No burrs**
- **Longer tool life in very hard materials**
- **Autocentering in fine sheets**

- Goujure optimisée pour copeaux longs et complexes
- Ébavurage special à 45º
- Filets des arêtes de coupe protégés et plus affûtés
- Sans bavures
- Vie utile plus longue pour aciers plus durs
- Autocentrage sur toles minces




| | | |
|---|---|---|
| **P** | **P.1 P.5** | **Aceros** Steels Aciers |
| **M** | | **INOX** Stainless Steel Acier INOX |
| **N** | | **Cobre** / **Copper** / Cuivre **Aluminio** / **Aluminium** **Plásticos** / **Plastics** / Plastiques |

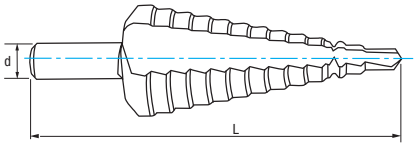
| Cap. mm | Nº Pasos* Steps* / Étages* | d mm | L mm | Nº Art. 5%Co | € |
|---|---|---|---|---|---|
| **4-12** | **9** (4-5-6-7-8-9-10-11-12) | 6 | 80 | 67314 | **50,73** |
| **4-20** | **9** (4-6-8-10-12-14-16-18-20) | 9 | 69 | 67316 | **71,98** |
| **6-30** | **13** (6-8-10-12-14-16-18-20-22-24-26-28-30) | 10 | 99 | 67318 | **104,64** |

### Set 3 Pcs

| Cont. | Nº Art. 5%Co | € |
|---|---|---|
| **4-12, 4-20, 6-30 mm** | 67317 | **227,35** |

# Ref. 1607

## BROCA ESCALONADA HSSE INOX
## Stainless HSSE Step Drill Bit
## Foret étagé HSSE Inox




- **Nueva punta robusta autocentrante**
- **Avellanado especial 45º**
- **Menor desgaste y esfuerzo de corte**
- **Mayor rendimiento y vida útil de la herramienta**
- **Mejor evacuación de viruta**
- **Acabado sin rebabas**

- **New autocentering robust point**
- **Special 45º Countersinking**
- **Lower wear and cutting effort**
- **Better performance & longer tool life**
- **Better chipping-off**
- **No-burr finishing**

- Nouvelle pointe plus robuste autocentrante
- Ébavurage special à 45º
- Réduction de l´usure et de l´éffort de coupe
- Augmentation de la performance et vie utile de l´outil
- Meilleure évacuation des copeaux
- Finition sans bavures

HSSE 5% Co | IZAR Std. | 118° | 45° | < 4 mm | **Chapa Sheets** Tôle

| | | |
|---|---|---|
| **P** | **P.1 P.5** | **Aceros Steels** Aciers |
| **M** | | **INOX Stainless Steel** Acier INOX |
| **N** | | **Cobre / Copper** / Cuivre **Aluminio / Aluminium Plásticos / Plastics** / Plastiques |

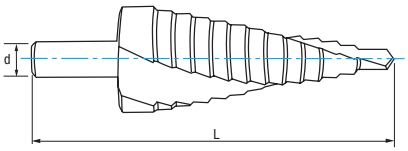
| Cap. mm | Nº Pasos Steps / Étages | d mm | L mm | Nº Art. 5%Co | € |
|---|---|---|---|---|---|
| **4-12** | **9** (4-5-6-7-8-9-10-11-12) | 6 | 79 | 12072 | **48,72** |
| **4-20** | **9** (4-6-8-10-12-14-16-18-20) | 8 | 67 | 12078 | **61,97** |
| **6-30** | **13** (6-8-10-12-14-16-18-20-22-24-26-28-30) | 10 | 100 | 12084 | **91,06** |
| **9-36** | **10** (9-12-15-18-21-24-27-30-33-36) | 12 | 82 | 67299 | **163,82** |
| **12-20** | **9** (12-13-14-15-16-17-18-19-20) | 9 | 75 | 60835 | **67,58** |
| **20-30** | **11** (20-21-22-23-24-25-26-27-28-29-30) | 12 | 88 | 60837 | **98,50** |
| **30-40** | **11** (30-31-32-33-34-35-36-37-38-39-40) | 13 | 98 | 60838 | **154,03** |
| **40-50** | **11** (40-41-42-43-44-45-46-47-48-49-50) | 13 | 112 | 60839 | **229,19** |
| **50-60** | **11** (50-51-52-53-54-55-56-57-58-59-60) | 13 | 120 | 60840 | **342,92** |

### Set 3 Pcs

| Cont. | Nº Art. 5%Co | € |
|---|---|---|
| **4-12, 4-20, 6-30 mm** | 43519 | **201,75** |

# Ref. 1612

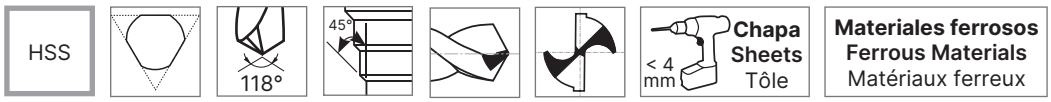
## BROCA ESCALONADA ESPIRAL HSS
## HSS Spiral Step Drill Bit
## Foret étagé spirale HSS




- **Canal optimizado para virutas largas y complejas**
- **Avellanado especial 45°**
- **Filos de corte protegidos y muy afilados**
- **Sin rebabas**
- **Mayor vida útil en materiales muy duros**
- **Autocentrado en chapas finas**

- **Optimized channel for long and complex chips**
- **Special 45° Countersinking**
- **Very sharpened & protected cutting edges**
- **No burrs**
- **Longer tool life in very hard materials**
- **Autocentering in fine sheets**

- Goujure optimisée pour copeaux longs et complexes
- Ébavurage special à 45°
- Filets des arêtes de coupe protégés et plus affûtés
- Sans bavures
- Vie utile plus longue pour aciers plus durs
- Autocentrage sur toles minces




| | | | | | |
|---|---|---|---|---|---|
| **P** | **P.1** | **Aceros Steels** Aciers | **N** | **N.6 N.7** | **Plásticos Plastics** Plastiques |

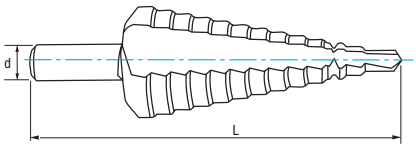
| Cap. mm | Nº Pasos Steps / Étages | d mm | L mm | Nº Art. HSS | € |
|---|---|---|---|---|---|
| **4-12** | **9** (4-5-6-7-8-9-10-11-12) | 6 | 80 | 67360 | **42,26** |
| **4-20** | **9** (4-6-8-10-12-14-16-18-20) | 9 | 69 | 67366 | **59,97** |
| **6-30** | **13** (6-8-10-12-14-16-18-20-22-24-26-28-30) | 10 | 99 | 67368 | **87,22** |
| **6-38** | **12** (6-9-13-16-19-21-23-26-29-32-35-38) | 12 | 97 | 69557 | **171,53** |

### Set 3 Pcs

| Cont. | Nº Art. HSS | € |
|---|---|---|
| **4-12, 4-20, 6-30 mm** | 67357 | **189,45** |

# Ref. 1602

## BROCA ESCALONADA HSS
HSS Step Drill
Foret étagé HSS




- **Nueva punta robusta autocentrante**
- **Avellanado especial 45°**
- **Menor desgaste y esfuerzo de corte**
- **Mayor rendimiento y vida útil de la herramienta**
- **Mejor evacuación de viruta**
- **Acabado sin rebabas**

- **New autocentering robust point**
- **Special 45° Countersinking**
- **Lower wear and cutting effort**
- **Better performance & longer tool life**
- **Better chipping-off**
- **No-burr finishing**

- Nouvelle pointe plus robuste autocentrante
- Ébavurage special à 45°
- Réduction de l´usure et de l´éffort de coupe
- Augmentation de la performance et vie utile de l´outil
- Meilleure évacuation des copeaux
- Finition sans bavures

HSS | IZAR Std. | 118° | 45° | < 4 mm | **Chapa Sheets** Tôle | **Materiales ferrosos Ferrous Materials** Matériaux ferreux

**P** **P.1** **Aceros Steels** Aciers

**N** **N.6 N.7** **Plásticos Plastics** Plastiques

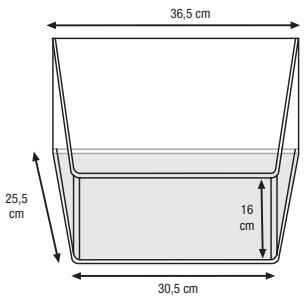
| Cap. mm | Nº Pasos Steps / Étages | d mm | L mm | Nº Art. HSS | € |
|---|---|---|---|---|---|
| **4-12** | **9** (4-5-6-7-8-9-10-11-12) | 6 | 79 | 12048 | **40,61** |
| **4-20** | **9** (4-6-8-10-12-14-16-18-20) | 9 | 67 | 12054 | **51,63** |
| **4-30** | **14** (4-6-8-10-12-14-16-18-20-22-24-26-28-30) | 10 | 100 | 66484 | **68,30** |
| **6-30** | **13** (6-8-10-12-14-16-18-20-22-24-26-28-30) | 10 | 100 | 12060 | **75,89** |
| **7-37** | **8** (7-12,5-15,2-18,6-20,4-22,5-28,3-37) | 12 | 90 | 67619 | **148,04** |
| **9-36** | **10** (9-12-15-18-21-24-27-30-33-36) | 12 | 82 | 12066 | **136,52** |
| **12-20** | **9** (12-13-14-15-16-17-18-19-20) | 9 | 75 | 56798 | **56,31** |
| **20-30** | **11** (20-21-22-23-24-25-26-27-28-29-30) | 12 | 88 | 56799 | **82,09** |
| **30-40** | **11** (30-31-32-33-34-35-36-37-38-39-40) | 13 | 98 | 60715 | **123,23** |
| **40-50** | **11** (40-41-42-43-44-45-46-47-48-49-50) | 13 | 112 | 60716 | **190,99** |
| **50-60** | **11** (50-51-52-53-54-55-56-57-58-59-60) | 13 | 120 | 60717 | **285,77** |

### Set 3 Pcs

| Cont. | Nº Art. HSS | € |
|---|---|---|
| **4-12, 4-20, 6-30 mm** | 43518 | **168,13** |

# Expo 1602

## EXPOSITOR BROCAS ESCALONADAS
Step Drill Display
Présentoirs forets étagés



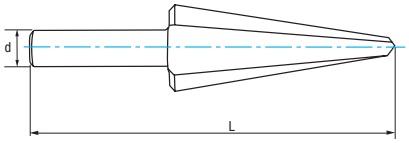

### 15 Pcs

| Nº Art. | € |
|---|---|
| 65184 | **1.486,09** |

| Cap. mm | Nº Art. HSS | Uds. |
|---|---|---|
| **4-12** | 12048 | 2 |
| **4-20** | 12054 | 2 |
| **6-30** | 12060 | 2 |
| **9-36** | 12066 | 2 |
| **12-20** | 56798 | 2 |
| **20-30** | 56799 | 2 |
| **30-40** | 60715 | 1 |
| **40-50** | 60716 | 1 |
| **50-60** | 60717 | 1 |

# Ref. 1609

## BROCA TUBO/CHAPA HSSE
HSSE Tube-Sheet Drill
Foret ampli-trou HSSE




- **Nueva geometría**
- **Menor desgaste, mayor vida útil de la herramienta**
- **Mayor velocidad de corte**
- **Materia prima de última generación**

- **New geometry**
- **Lower wear and longer tool life**
- **Higher cutting speed**
- **Last generation raw material**

- Nouvelle Géométrie
- Réduction de l´usure, vie plus longue de l´outil
- Augmentation de la vitesse de coupe
- Matière Première dernière génération

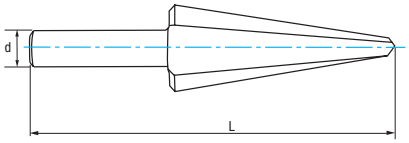
HSSE 5% Co | IZAR Std. | 100° | 20-30° | < 4 mm **Chapa Sheets** Tôle | Blue Finish

**P** **P.1 P.5** **Aceros Steels** Aciers | **M** **INOX Stainless Steel** Acier INOX | **N** **N.6 N.7** **Plásticos Plastics** Plastiques

| Cap. mm | d mm | L mm | N° Art. 5% Co | € |
|---|---|---|---|---|
| **3-14** | 6 | 60 | 12108 | **31,11** |
| **4-30,5** | 10 | 102 | 69926 | **104,62** |
| **8-20** | 8 | 62 | 69925 | **41,20** |
| **16-30,5** | 10 | 72 | 12111 | **68,00** |

# Ref. 1603

## BROCA TUBO/CHAPA
Tube-Sheet Drill Bit
Foret ampli-trou




- **Nueva geometría**
- **Menor desgaste, mayor vida útil de la herramienta**
- **Mayor velocidad de corte**
- **Materia prima de última generación**

- **New geometry**
- **Lower wear and longer tool life**
- **Higher cutting speed**
- **Last generation raw material**

- Nouvelle Géométrie
- Réduction de l´usure, vie plus longue de l´outil
- Augmentation de la vitesse de coupe
- Matière Première dernière génération

HSS | 100° | 20-30° | < 4 mm **Chapa Sheets** Tôle | **Metal no ferroso Non-ferrous Metal** Métal non ferreux

**P** **P.1** **Aceros Steels** Aciers | **N** **N.6 N.7** **Plásticos Plastics** Plastiques

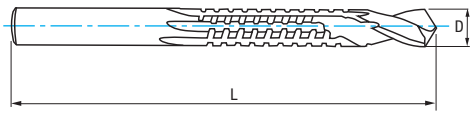
| Cap. mm | d mm | L mm | N° Art. HSS | € |
|---|---|---|---|---|
| **3-14** | 6 | 60 | 12090 | **16,01** |
| **4-25,4** | 10 | 90 | 69921 | **42,98** |
| **5-20** | 8 | 66 | 69920 | **26,60** |
| **8-20** | 8 | 62 | 69924 | **23,00** |
| **16-30,5** | 10 | 72 | 12096 | **43,93** |

| Cap. mm | d mm | L mm | N° Art. HSS | € |
|---|---|---|---|---|
| **26-40** | 12 | 85 | 69922 | **90,91** |
| **36-50** | 12 | 97 | 12100 | **132,62** |
| **40-61*** | 13 | 103 | 12102 | **221,28** |
| **46-60** | 13 | 96 | 69923 | **221,28** |

*** Cap. hasta fin de existencias** / **while stock lasts** / jusqu`à la fin de stock

# Ref. 1606

**BROCA FRESA**
Milling Drill
Foret à découper la tôle

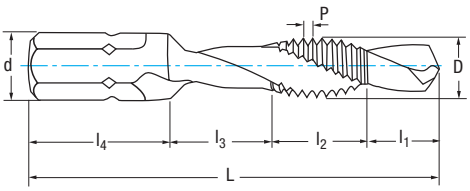



| HSS | IZAR Std. | 135° | | **Blanca Bright Finish** Finition blanche |
|---|---|---|---|---|

| D mm | L mm | N° Art. HSS | € |
|---|---|---|---|
| **6,00** | 90 | 16330 | **13,70** |
| **8,00** | 95 | 16331 | **17,51** |

# Ref. 1610

**BROCA-MACHO-AVELLANADOR**
Combi Tap With Countersink
Outil multi-fonction




| HSS | DIN 3126 | | **Mango** HEX 1/4 **Shank** / Queue | Multi-Función | **Blanca Bright Finish** Finition blanche |
|---|---|---|---|---|---|

| D mm | L mm | l1 mm | l2 mm | l3 mm | l4 mm | d mm | P | Avellanado Countersinking Fraisage mm | | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **M3** | 36 | 5 | 8 | 7 | 12 | 6,35 | 0,50 | 7,00 | 1 | 12567 | **17,15** |
| **M4** | 39 | 5 | 11 | 8 | 12 | 6,35 | 0,70 | 7,00 | 1 | 12571 | **17,15** |
| **M5** | 41 | 7 | 11 | 9 | 12 | 6,35 | 0,80 | 7,00 | 1 | 12577 | **19,23** |
| **M6** | 44 | 8 | 11 | 10 | 12 | 6,35 | 1,00 | 7,00 | 1 | 10971 | **19,84** |
| **M8** | 50 | 11 | 15 | 10 | 12 | 6,35 | 1,25 | 9,00 | 1 | 12582 | **27,42** |
| **M10** | 59 | 12 | 21 | 10 | 12 | 6,35 | 1,50 | 11,00 | 1 | 12583 | **33,08** |

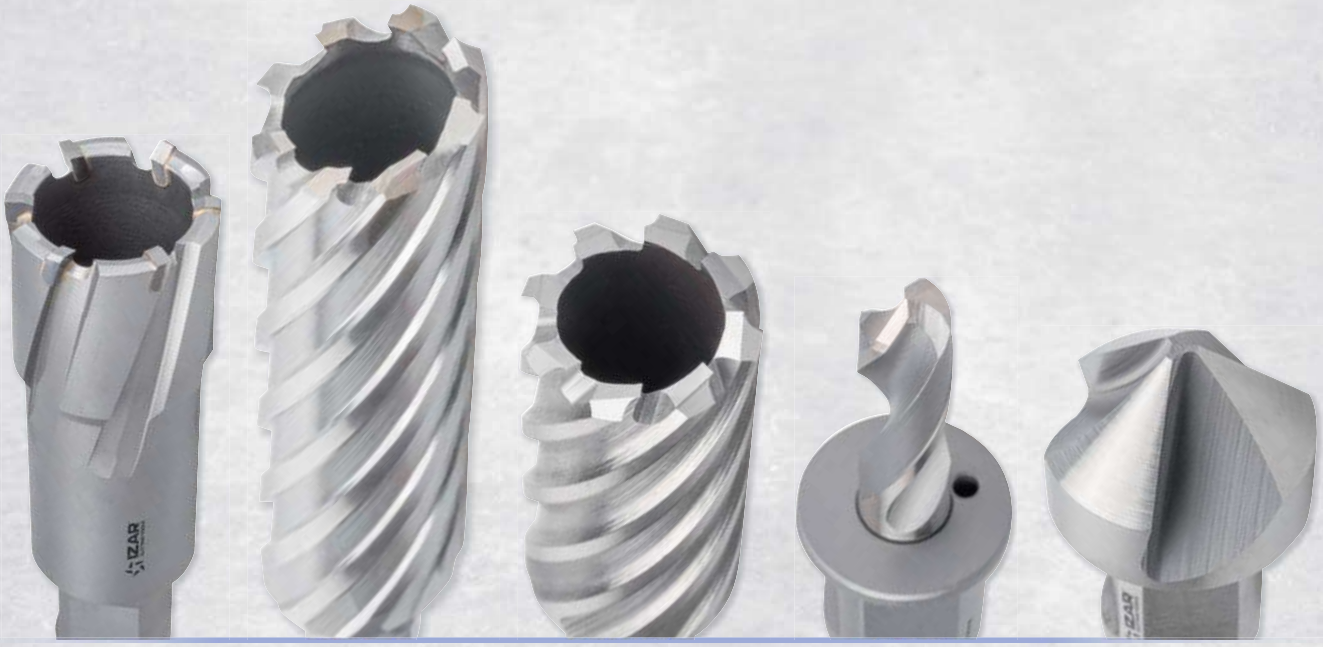
## Set 7 Pcs

| Cont. Ø | N° Art. HSS | € |
|---|---|---|
| **M3-M4-M5-M6-M8-M10-Adapt.** | 11025 | **133,87** |

# FRESAS HUECAS M. ELECTROMAGNÉTICAS

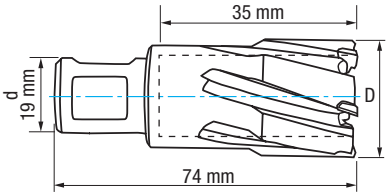
## Annular Cutter Core Drills

## Fraises à carotter UP électromagnétiques



# Ref. 4078

## FRESA HUECA MÁQUINAS ELECTROMAGNÉTICAS TCT CORTA
Short TCT Annular Cutter Core Drill
Fraise à carotter pour unité de perçage électromagnétique TCT courte




MD/HM TCT

**Serie Corta**
Short Length
Série courte

**Apto con Poca Lubricación**
**Suitable with Minimal Cooling**
Apte avec lubrification minimale

**Apto para Madera**
**Suitable for Wood**
Adapté au bois

DOBLE WELDON

| Material | | RPM | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | Ø 12 | Ø 14 | Ø 16 | Ø 18 | Ø 20 | Ø 25 | Ø 30 | Ø 40 | Ø 50 | Ø 60 |
| P | P.1 | 981 | 841 | 736 | 654 | 588 | 471 | 392 | 294 | 235 | 196 |
| | P.2 | 928 | 795 | 696 | 618 | 557 | 445 | 371 | 278 | 222 | 185 |
| | P.3 | 795 | 682 | 596 | 530 | 477 | 381 | 318 | 238 | 190 | 159 |
| | P.4 | 477 | 409 | 358 | 318 | 286 | 229 | 191 | 143 | 114 | 95 |
| M | | 530 | 454 | 397 | 353 | 318 | 254 | 212 | 159 | 127 | 106 |
| K | K.1 | 1591 | 1364 | 1193 | 1061 | 954 | 763 | 636 | 477 | 381 | 318 |
| N | N.1 | 928 | 795 | 696 | 618 | 557 | 445 | 371 | 278 | 222 | 185 |
| | N.2 | 928 | 795 | 696 | 618 | 557 | 445 | 371 | 278 | 222 | 185 |
| | N.3 | 2387 | 2046 | 1790 | 1591 | 1432 | 1145 | 954 | 716 | 572 | 477 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | d mm | L mm | l mm | N° Art. TCT | € |
|---|---|---|---|---|---|
| **14** | 19 | 74 | 35 | 61963 | **42,26** |
| **15** | 19 | 74 | 35 | 61964 | **42,26** |
| **16** | 19 | 74 | 35 | 61965 | **42,26** |
| **17** | 19 | 74 | 35 | 61966 | **42,26** |
| **18** | 19 | 74 | 35 | 61967 | **42,26** |
| **19** | 19 | 74 | 35 | 61968 | **42,26** |
| **20** | 19 | 74 | 35 | 61969 | **42,26** |
| **21** | 19 | 74 | 35 | 61970 | **42,33** |
| **22** | 19 | 74 | 35 | 61971 | **42,33** |
| **23** | 19 | 74 | 35 | 61973 | **42,60** |
| **24** | 19 | 74 | 35 | 61974 | **43,05** |
| **25** | 19 | 74 | 35 | 61975 | **43,22** |
| **26** | 19 | 74 | 35 | 61976 | **50,06** |
| **27** | 19 | 74 | 35 | 61977 | **50,06** |
| **28** | 19 | 74 | 35 | 61978 | **50,06** |
| **29** | 19 | 74 | 35 | 61979 | **50,06** |

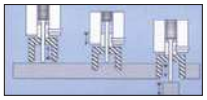
| D mm | d mm | L mm | l mm | N° Art. TCT | € |
|---|---|---|---|---|---|
| **30** | 19 | 74 | 35 | 61980 | **50,06** |
| **31** | 19 | 74 | 35 | 61981 | **62,23** |
| **32** | 19 | 74 | 35 | 61982 | **63,87** |
| **33** | 19 | 74 | 35 | 61983 | **64,27** |
| **34** | 19 | 74 | 35 | 61984 | **72,40** |
| **35** | 19 | 74 | 35 | 61985 | **79,43** |
| **36** | 19 | 74 | 35 | 61986 | **79,43** |
| **37** | 19 | 74 | 35 | 61987 | **79,43** |
| **38** | 19 | 74 | 35 | 61988 | **79,43** |
| **39** | 19 | 74 | 35 | 61989 | **79,43** |
| **40** | 19 | 74 | 35 | 61990 | **79,43** |
| **41** | 19 | 74 | 35 | 61991 | **92,10** |
| **42** | 19 | 74 | 35 | 61992 | **96,95** |
| **43** | 19 | 74 | 35 | 61993 | **98,85** |
| **44** | 19 | 74 | 35 | 61994 | **98,88** |
| **45** | 19 | 74 | 35 | 61995 | **98,88** |

| D mm | d mm | L mm | l mm | N° Art. TCT | € |
|---|---|---|---|---|---|
| **46** | 19 | 74 | 35 | 61996 | **113,94** |
| **47** | 19 | 74 | 35 | 61997 | **113,94** |
| **48** | 19 | 74 | 35 | 61998 | **113,94** |
| **49** | 19 | 74 | 35 | 61999 | **114,14** |
| **50** | 19 | 74 | 35 | 62000 | **118,31** |
| **51** | 19 | 74 | 35 | 62001 | **123,94** |
| **52** | 19 | 74 | 35 | 62002 | **123,94** |
| **53** | 19 | 74 | 35 | 62003 | **123,94** |
| **54** | 19 | 74 | 35 | 62004 | **123,94** |
| **55** | 19 | 74 | 35 | 62005 | **124,45** |
| **56** | 19 | 74 | 35 | 62006 | **135,12** |
| **57** | 19 | 74 | 35 | 62007 | **135,12** |
| **58** | 19 | 74 | 35 | 62008 | **135,12** |
| **59** | 19 | 74 | 35 | 62009 | **143,22** |
| **60** | 19 | 74 | 35 | 62010 | **150,42** |

# Ref. 4075

## EXPULSORES
Pilot Pins
Ejecteurs

HSS

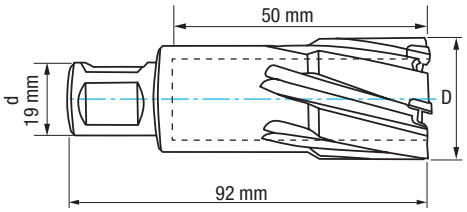


| D mm | L mm | Cap. mm | Para/For/Pour Ref. | N° Art. HSS | € |
|---|---|---|---|---|---|
| **6,34** | 90 | 12-17 | 4078 (35 mm) | 65905 | **17,39** |
| ***6,34** | 116 | 12-17 | 4078 (35 mm) | 71750 | **23,73** |
| **7,98** | 90 | 18-60 | 4078 (35 mm) | 65907 | **22,60** |
| ***7,98** | 118 | 18-60 | 4078 (35 mm) | 71880 | **28,48** |

* **Para uso con adaptador**
**When using with adapter** / Pour usage avec adaptateur

# Ref. 4077

## FRESA HUECA MÁQUINAS ELECTROMAGNÉTICAS TCT LARGA
Long TCT Annular Cutter Core Drill
Fraise à carotter pour unité de perçage électromagnétique TCT longue




MD/HM TCT

**Serie Larga**
Long Length
Série longue

**Apto con Poca Lubricación**
**Suitable with Minimal Cooling**
Apte avec lubrification minimale

**Apto para Madera**
**Suitable for Wood**
Adapté au bois

DOBLE WELDON

| Material | | RPM | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | Ø 12 | Ø 14 | Ø 16 | Ø 18 | Ø 20 | Ø 25 | Ø 30 | Ø 40 | Ø 50 | Ø 60 |
| P | P.1 | 981 | 841 | 736 | 654 | 588 | 471 | 392 | 294 | 235 | 196 |
| | P.2 | 928 | 795 | 696 | 618 | 557 | 445 | 371 | 278 | 222 | 185 |
| | P.3 | 795 | 682 | 596 | 530 | 477 | 381 | 318 | 238 | 190 | 159 |
| | P.4 | 477 | 409 | 358 | 318 | 286 | 229 | 191 | 143 | 114 | 95 |
| M | | 530 | 454 | 397 | 353 | 318 | 254 | 212 | 159 | 127 | 106 |
| K | K.1 | 1591 | 1364 | 1193 | 1061 | 954 | 763 | 636 | 477 | 381 | 318 |
| N | N.1 | 928 | 795 | 696 | 618 | 557 | 445 | 371 | 278 | 222 | 185 |
| | N.2 | 928 | 795 | 696 | 618 | 557 | 445 | 371 | 278 | 222 | 185 |
| | N.3 | 2387 | 2046 | 1790 | 1591 | 1432 | 1145 | 954 | 716 | 572 | 477 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = \text{r.p.m.} \times f$$

| D mm | d mm | L mm | l mm | N° Art. TCT | € |
|---|---|---|---|---|---|
| **14** | 19 | 92 | 50 | 56746 | **60,24** |
| **15** | 19 | 92 | 50 | 56747 | **60,24** |
| **16** | 19 | 92 | 50 | 56749 | **60,24** |
| **17** | 19 | 92 | 50 | 56750 | **60,24** |
| **18** | 19 | 92 | 50 | 56752 | **60,24** |
| **19** | 19 | 92 | 50 | 56753 | **60,24** |
| **20** | 19 | 92 | 50 | 56754 | **60,24** |
| **21** | 19 | 92 | 50 | 56755 | **63,19** |
| **22** | 19 | 92 | 50 | 56756 | **63,19** |
| **23** | 19 | 92 | 50 | 56757 | **63,19** |
| **24** | 19 | 92 | 50 | 56758 | **63,27** |
| **25** | 19 | 92 | 50 | 56759 | **63,27** |
| **26** | 19 | 92 | 50 | 56760 | **75,76** |
| **27** | 19 | 92 | 50 | 56761 | **75,76** |
| **28** | 19 | 92 | 50 | 56762 | **75,89** |
| **29** | 19 | 92 | 50 | 56763 | **75,89** |

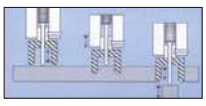
| D mm | d mm | L mm | l mm | N° Art. TCT | € |
|---|---|---|---|---|---|
| **30** | 19 | 92 | 50 | 56764 | **75,89** |
| **31** | 19 | 92 | 50 | 56765 | **91,37** |
| **32** | 19 | 92 | 50 | 56766 | **91,37** |
| **33** | 19 | 92 | 50 | 56767 | **91,37** |
| **34** | 19 | 92 | 50 | 56768 | **91,37** |
| **35** | 19 | 92 | 50 | 56769 | **91,37** |
| **36** | 19 | 92 | 50 | 56770 | **104,31** |
| **37** | 19 | 92 | 50 | 56771 | **104,70** |
| **38** | 19 | 92 | 50 | 56772 | **104,70** |
| **39** | 19 | 92 | 50 | 56773 | **104,70** |
| **40** | 19 | 92 | 50 | 56774 | **104,70** |
| **41** | 19 | 92 | 50 | 56775 | **126,30** |
| **42** | 19 | 92 | 50 | 56776 | **126,30** |
| **43** | 19 | 92 | 50 | 56777 | **126,30** |
| **44** | 19 | 92 | 50 | 56778 | **126,30** |
| **45** | 19 | 92 | 50 | 56779 | **126,30** |

| D mm | d mm | L mm | l mm | N° Art. TCT | € |
|---|---|---|---|---|---|
| **46** | 19 | 92 | 50 | 56780 | **147,03** |
| **47** | 19 | 92 | 50 | 56781 | **147,12** |
| **48** | 19 | 92 | 50 | 56782 | **147,12** |
| **49** | 19 | 92 | 50 | 56783 | **147,12** |
| **50** | 19 | 92 | 50 | 56784 | **147,12** |
| **51** | 19 | 92 | 50 | 56785 | **166,26** |
| **52** | 19 | 92 | 50 | 56786 | **166,89** |
| **53** | 19 | 92 | 50 | 56787 | **166,89** |
| **54** | 19 | 92 | 50 | 56788 | **166,89** |
| **55** | 19 | 92 | 50 | 56789 | **166,89** |
| **56** | 19 | 92 | 50 | 56790 | **183,06** |
| **57** | 19 | 92 | 50 | 56791 | **183,06** |
| **58** | 19 | 92 | 50 | 56792 | **183,06** |
| **59** | 19 | 92 | 50 | 56793 | **194,04** |
| **60** | 19 | 92 | 50 | 56794 | **199,56** |

# Ref. 4075

## EXPULSORES
Pilot Pins
Ejecteurs

HSS

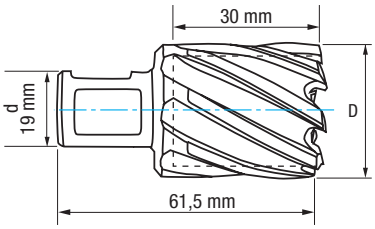


| D mm | L mm | Cap. mm | Para/For/Pour Ref. | N° Art. HSS | € |
|---|---|---|---|---|---|
| **6,34** | 106 | 12-17 | 4077 (50 mm) | 61501 | **22,05** |
| *** 6,34** | 127 | 12-17 | 4077 (50 mm) | 71878 | **18,18** |
| **7,98** | 105 | 18-60 | 4077 (50 mm) | 61503 | **26,46** |
| *** 7,98** | 130 | 18-60 | 4077 (50 mm) | 71883 | **33,18** |

* **Para uso con adaptador**
**When using with adapter** / Pour usage avec adaptateur

# Ref. 4070

## FRESA HUECA MÁQUINAS ELECTROMAGNÉTICAS HSS CORTA
Short HSS Annular Cutter Core Drill
Fraise à carotter pour unité de perçage électromagnétique HSS courte




HSS-XT

**Serie Corta**
Short Length
Série courte

**Rectificado**
**Ground**
Taillé meulé

**Aceros Construcción**
Structural Steels
Aciers de construction

**Apto con Poca Lubricación**
**Suitable with Minimal Cooling**
Apte avec lubrification minimale

DOBLE
WELDON

| Material | | RPM | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | Ø 12 | Ø 14 | Ø 16 | Ø 18 | Ø 20 | Ø 25 | Ø 30 | Ø 40 | Ø 50 | Ø 60 |
| P | P.1 | 344 | 295 | 258 | 229 | 206 | 165 | 137 | 103 | 82 | 68 |
| | P.2 | 265 | 227 | 198 | 176 | 159 | 127 | 106 | 79 | 63 | 53 |
| K | K.1 | 477 | 409 | 358 | 318 | 286 | 229 | 190 | 143 | 114 | 95 |
| N | N.3 | 981 | 841 | 736 | 654 | 588 | 471 | 392 | 294 | 235 | 196 |

| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| 12 | 19 | 61,5 | 30 | 21106 | **25,86** |
| 13 | 19 | 61,5 | 30 | 21107 | **25,86** |
| 14 | 19 | 61,5 | 30 | 21108 | **26,81** |
| 15 | 19 | 61,5 | 30 | 21109 | **27,93** |
| 16 | 19 | 61,5 | 30 | 21110 | **29,05** |
| 17 | 19 | 61,5 | 30 | 21111 | **29,98** |
| 18 | 19 | 61,5 | 30 | 21112 | **31,10** |
| 19 | 19 | 61,5 | 30 | 21113 | **31,86** |
| 20 | 19 | 61,5 | 30 | 21114 | **33,35** |
| 21 | 19 | 61,5 | 30 | 21115 | **35,61** |
| 22 | 19 | 61,5 | 30 | 21116 | **36,92** |
| 23 | 19 | 61,5 | 30 | 21117 | **38,43** |
| 24 | 19 | 61,5 | 30 | 21118 | **39,93** |
| 25 | 19 | 61,5 | 30 | 21119 | **41,23** |
| 26 | 19 | 61,5 | 30 | 21120 | **42,73** |
| 27 | 19 | 61,5 | 30 | 21121 | **43,10** |

| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| 28 | 19 | 61,5 | 30 | 21122 | **45,74** |
| 29 | 19 | 61,5 | 30 | 21123 | **47,24** |
| 30 | 19 | 61,5 | 30 | 21124 | **48,54** |
| 31 | 19 | 61,5 | 30 | 21125 | **52,85** |
| 32 | 19 | 61,5 | 30 | 21126 | **56,60** |
| 33 | 19 | 61,5 | 30 | 21127 | **59,60** |
| 34 | 19 | 61,5 | 30 | 21128 | **68,00** |
| 35 | 19 | 61,5 | 30 | 21129 | **75,26** |
| 36 | 19 | 61,5 | 30 | 21130 | **75,50** |
| 37 | 19 | 61,5 | 30 | 21131 | **76,86** |
| 38 | 19 | 61,5 | 30 | 21132 | **77,62** |
| 39 | 19 | 61,5 | 30 | 21133 | **78,34** |
| 40 | 19 | 61,5 | 30 | 21134 | **78,64** |
| 41 | 19 | 61,5 | 30 | 21135 | **80,50** |
| 42 | 19 | 61,5 | 30 | 21136 | **85,83** |
| 43 | 19 | 61,5 | 30 | 21137 | **89,74** |

| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| 44 | 19 | 61,5 | 30 | 21138 | **92,60** |
| 45 | 19 | 61,5 | 30 | 21139 | **93,67** |
| 46 | 19 | 61,5 | 30 | 21140 | **95,77** |
| 47 | 19 | 61,5 | 30 | 21141 | **97,56** |
| 48 | 19 | 61,5 | 30 | 21142 | **101,50** |
| 49 | 19 | 61,5 | 30 | 21143 | **102,21** |
| 50 | 19 | 61,5 | 30 | 21144 | **108,25** |
| 51 | 19 | 61,5 | 30 | 21145 | **110,39** |
| 52 | 19 | 61,5 | 30 | 21146 | **113,95** |
| 53 | 19 | 61,5 | 30 | 21147 | **116,57** |
| 54 | 19 | 61,5 | 30 | 21148 | **122,43** |
| 55 | 19 | 61,5 | 30 | 21149 | **124,16** |
| 56 | 19 | 61,5 | 30 | 21150 | **128,28** |
| 57 | 19 | 61,5 | 30 | 21151 | **132,43** |
| 58 | 19 | 61,5 | 30 | 21152 | **134,50** |
| 59 | 19 | 61,5 | 30 | 21153 | **142,08** |
| 60 | 19 | 61,5 | 30 | 21154 | **150,41** |

### Set 6 Pcs

| Cont. Ø | N° Art. HSS | € |
|---|---|---|
| **12-14-16-18-20-22** | 66858 | **183,09** |

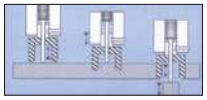
### Set 5 Pcs

| Cont. Ø | N° Art. HSS | € |
|---|---|---|
| **24-26-28-30-32** | 66859 | **233,54** |

# Ref. 4075

## EXPULSORES
Pilot Pins
Ejecteurs

HSS

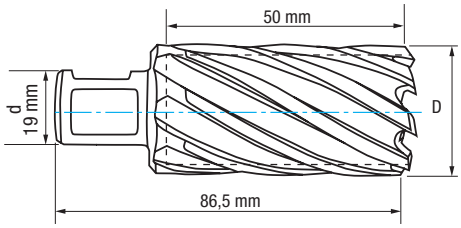


| D mm | L mm | Para/For/Pour Ref. | N° Art. HSS | € |
|---|---|---|---|---|
| **6,34** | 77 | 4070 (30 mm) | 61502 | **9,39** |
| ***6,34** | 102 | 4070 (30 mm) | 61500 | **12,96** |

*** Para uso con adaptador**
**When using with adapter** / Pour usage avec adaptateur

# Ref. 4071

## FRESA HUECA MÁQUINAS ELECTROMAGNÉTICAS HSS LARGA
Long HSS Annular Cutter Core Drill
Fraise à carotter pour unité de perçage électromagnétique HSS longue




HSS-XT

**Serie Larga**
Long Length
Série longue

**Rectificado Ground**
Taillé meulé

**Aceros Construcción**
Structural Steels
Aciers de construction

**Apto con Poca Lubricación**
**Suitable with Minimal Cooling**
Apte avec lubrification minimale

DOBLE WELDON

| Material | | RPM | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | Ø 12 | Ø 14 | Ø 16 | Ø 18 | Ø 20 | Ø 25 | Ø 30 | Ø 40 | Ø 50 | Ø 60 |
| P | P.1 | 344 | 295 | 258 | 229 | 206 | 165 | 137 | 103 | 82 | 68 |
| | P.2 | 265 | 227 | 198 | 176 | 159 | 127 | 106 | 79 | 63 | 53 |
| K | K.1 | 477 | 409 | 358 | 318 | 286 | 229 | 190 | 143 | 114 | 95 |
| N | N.3 | 981 | 841 | 736 | 654 | 588 | 471 | 392 | 294 | 235 | 196 |

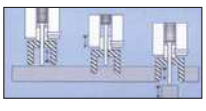
| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **12** | 19 | 86,5 | 50 | 73338 | **35,82** |
| **13** | 19 | 86,5 | 50 | 73339 | **35,82** |
| **14** | 19 | 86,5 | 50 | 21157 | **37,13** |
| **15** | 19 | 86,5 | 50 | 21158 | **38,62** |
| **16** | 19 | 86,5 | 50 | 21159 | **41,23** |
| **17** | 19 | 86,5 | 50 | 21160 | **42,73** |
| **18** | 19 | 86,5 | 50 | 21161 | **45,93** |
| **19** | 19 | 86,5 | 50 | 21162 | **46,85** |
| **20** | 19 | 86,5 | 50 | 21163 | **48,18** |
| **21** | 19 | 86,5 | 50 | 21164 | **53,60** |
| **22** | 19 | 86,5 | 50 | 21165 | **55,11** |
| **23** | 19 | 86,5 | 50 | 21166 | **56,98** |
| **24** | 19 | 86,5 | 50 | 21167 | **58,67** |
| **25** | 19 | 86,5 | 50 | 21168 | **60,35** |
| **26** | 19 | 86,5 | 50 | 21169 | **62,23** |
| **27** | 19 | 86,5 | 50 | 21170 | **65,22** |
| **28** | 19 | 86,5 | 50 | 21171 | **68,22** |
| **29** | 19 | 86,5 | 50 | 21172 | **70,83** |
| **30** | 19 | 86,5 | 50 | 21173 | **71,65** |
| **31** | 19 | 86,5 | 50 | 21174 | **75,26** |
| **32** | 19 | 86,5 | 50 | 21175 | **78,55** |
| **33** | 19 | 86,5 | 50 | 21177 | **82,19** |
| **34** | 19 | 86,5 | 50 | 21178 | **85,82** |
| **35** | 19 | 86,5 | 50 | 21179 | **89,45** |
| **36** | 19 | 86,5 | 50 | 21180 | **92,00** |

| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **37** | 19 | 86,5 | 50 | 21181 | **95,45** |
| **38** | 19 | 86,5 | 50 | 21182 | **98,18** |
| **39** | 19 | 86,5 | 50 | 21183 | **101,09** |
| **40** | 19 | 86,5 | 50 | 21184 | **106,33** |
| **41** | 19 | 86,5 | 50 | 21185 | **108,07** |
| **42** | 19 | 86,5 | 50 | 21186 | **109,47** |
| **43** | 19 | 86,5 | 50 | 21187 | **112,26** |
| **44** | 19 | 86,5 | 50 | 21188 | **113,65** |
| **45** | 19 | 86,5 | 50 | 21189 | **117,13** |
| **46** | 19 | 86,5 | 50 | 21190 | **118,53** |
| **47** | 19 | 86,5 | 50 | 21191 | **125,15** |
| **48** | 19 | 86,5 | 50 | 21192 | **128,28** |
| **49** | 19 | 86,5 | 50 | 21193 | **128,98** |
| **50** | 19 | 86,5 | 50 | 21194 | **131,77** |
| **51** | 19 | 86,5 | 50 | 21195 | **139,44** |
| **52** | 19 | 86,5 | 50 | 21196 | **145,02** |
| **53** | 19 | 86,5 | 50 | 21197 | **162,43** |
| **54** | 19 | 86,5 | 50 | 21198 | **164,84** |
| **55** | 19 | 86,5 | 50 | 21199 | **166,42** |
| **56** | 19 | 86,5 | 50 | 21200 | **171,40** |
| **57** | 19 | 86,5 | 50 | 21201 | **182,11** |
| **58** | 19 | 86,5 | 50 | 21202 | **182,15** |
| **59** | 19 | 86,5 | 50 | 21203 | **192,50** |
| **60** | 19 | 86,5 | 50 | 21204 | **199,53** |

# Ref. 4075

## EXPULSORES
Pilot Pins
Ejecteurs

HSS

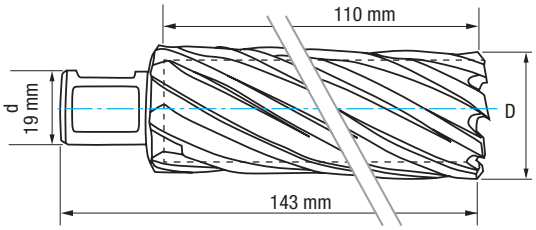


| D mm | L mm | Para/For/Pour Ref. | N° Art. HSS | € |
|---|---|---|---|---|
| **6,34** | 102 | 4071 (50 mm) | 61500 | **12,96** |
| ***6,34** | 127 | 4071 (50 mm) | 71878 | **18,18** |

* **Para uso con adaptador**
**When using with adapter** / Pour usage avec adaptateur

# Ref. 4072

## FRESA HUECA MÁQUINAS ELECTROMAGNÉTICAS HSS EXTRA LARGA
Extra Long HSS Annular Cutter Core Drill
Fraise à carotter pour unité de perçage électromagnétique HSS extra-longue




HSS-XT

**Serie Extra-Larga**
Extra-Long Series
Série extra-longue

**Aceros Construcción**
Structural Steels
Aciers de construction

**Apto con Poca Lubricación**
**Suitable with Minimal Cooling**
Apte avec lubrification minimale

DOBLE
WELDON

| Material | | RPM | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | Ø 12 | Ø 14 | Ø 16 | Ø 18 | Ø 20 | Ø 25 | Ø 30 | Ø 40 | Ø 50 | Ø 60 |
| P | P.1 | 344 | 295 | 258 | 229 | 206 | 165 | 137 | 103 | 82 | 68 |
| | P.2 | 265 | 227 | 198 | 176 | 159 | 127 | 106 | 79 | 63 | 53 |
| K | K.1 | 477 | 409 | 358 | 318 | 286 | 229 | 190 | 143 | 114 | 95 |
| N | N.3 | 981 | 841 | 736 | 654 | 588 | 471 | 392 | 294 | 235 | 196 |

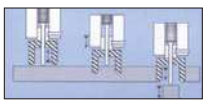
| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **20** | 19 | 143 | 110 | 56694 | **96,17** |
| **21** | 19 | 143 | 110 | 56695 | **97,99** |
| **22** | 19 | 143 | 110 | 56696 | **99,84** |
| **23** | 19 | 143 | 110 | 56697 | **101,82** |
| **24** | 19 | 143 | 110 | 56698 | **107,88** |
| **25** | 19 | 143 | 110 | 56699 | **109,86** |
| **26** | 19 | 143 | 110 | 56700 | **121,30** |
| **27** | 19 | 143 | 110 | 56701 | **123,50** |
| **28** | 19 | 143 | 110 | 56702 | **125,93** |
| **29** | 19 | 143 | 110 | 56703 | **128,29** |
| **30** | 19 | 143 | 110 | 56704 | **130,74** |
| **31** | 19 | 143 | 110 | 56706 | **136,40** |
| **32** | 19 | 143 | 110 | 56707 | **138,81** |
| **33** | 19 | 143 | 110 | 56708 | **148,63** |
| **34** | 19 | 143 | 110 | 56709 | **151,32** |
| **35** | 19 | 143 | 110 | 56710 | **154,09** |

| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **36** | 19 | 143 | 110 | 56711 | **156,94** |
| **37** | 19 | 143 | 110 | 56712 | **160,20** |
| **38** | 19 | 143 | 110 | 56714 | **163,21** |
| **39** | 19 | 143 | 110 | 56715 | **166,29** |
| **40** | 19 | 143 | 110 | 56716 | **169,46** |
| **41** | 19 | 143 | 110 | 56717 | **198,37** |
| **42** | 19 | 143 | 110 | 56718 | **201,69** |
| **43** | 19 | 143 | 110 | 56719 | **205,09** |
| **44** | 19 | 143 | 110 | 56721 | **208,57** |
| **45** | 19 | 143 | 110 | 56722 | **251,41** |
| **46** | 19 | 143 | 110 | 56724 | **254,82** |
| **47** | 19 | 143 | 110 | 56725 | **258,40** |
| **48** | 19 | 143 | 110 | 56727 | **261,86** |
| **49** | 19 | 143 | 110 | 56728 | **265,42** |
| **50** | 19 | 143 | 110 | 56730 | **269,04** |

# Ref. 4075

## EXPULSORES
Pilot Pins
Ejecteurs

HSS

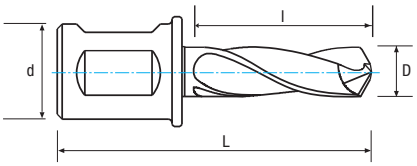


| D mm | L mm | Para/For/Pour Ref. | N° Art. HSS | € |
|---|---|---|---|---|
| **7,98** | 154 | 4072 (110 mm) | 61504 | **22,95** |
| ***7,98** | 180 | 4072 (110 mm) | 71885 | **34,73** |

* **Para uso con adaptador**
**When using with adapter** / Pour usage avec adaptateur

# Ref. 4079

## BROCA MÁQUINAS ELECTROMAGNÉTICAS HSS
HSS Solid Drill
Foret pour unité de perçage électromagnétique HSS




HSS-XT

**Serie Corta**
Short Length
Série courte

**Aceros Construcción**
Structural Steels
Aciers de construction

**Apto con Poca Lubricación**
**Suitable with Minimal Cooling**
Apte avec lubrification minimale

DOBLE WELDON

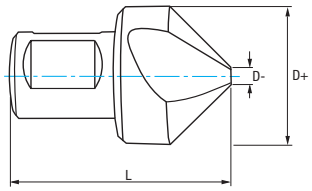
**P** **P.1 P.2** **Aceros Steels** Aciers

**K** **Fundición Cast Iron** Fonte

| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **6** | 19 | 63 | 25 | 69758 | **24,89** |
| **8** | 19 | 63 | 25 | 69761 | **24,89** |
| **10** | 19 | 63 | 25 | 69763 | **25,86** |
| **12** | 19 | 63 | 25 | 69768 | **28,74** |
| **14** | 19 | 63 | 25 | 69769 | **29,79** |

# Ref. 4076

## AVELLANADOR MÁQUINA ELECTROMAGNÉTICA
Annular Cutter Core Drill Countersink
Fraise à noyer pour unité de perçage électromagnétique




HSS-XT

3 Z

DOBLE WELDON

**P** **P.1 P.5** **Aceros Steels** Aciers

**M** **INOX Stainless Steel** Acier INOX

**K** **Fundición Cast Iron** Fonte

**N** **N.1 - N.2 N.3 - N.4 N.5** **Cobre** / **Copper** / Cuivre **Latón** / **Brass** / Laiton **Aluminio** / **Aluminium**

**Madera Wood** Bois

| D+ mm | D- mm | d mm | L mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **25** | 3 | 19 | 45 | 61505 | **119,89** |
| **30** | 3 | 19 | 47 | 61506 | **120,52** |
| **40** | 3 | 19 | 52 | 61507 | **139,70** |
| **50** | 3 | 19 | 57 | 61508 | **159,03** |
| **55** | 3 | 19 | 60 | 61509 | **177,87** |

# Ref. 4074

## ADAPTADOR FRESA HUECA MÁQUINA ELECTROMAGNÉTICA
Annular Cutter Core Drill Adaptor
Adaptateur pour fraise à carotter pour unité de perçage électromagnétique

| Fresa Cutter Fraise | Máquina Machine | Expulsor mm Pilot Pin Ejecteur | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| Doble Weldon | Fein Quick In | 6,35 | 51,20 | 28,60 | 61510 | **29,35** |
| Doble Weldon | Fein Quick In | 7,98 | 51,20 | 28,60 | 61511 | **29,35** |

| Fresa Cutter Fraise | Máquina Machine | Expulsor mm Pilot Pin Ejecteur | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| Doble Weldon | Universal | 6,35 | 51,20 | 28,60 | 61512 | **28,78** |
| Doble Weldon | Universal | 7,98 | 51,20 | 28,60 | 61513 | **28,78** |

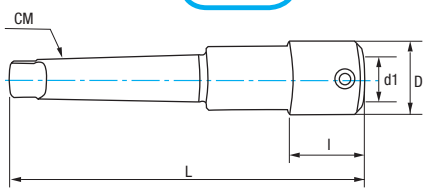
| Entrada In Entrée | Salida Out Sortie | L mm | N° Art. HSS | € |
|---|---|---|---|---|
| Doble Weldon | 1/2×20h | 43 | 83450 | **29,93** |

| Entrada In Entrée | Salida Out Sortie | L mm | N° Art. HSS | € |
|---|---|---|---|---|
| Doble Weldon | B16 | 57 | 83449 | **29,93** |

# Ref. 4073

## CONO PORTA FRESAS HUECAS
Holder for annular cutters
Cône pour porte-fraise à carotter pour unité de perçage électromagnétique

New!




| CM | D mm | L mm | l mm | d1 mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| **2** | 37 | 165 | 37 | 19 | 84115 | **69,24** |
| **3** | 37 | 175 | 37 | 19 | 84116 | **74,32** |

**Llave Allen incluida**
Allen key included
Clé Allen incluse

# ELECCIÓN ADAPTADORES FRESAS HUECAS DOBLE WELDON
Double Weldon Annular Cutter Core Drill Adaptor Choice
Choix d'adaptateurs pour fraises à carotter Double Weldon

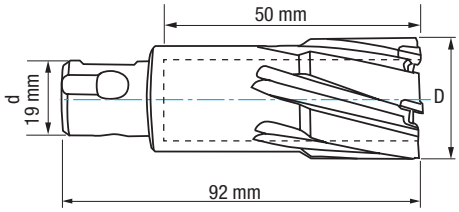
Ref. 4075 | Ref. 4074 | Ref. 4075

| Fresa Cutter Fraise DOBLE WELDON | Expulsor sin Adaptador Pilot Pin without adapter Ejecteur sans adaptateur | Adaptador Máquina Adaptor Machine Adaptateur Machine FEIN QUICK IN | * Expulsor para uso con adaptador * Pilot Pin when using with Adapter * Ejecteur pour usage avec adaptateur |
|---|---|---|---|
| 4078 35 mm | (12-17 mm) **6,34 × 90 mm.** Art. 65905 | In: 18 mm / Out: 19 mm **Art. 61510** | (12-17 mm) *** 6,34 × 116 mm.** Art. 71750 |
| 4077 50 mm | (12-17 mm) **6,34 × 106 mm.** Art. 61501 | | (12-17 mm) *** 6,34 × 127 mm.** Art. 71878 |
| 4070 30 mm | **6,34 × 77 mm.** Art. 61502 | | *** 6,34 × 102 mm.** Art. 61500 |
| 4071 50 mm | **6,34 × 102 mm.** Art. 61500 | | *** 6,34 × 127 mm.** Art. 71878 |
| 4078 35 mm | (18-60 mm) **7,98 × 90 mm.** Art. 65907 | In: 18 mm / Out: 19 mm **Art. 61511** | (18-60 mm) *** 7,98 × 118 mm.** Art. 71880 |
| 4077 50 mm | (18-60 mm) **7,98 × 105 mm.** Art. 61503 | | (18-60 mm) *** 7,98 × 130 mm.** Art. 71883 |
| 4072 110 mm | **7,98 × 154 mm.** Art. 61504 | | *** 7,98 × 180 mm.** Art. 71885 |

| Fresa Cutter Fraise DOBLE WELDON | Expulsor sin Adaptador Pilot Pin without adapter Ejecteur sans adaptateur | Adaptador Máquina Adaptor Machine Adaptateur Machine UNIVERSAL Nitto + Weldon | * Expulsor para uso con adaptador * Pilot Pin when using with Adapter * Ejecteur pour usage avec adaptateur |
|---|---|---|---|
| 4078 35 mm | (12-17 mm) **6,34 × 90 mm.** Art. 65905 | In: 19 mm / Out: 19 mm **Art. 61512** | (12-17 mm) *** 6,34 × 116 mm.** Art. 71750 |
| 4077 50 mm | (12-17 mm) **6,34 × 106 mm.** Art. 61501 | | (12-17 mm) *** 6,34 × 127 mm.** Art. 71878 |
| 4070 30 mm | **6,34 × 77 mm.** Art. 61502 | | *** 6,34 × 102 mm.** Art. 61500 |
| 4071 50 mm | **6,34 × 102 mm.** Art. 61500 | | *** 6,34 × 127 mm.** Art. 71878 |
| 4078 35 mm | (18-60 mm) **7,98 × 90 mm.** Art. 65907 | In: 19 mm / Out: 19 mm **Art. 61513** | (18-60 mm) *** 7,98 × 118 mm.** Art. 71880 |
| 4077 50 mm | (18-60 mm) **7,98 × 105 mm.** Art. 61503 | | (18-60 mm) *** 7,98 × 130 mm.** Art. 71883 |
| 4072 110 mm | **7,98 × 154 mm.** Art. 61504 | | *** 7,98 × 180 mm.** Art. 71885 |

# Ref. 4067

## FRESA HUECA MÁQUINAS ELECTROMAGNÉTICAS TCT LARGA
Long TCT Annular Cutter Core Drill
Fraise à carotter pour unité de perçage électromagnétique TCT longue




MD/HM TCT

**Serie Larga**
Long Length
Série longue

**Apto con Poca Lubricación**
**Suitable with Minimal Cooling**
Apte avec lubrification minimale

**Apto para Madera**
**Suitable for Wood**
Adapté au bois

UNIVERSAL: NITTO + WELDON

| Material | | RPM | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | Ø 12 | Ø 14 | Ø 16 | Ø 18 | Ø 20 | Ø 25 | Ø 30 | Ø 40 | Ø 50 | Ø 60 |
| P | P.1 | 981 | 841 | 736 | 654 | 588 | 471 | 392 | 294 | 235 | 196 |
| | P.2 | 928 | 795 | 696 | 618 | 557 | 445 | 371 | 278 | 222 | 185 |
| | P.3 | 795 | 682 | 596 | 530 | 477 | 381 | 318 | 238 | 190 | 159 |
| M | | 530 | 454 | 397 | 353 | 318 | 254 | 212 | 159 | 127 | 106 |
| K | K.1 | 1591 | 1364 | 1193 | 1061 | 954 | 763 | 636 | 477 | 381 | 318 |
| N | N.1 | 928 | 795 | 696 | 618 | 557 | 445 | 371 | 278 | 222 | 185 |
| | N.2 | 928 | 795 | 696 | 618 | 557 | 445 | 371 | 278 | 222 | 185 |
| | N.3 | 2387 | 2046 | 1790 | 1591 | 1432 | 1145 | 954 | 716 | 572 | 477 |

| D mm | d mm | L mm | l mm | N° Art. TCT | € |
|---|---|---|---|---|---|
| 14 | 19 | 92 | 50 | 61248 | 60,24 |
| 15 | 19 | 92 | 50 | 61249 | 60,24 |
| 16 | 19 | 92 | 50 | 61250 | 60,24 |
| 17 | 19 | 92 | 50 | 61251 | 60,24 |
| 18 | 19 | 92 | 50 | 61252 | 60,24 |
| 19 | 19 | 92 | 50 | 61253 | 60,24 |
| 20 | 19 | 92 | 50 | 61254 | 60,24 |
| 21 | 19 | 92 | 50 | 61255 | 63,19 |
| 22 | 19 | 92 | 50 | 61256 | 63,19 |
| 23 | 19 | 92 | 50 | 61257 | 63,19 |
| 24 | 19 | 92 | 50 | 61258 | 63,27 |
| 25 | 19 | 92 | 50 | 61259 | 63,27 |
| 26 | 19 | 92 | 50 | 61260 | 75,76 |
| 27 | 19 | 92 | 50 | 61261 | 75,76 |
| 28 | 19 | 92 | 50 | 61262 | 75,89 |
| 29 | 19 | 92 | 50 | 61263 | 75,89 |

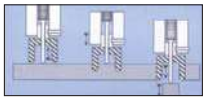
| D mm | d mm | L mm | l mm | N° Art. TCT | € |
|---|---|---|---|---|---|
| 30 | 19 | 92 | 50 | 61264 | 75,89 |
| 31 | 19 | 92 | 50 | 61265 | 91,37 |
| 32 | 19 | 92 | 50 | 61266 | 91,37 |
| 33 | 19 | 92 | 50 | 61267 | 91,37 |
| 34 | 19 | 92 | 50 | 61268 | 91,37 |
| 35 | 19 | 92 | 50 | 61269 | 91,37 |
| 36 | 19 | 92 | 50 | 61270 | 104,31 |
| 37 | 19 | 92 | 50 | 61271 | 104,70 |
| 38 | 19 | 92 | 50 | 61272 | 104,70 |
| 39 | 19 | 92 | 50 | 61273 | 104,70 |
| 40 | 19 | 92 | 50 | 61274 | 104,70 |
| 41 | 19 | 92 | 50 | 61275 | 126,30 |
| 42 | 19 | 92 | 50 | 61276 | 126,30 |
| 43 | 19 | 92 | 50 | 61277 | 126,30 |
| 44 | 19 | 92 | 50 | 61278 | 126,30 |
| 45 | 19 | 92 | 50 | 61279 | 126,30 |

| D mm | d mm | L mm | l mm | N° Art. TCT | € |
|---|---|---|---|---|---|
| 46 | 19 | 92 | 50 | 61280 | 147,03 |
| 47 | 19 | 92 | 50 | 61281 | 147,12 |
| 48 | 19 | 92 | 50 | 61282 | 147,12 |
| 49 | 19 | 92 | 50 | 61283 | 147,12 |
| 50 | 19 | 92 | 50 | 61199 | 147,12 |
| 51 | 19 | 92 | 50 | 61284 | 166,26 |
| 52 | 19 | 92 | 50 | 61285 | 166,89 |
| 53 | 19 | 92 | 50 | 61286 | 166,89 |
| 54 | 19 | 92 | 50 | 61287 | 166,89 |
| 55 | 19 | 92 | 50 | 61288 | 166,89 |
| 56 | 19 | 92 | 50 | 61289 | 183,06 |
| 57 | 19 | 92 | 50 | 61290 | 183,06 |
| 58 | 19 | 92 | 50 | 61291 | 183,06 |
| 59 | 19 | 92 | 50 | 61292 | 194,04 |
| 60 | 19 | 92 | 50 | 61293 | 199,56 |

# Ref. 4075

## EXPULSORES
Pilot Pins
Ejecteurs

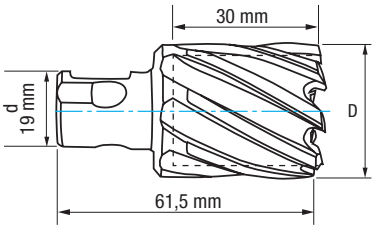
HSS



| D mm | L mm | Cap. mm | Para/For/Pour Ref. | N° Art. HSS | € |
|---|---|---|---|---|---|
| 6,34 | 106 | 12-17 | 4067 (50 mm) | 61501 | 22,05 |
| 7,98 | 105 | 18-60 | 4067 (50 mm) | 61503 | 26,46 |

# Ref. 4060

## FRESA HUECA MÁQUINAS ELECTROMAGNÉTICAS HSS CORTA
Short HSS Annular Cutter Core Drill
Fraise à carotter pour unité de perçage électromagnétique HSS courte




HSS-XT

**Serie Corta**
Short Length
Série courte

**Rectificado Ground**
Taillé meulé

**Aceros Construcción**
Structural Steels
Aciers de construction

**Apto con Poca Lubricación**
**Suitable with Minimal Cooling**
Apte avec lubrification minimale

UNIVERSAL: NITTO + WELDON

| Material | | RPM | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | Ø 12 | Ø 14 | Ø 16 | Ø 18 | Ø 20 | Ø 25 | Ø 30 | Ø 40 | Ø 50 | Ø 60 |
| P | P.1 | 344 | 295 | 258 | 229 | 206 | 165 | 137 | 103 | 82 | 68 |
| | P.2 | 265 | 227 | 198 | 176 | 159 | 127 | 106 | 79 | 63 | 53 |
| K | K.1 | 477 | 409 | 358 | 318 | 286 | 229 | 190 | 143 | 114 | 95 |
| N | N.3 | 981 | 841 | 736 | 654 | 588 | 471 | 392 | 294 | 235 | 196 |

| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **12** | 19 | 61,5 | 30 | 61120 | **25,86** |
| **13** | 19 | 61,5 | 30 | 61121 | **25,86** |
| **14** | 19 | 61,5 | 30 | 61122 | **26,81** |
| **15** | 19 | 61,5 | 30 | 61123 | **27,93** |
| **16** | 19 | 61,5 | 30 | 61124 | **29,05** |
| **17** | 19 | 61,5 | 30 | 61125 | **29,98** |
| **18** | 19 | 61,5 | 30 | 61126 | **31,10** |
| **19** | 19 | 61,5 | 30 | 61127 | **31,86** |
| **20** | 19 | 61,5 | 30 | 61128 | **33,35** |
| **21** | 19 | 61,5 | 30 | 61129 | **35,61** |
| **22** | 19 | 61,5 | 30 | 61130 | **36,92** |
| **23** | 19 | 61,5 | 30 | 61131 | **38,43** |
| **24** | 19 | 61,5 | 30 | 61132 | **39,93** |
| **25** | 19 | 61,5 | 30 | 61133 | **41,23** |
| **26** | 19 | 61,5 | 30 | 61134 | **42,73** |
| **27** | 19 | 61,5 | 30 | 61135 | **43,10** |

| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **28** | 19 | 61,5 | 30 | 61136 | **45,74** |
| **29** | 19 | 61,5 | 30 | 61137 | **47,24** |
| **30** | 19 | 61,5 | 30 | 61138 | **48,54** |
| **31** | 19 | 61,5 | 30 | 61139 | **52,85** |
| **32** | 19 | 61,5 | 30 | 61140 | **56,60** |
| **33** | 19 | 61,5 | 30 | 61141 | **59,60** |
| **34** | 19 | 61,5 | 30 | 61142 | **68,00** |
| **35** | 19 | 61,5 | 30 | 61143 | **75,26** |
| **36** | 19 | 61,5 | 30 | 61144 | **75,50** |
| **37** | 19 | 61,5 | 30 | 61145 | **76,86** |
| **38** | 19 | 61,5 | 30 | 61146 | **77,62** |
| **39** | 19 | 61,5 | 30 | 61147 | **78,34** |
| **40** | 19 | 61,5 | 30 | 61148 | **78,64** |
| **41** | 19 | 61,5 | 30 | 61149 | **80,50** |
| **42** | 19 | 61,5 | 30 | 61150 | **85,83** |
| **43** | 19 | 61,5 | 30 | 61151 | **89,74** |

| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **44** | 19 | 61,5 | 30 | 61152 | **92,60** |
| **45** | 19 | 61,5 | 30 | 61153 | **93,67** |
| **46** | 19 | 61,5 | 30 | 61154 | **95,77** |
| **47** | 19 | 61,5 | 30 | 61155 | **97,56** |
| **48** | 19 | 61,5 | 30 | 61156 | **101,50** |
| **49** | 19 | 61,5 | 30 | 61157 | **102,21** |
| **50** | 19 | 61,5 | 30 | 61158 | **108,25** |
| **51** | 19 | 61,5 | 30 | 61159 | **110,39** |
| **52** | 19 | 61,5 | 30 | 61160 | **113,95** |
| **53** | 19 | 61,5 | 30 | 61161 | **116,57** |
| **54** | 19 | 61,5 | 30 | 61162 | **122,43** |
| **55** | 19 | 61,5 | 30 | 61163 | **124,16** |
| **56** | 19 | 61,5 | 30 | 61164 | **128,28** |
| **57** | 19 | 61,5 | 30 | 61165 | **132,43** |
| **58** | 19 | 61,5 | 30 | 61166 | **134,50** |
| **59** | 19 | 61,5 | 30 | 61167 | **142,08** |
| **60** | 19 | 61,5 | 30 | 61168 | **150,41** |

### Set 6 Pcs

| Cont. Ø | N° Art. HSS | € |
|---|---|---|
| **12-14-16-18-20-22** | 66860 | **183,09** |

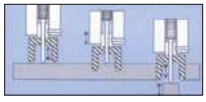
### Set 5 Pcs

| Cont. Ø | N° Art. HSS | € |
|---|---|---|
| **24-26-28-30-32** | 66861 | **233,54** |

# Ref. 4075

## EXPULSORES
Pilot Pins
Ejecteurs

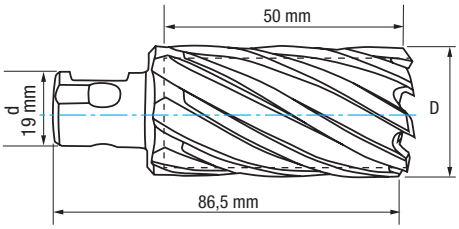
HSS



| D mm | L mm | Para/For/Pour Ref. | N° Art. HSS | € |
|---|---|---|---|---|
| **6,34** | 77 | 4060 (30 mm) | 61502 | **9,39** |

# Ref. 4061

## FRESA HUECA MÁQUINAS ELECTROMAGNÉTICAS HSS LARGA
Long HSS Annular Cutter Core Drill
Fraise à carotter pour unité de perçage électromagnétique HSS longue




HSS-XT

**Serie Larga**
Long Length
Série longue

**Rectificado Ground**
Taillé meulé

**Aceros Construcción**
Structural Steels
Aciers de construction

**Apto con Poca Lubricación**
**Suitable with Minimal Cooling**
Apte avec lubrification minimale

UNIVERSAL:
NITTO +
WELDON

| Material | | RPM | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | Ø 12 | Ø 14 | Ø 16 | Ø 18 | Ø 20 | Ø 25 | Ø 30 | Ø 40 | Ø 50 | Ø 60 |
| P | P.1 | 344 | 295 | 258 | 229 | 206 | 165 | 137 | 103 | 82 | 68 |
| | P.2 | 265 | 227 | 198 | 176 | 159 | 127 | 106 | 79 | 63 | 53 |
| K | K.1 | 477 | 409 | 358 | 318 | 286 | 229 | 190 | 143 | 114 | 95 |
| N | N.3 | 981 | 841 | 736 | 654 | 588 | 471 | 392 | 294 | 235 | 196 |

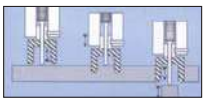
| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **12** | 19 | 86,5 | 50 | 73340 | **35,82** |
| **13** | 19 | 86,5 | 50 | 73342 | **35,82** |
| **14** | 19 | 86,5 | 50 | 61169 | **37,13** |
| **15** | 19 | 86,5 | 50 | 61170 | **38,62** |
| **16** | 19 | 86,5 | 50 | 61171 | **41,23** |
| **17** | 19 | 86,5 | 50 | 61172 | **42,73** |
| **18** | 19 | 86,5 | 50 | 61173 | **45,93** |
| **19** | 19 | 86,5 | 50 | 61174 | **46,85** |
| **20** | 19 | 86,5 | 50 | 61175 | **48,18** |
| **21** | 19 | 86,5 | 50 | 61176 | **53,60** |
| **22** | 19 | 86,5 | 50 | 61177 | **55,11** |
| **23** | 19 | 86,5 | 50 | 61178 | **56,98** |
| **24** | 19 | 86,5 | 50 | 61179 | **58,67** |
| **25** | 19 | 86,5 | 50 | 61180 | **60,35** |
| **26** | 19 | 86,5 | 50 | 61181 | **62,23** |
| **27** | 19 | 86,5 | 50 | 61182 | **65,22** |
| **28** | 19 | 86,5 | 50 | 61183 | **68,22** |
| **29** | 19 | 86,5 | 50 | 61184 | **70,83** |
| **30** | 19 | 86,5 | 50 | 61185 | **71,65** |
| **31** | 19 | 86,5 | 50 | 61186 | **75,26** |
| **32** | 19 | 86,5 | 50 | 61187 | **78,55** |
| **33** | 19 | 86,5 | 50 | 61188 | **82,19** |
| **34** | 19 | 86,5 | 50 | 61189 | **85,82** |
| **35** | 19 | 86,5 | 50 | 61190 | **89,45** |
| **36** | 19 | 86,5 | 50 | 61191 | **92,00** |

| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **37** | 19 | 86,5 | 50 | 61192 | **95,45** |
| **38** | 19 | 86,5 | 50 | 61193 | **98,18** |
| **39** | 19 | 86,5 | 50 | 61194 | **101,09** |
| **40** | 19 | 86,5 | 50 | 61195 | **106,33** |
| **41** | 19 | 86,5 | 50 | 61196 | **108,07** |
| **42** | 19 | 86,5 | 50 | 61197 | **109,47** |
| **43** | 19 | 86,5 | 50 | 61198 | **112,26** |
| **44** | 19 | 86,5 | 50 | 61200 | **113,65** |
| **45** | 19 | 86,5 | 50 | 61201 | **117,13** |
| **46** | 19 | 86,5 | 50 | 61202 | **118,53** |
| **47** | 19 | 86,5 | 50 | 61203 | **125,15** |
| **48** | 19 | 86,5 | 50 | 61204 | **128,28** |
| **49** | 19 | 86,5 | 50 | 61205 | **128,98** |
| **50** | 19 | 86,5 | 50 | 61206 | **131,77** |
| **51** | 19 | 86,5 | 50 | 61207 | **139,44** |
| **52** | 19 | 86,5 | 50 | 61208 | **145,02** |
| **53** | 19 | 86,5 | 50 | 61209 | **162,43** |
| **54** | 19 | 86,5 | 50 | 61210 | **164,84** |
| **55** | 19 | 86,5 | 50 | 61211 | **166,42** |
| **56** | 19 | 86,5 | 50 | 61212 | **171,40** |
| **57** | 19 | 86,5 | 50 | 61213 | **182,11** |
| **58** | 19 | 86,5 | 50 | 61214 | **182,15** |
| **59** | 19 | 86,5 | 50 | 61215 | **192,50** |
| **60** | 19 | 86,5 | 50 | 61216 | **199,53** |

# Ref. 4075

## EXPULSORES
Pilot Pins
Ejecteurs

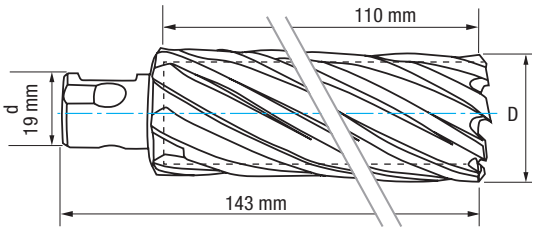
HSS



| D mm | L mm | Para/For/Pour Ref. | N° Art. HSS | € |
|---|---|---|---|---|
| **6,34** | 102 | 4061 (50 mm) | 61500 | **12,96** |

# Ref. 4062

## FRESA HUECA MÁQUINAS ELECTROMAGNÉTICAS HSS EXTRA LARGA
Extra Long HSS Annular Cutter Core Drill
Fraise à carotter pour unité de perçage électromagnétique HSS extra-longue




HSS-XT

**Serie Extra-Larga**
Extra-Long Series
Série extra-longue

**Aceros Construcción**
Structural Steels
Aciers de construction

**Apto con Poca Lubricación**
**Suitable with Minimal Cooling**
Apte avec lubrification minimale

UNIVERSAL:
NITTO +
WELDON

| Material | | RPM | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | Ø 12 | Ø 14 | Ø 16 | Ø 18 | Ø 20 | Ø 25 | Ø 30 | Ø 40 | Ø 50 | Ø 60 |
| P | P.1 | 344 | 295 | 258 | 229 | 206 | 165 | 137 | 103 | 82 | 68 |
| | P.2 | 265 | 227 | 198 | 176 | 159 | 127 | 106 | 79 | 63 | 53 |
| K | K.1 | 477 | 409 | 358 | 318 | 286 | 229 | 190 | 143 | 114 | 95 |
| N | N.3 | 981 | 841 | 736 | 654 | 588 | 471 | 392 | 294 | 235 | 196 |

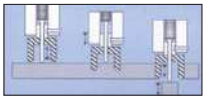
| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **20** | 19 | 143 | 110 | 61217 | **96,17** |
| **21** | 19 | 143 | 110 | 61218 | **97,99** |
| **22** | 19 | 143 | 110 | 61219 | **99,84** |
| **23** | 19 | 143 | 110 | 61220 | **101,82** |
| **24** | 19 | 143 | 110 | 61221 | **107,88** |
| **25** | 19 | 143 | 110 | 61222 | **109,86** |
| **26** | 19 | 143 | 110 | 61223 | **121,30** |
| **27** | 19 | 143 | 110 | 61224 | **123,50** |
| **28** | 19 | 143 | 110 | 61225 | **125,93** |
| **29** | 19 | 143 | 110 | 61226 | **128,29** |
| **30** | 19 | 143 | 110 | 61227 | **130,74** |
| **31** | 19 | 143 | 110 | 61228 | **136,40** |
| **32** | 19 | 143 | 110 | 61229 | **138,81** |
| **33** | 19 | 143 | 110 | 61230 | **148,63** |
| **34** | 19 | 143 | 110 | 61231 | **151,32** |
| **35** | 19 | 143 | 110 | 61232 | **154,09** |

| D mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **36** | 19 | 143 | 110 | 61233 | **156,94** |
| **37** | 19 | 143 | 110 | 61234 | **160,20** |
| **38** | 19 | 143 | 110 | 61235 | **163,21** |
| **39** | 19 | 143 | 110 | 61236 | **166,29** |
| **40** | 19 | 143 | 110 | 61237 | **169,46** |
| **41** | 19 | 143 | 110 | 61238 | **198,37** |
| **42** | 19 | 143 | 110 | 61239 | **201,69** |
| **43** | 19 | 143 | 110 | 61240 | **205,09** |
| **44** | 19 | 143 | 110 | 61241 | **208,57** |
| **45** | 19 | 143 | 110 | 61242 | **251,41** |
| **46** | 19 | 143 | 110 | 61243 | **254,82** |
| **47** | 19 | 143 | 110 | 61244 | **258,40** |
| **48** | 19 | 143 | 110 | 61245 | **261,86** |
| **49** | 19 | 143 | 110 | 61246 | **265,42** |
| **50** | 19 | 143 | 110 | 61247 | **269,04** |

# Ref. 4075

## EXPULSORES
Pilot Pins
Ejecteurs

HSS



| D mm | L mm | Para/For/Pour Ref. | N° Art. HSS | € |
|---|---|---|---|---|
| **7,98** | 154 | 4062 (110 mm) | 61504 | **22,95** |

# Ref. 1810

## PORTABROCAS AUTOAPRIETE ALTA PRECISIÓN
High Precision Self-Tightening Drill Chuck
Mandrin autofixation haute précision

- **Mecanismo de autoapriete que incrementa la fuerza de apriete en proporción al incremento de la torsión y evita el deslizamiento de la herramienta.**
- **Uso en taladros de precisión estacionarios, fresadoras y equipos de taladrado para producción en general.**
- **Partes expuestas al desgaste templadas y rectificadas para mantener la precisión y alargar la vida de la herramienta.**
- **Fijación a la máquina mediante conos DIN-238.**
- **Excentricidad giro broca máx. 0,04 mm.**

- **Self-Tightening feature increases gripping force proportionally to increased torque, preventing tool shank slippage.**
- **Use on high accuracy drill presses, jig borers, milling machines & production drillling equipment.**
- **All components exposed to wear are completely hardened to maintain accuracy & extend tool life.**
- **Mounts available: DIN-238 tapers.**
- **Maximum drill run-out of 0,04 mm.**

- Autofixation qui augmente la forze dans l´attachement selon la torsion et ne permet pas le glissage de l´outil.
- Utilisation en perceuses de colonne, machines CNC et centres de perçage de production.
- Parties exposées à l´usure traitées et taillées meulées pour maintenir la précision et prolonger la vie de l´outil.
- Fixation de la machine par cône DIN 238
- Excentricité du tournage du foret max. 0.04 mm

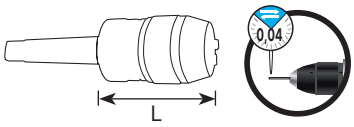
| Cap. mm | Cap. Pulg. Inches/Pouces | Fijación Fix | L mm | N° Art. | € |
|---|---|---|---|---|---|
| **0,5-10** | 0-3/8" | B-16 | 89 | 24547 | **204,46** |
| **1-13** | 1/32"-1/2" | B-16 | 103 | 24548 | **210,82** |
| **3-16** | 1/8"-5/8" | B-16 | 107 | 24549 | **224,05** |
| **3-16** | 1/8"-5/8" | B-18 | 107 | 24550 | **224,05** |

### Refs. 1810-1812

| Cap. mm | r.p.m. | Cap. mm | r.p.m. |
|---|---|---|---|
| 1,5 | 60.000 | 10,0 | 15.000 |
| 3,0 | 30.000 | 13,0 | 10.000 |
| 6,0 | 20.000 | 16,0 | 8.000 |
| 8,0 | 17.000 | | |

# Ref. 1812

## PORTABROCAS AUTOAPRIETE COMPACTO ALTA PRECISIÓN ESPIGA INTEGRADA
## High Precision Compact Self-Tightening Drill Chuck with Integral Shank
## Mandrin autofixation compact haute précision avec cheville integrée




- **Espiga integrada al casquillo interior ⇒ Imposibilidad de separación entre el portabrocas y la espiga ⇒ mayor solidez y precisión.**
- **Mecanismo de autoapriete que incrementa la fuerza de apriete en proporción al incremento de la torsión y evita el deslizamiento de la herramienta.**
- **Uso en taladros de precisión estacionarios, fresadoras y equipos de taladrado para producción en general.**
- **Dos ranuras fresadas + llave (incluida) para mayor par de apriete (hasta 3 veces superior respecto a sujeción manual).**
- **Fijación a máquina con conos morse.**
- **Excentricidad giro broca máx. 0,04 mm.**

- **Arbor is integrated into the internal socket ⇒ Impossible for the arbor & the drill chuck to become separated ⇒ Greater solidity & precision.**
- **Self-Tightening feature increases gripping force proportionally to increased torque, preventing tool shank slippage.**
- **Use on high accuracy drill presses, jig borers, milling machines & production drillling equipment.**
- **Milled wrench flats and spanner wrench (included) to allow higher gripping torque (up to 3 times higher than hand tightening).**
- **Mounts available: morse tapers.**
- **Maximum drill run-out of 0,04 mm.**

- Cheville intégrée à la douille intérieur. Impossible séparer le mandrin et la cheville. Plus de précision et solidité
- Autofixation qui augmente la forze dans l´attachement selon la torsion et ne permet pas le glissage de l´outil.
- Utilisation en perceuses de colonne, machines CNC et centres de perçage de production.
- 2 rainures fraisées + clé (inclus) pour plus de fixation (jusqu´à 3 fois supérieure à la fixation manuelle)
- Fixation à la machine avec cône morse
- Excentricité du tournage foret max. 0.04 mm

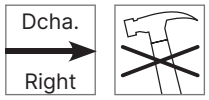
| **Cap. mm** | **Cap. Pulg. Inches**/Pouces | **Fijación Fix** | **L mm** | **N° Art.** | **€** |
|---|---|---|---|---|---|
| **1-13** | 1/32"-1/2" | MT2 | 92 | 24554 | **256,70** |
| **1-13** | 1/32"-1/2" | MT3 | 92 | 24555 | **260,26** |
| **3-16** | 1/8"-5/8" | MT3 | 96 | 24556 | **284,44** |
| **3-16** | 1/8"-5/8" | MT4 | 96 | 24557 | **290,66** |

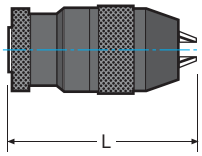
**Refs. 1810-1812**

| **Cap. mm** | **r.p.m.** | **Cap. mm** | **r.p.m.** |
|---|---|---|---|
| 1,5 | 60.000 | 10,0 | 15.000 |
| 3,0 | 30.000 | 13,0 | 10.000 |
| 6,0 | 20.000 | 16,0 | 8.000 |
| 8,0 | 17.000 | | |

# Ref. 1803

## PORTABROCAS TALADROS PORTÁTILES Y ESTACIONARIOS
Portable & Stationary Drilling Machine Drill Chuck
Mandrins perceuses portables et fixes




| Mod. | Cap. mm | Fijación Fix. | L mm | Peso Weight Poids gr. | N° Art. | € | Garras Jaws Pinces Art. |
|---|---|---|---|---|---|---|---|
| **00101** | 0,8-10 | B12 | 86 | 619 | 16349 | **71,62** | 56894 |
| **00102** | 0,8-10 | 3/8X24 UNF | 78 | 451 | 16350 | **71,62** | 56894 |
| **00103** | 0,8-10 | 1/2X20UNF | 78 | 452 | 16351 | **71,62** | 56894 |
| **00131** | 1-13 | B16 | 103 | 800 | 16352 | **77,09** | 24565 |
| **00132** | 2-13 | 3/8X24 UNF | 83 | 764 | 16353 | **77,09** | 56894 |
| **00133** | 2-13 | 1/2X20 UNF | 83 | 583 | 16354 | **77,09** | 56894 |
| **00161** | 3-16 | B16 | 105 | 1.180 | 16355 | **131,15** | 24565 |
| **00162** | 3-16 | B18 | 105 | 1.152 | 16356 | **131,15** | 24565 |
| **00163** | 3-16 | 1/2X20 UNF | 105 | 1.185 | 16357 | **131,15** | 24565 |
| **00164** | 5-20 | B18 | 131 | 2.165 | 19957 | **165,53** | 24566 |

- **Uso Taladros industriales y profesionales**
- **Fijaciones:**
  **Rosca taladro portátil y Cónica taladro fijo**
- **Autoapriete automático**
- **Giro a derechas**

- **Use for Industrial & professional drills**
- **Fixing:**
  **Threaded portable drills & Tapered for fixed drills**
- **Automatic Self-Tightening**
- **Right turning**

- Usage perceuses industrielles et professionnelles
- Fixations:
  Filet perceuse portable et conique perceuse à colonne
- Amenchement automatique
- Tour à droite

# Ref. 1819

## ACCESORIOS PORTABROCAS PRECISIÓN
High Precision Drill Chuck Accessories
Accessoires mandrins précision

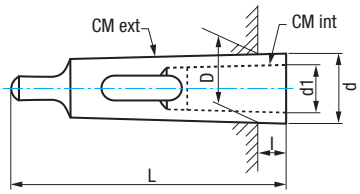
| Cap. mm | Garras Jaws Pinces | | N° Art. HSS | € |
|---|---|---|---|---|
| **0,5-10** | 1810 | 3 | 24564 | **39,74** |
| **1-13** | 1803/1810/1812 | 3 | 24565 | **40,08** |
| **3-16** | 1810/1812 | 3 | 24566 | **40,53** |
| **3-16** | 1803 | 3 | 56894 | **38,07** |

| Cap. mm | Tornillo Screw Vis | | N° Art. HSS | € |
|---|---|---|---|---|
| **10** | 1810 | 1 | 24593 | **15,32** |
| **13** | 1810 | 1 | 24596 | **16,50** |
| **13** | 1812 | 1 | 24598 | **16,50** |
| **16** | 1810 | 1 | 24597 | **16,50** |
| **16** | 1812 | 1 | 24601 | **20,45** |

| Cap. mm | Llave Key Clé | | N° Art. HSS | € |
|---|---|---|---|---|
| **13** | 1812 | 1 | 69318 | **24,10** |
| **16** | 1812 | 1 | 69319 | **24,10** |

# Ref. 1101

## CONO REDUCTOR
Reduction Sleeve
Douille de réduction

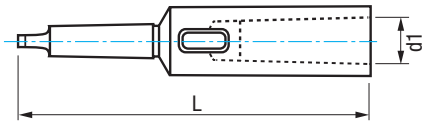



HSS | DIN 2185

| CM EXT. | CM INT. | L mm | l mm | D mm | d1 mm | d mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **2** | 1 | 92 | 17,00 | 17,780 | 12,065 | 18,60 | 16415 | **19,38** |
| **3** | 1 | 99 | 5,00 | 23,825 | 12,065 | 24,10 | 16416 | **26,56** |
| **3** | 2 | 112 | 18,00 | 23,825 | 17,780 | 24,70 | 16417 | **26,94** |
| **4** | 1 | 124 | 6,50 | 31,267 | 12,065 | 31,60 | 16418 | **42,29** |
| **4** | 2 | 124 | 6,50 | 31,267 | 17,780 | 31,60 | 16419 | **42,29** |
| **4** | 3 | 140 | 22,50 | 31,267 | 23,825 | 32,40 | 16420 | **42,29** |
| **5** | 3 | 156 | 6,50 | 44,399 | 23,825 | 44,70 | 16421 | **65,04** |
| **5** | 4 | 171 | 21,50 | 44,399 | 31,267 | 45,50 | 16422 | **65,30** |

# Ref. 1102

## ALARGADOR CONOS
Extension Socket
Douille d'augmentation

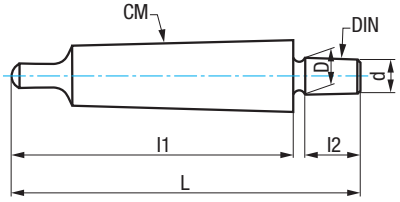



HSS | DIN 2187

| CM EXT. | CM INT. | L mm | d1 mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **1** | 2 | 160 | 17,78 | 16423 | **46,87** |
| **2** | 1 | 159 | 12,07 | 16427 | **36,29** |
| **2** | 2 | 176 | 17,78 | 16433 | **48,05** |
| **2** | 3 | 195 | 23,83 | 16424 | **61,89** |
| **3** | 1 | 176 | 12,07 | 16428 | **38,71** |
| **3** | 2 | 194 | 17,78 | 16429 | **45,64** |
| **3** | 3 | 215 | 23,83 | 16434 | **69,93** |
| **3** | 4 | 239 | 31,27 | 16425 | **92,84** |
| **4** | 1 | 200 | 12,07 | 16430 | **64,75** |
| **4** | 2 | 215 | 17,78 | 16431 | **65,46** |
| **4** | 3 | 240 | 23,83 | 16432 | **76,24** |
| **4** | 4 | 265 | 31,27 | 16435 | **110,17** |
| **4** | 5 | 299 | 44,39 | 16426 | **218,14** |

# Ref. 1103

## ESPIGA SUJECIÓN
Spike CM Taper
Arbre d'attachement

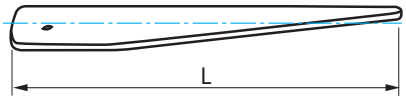



HSS

| CM | DIN | L mm | l1 mm | D mm | d mm | l2 mm | | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|---|
| **1** | B12 | 89,00 | 62,00 | 12,065 | 11,10 | 18,50 | 1 | 16440 | **12,24** |
| **2** | B12 | 106,00 | 75,00 | 12,065 | 11,10 | 18,50 | 1 | 16441 | **13,21** |
| **2** | B16 | 111,00 | 75,00 | 15,733 | 14,50 | 24,00 | 1 | 16442 | **13,21** |
| **2** | B18 | 118,00 | 75,00 | 17,780 | 16,20 | 32,00 | 1 | 16443 | **13,21** |
| **3** | B12 | 126,00 | 94,00 | 12,065 | 11,10 | 18,50 | 1 | 16444 | **16,06** |
| **3** | B16 | 134,00 | 94,00 | 15,733 | 14,50 | 24,00 | 1 | 16445 | **16,06** |
| **3** | B18 | 140,00 | 94,00 | 17,780 | 16,20 | 32,00 | 1 | 21873 | **16,06** |
| **4** | B16 | 158,00 | 117,50 | 15,733 | 14,50 | 24,00 | 1 | 16446 | **24,65** |
| **4** | B18 | 166,50 | 117,50 | 17,780 | 16,20 | 32,00 | 1 | 16447 | **24,65** |
| **5** | B16 | 194 | 149,50 | 15,733 | 14,50 | 24,00 | 1 | 66764 | **70,27** |
| **5** | B18 | 202 | 149,50 | 17,780 | 16,20 | 32,00 | 1 | 66765 | **70,27** |

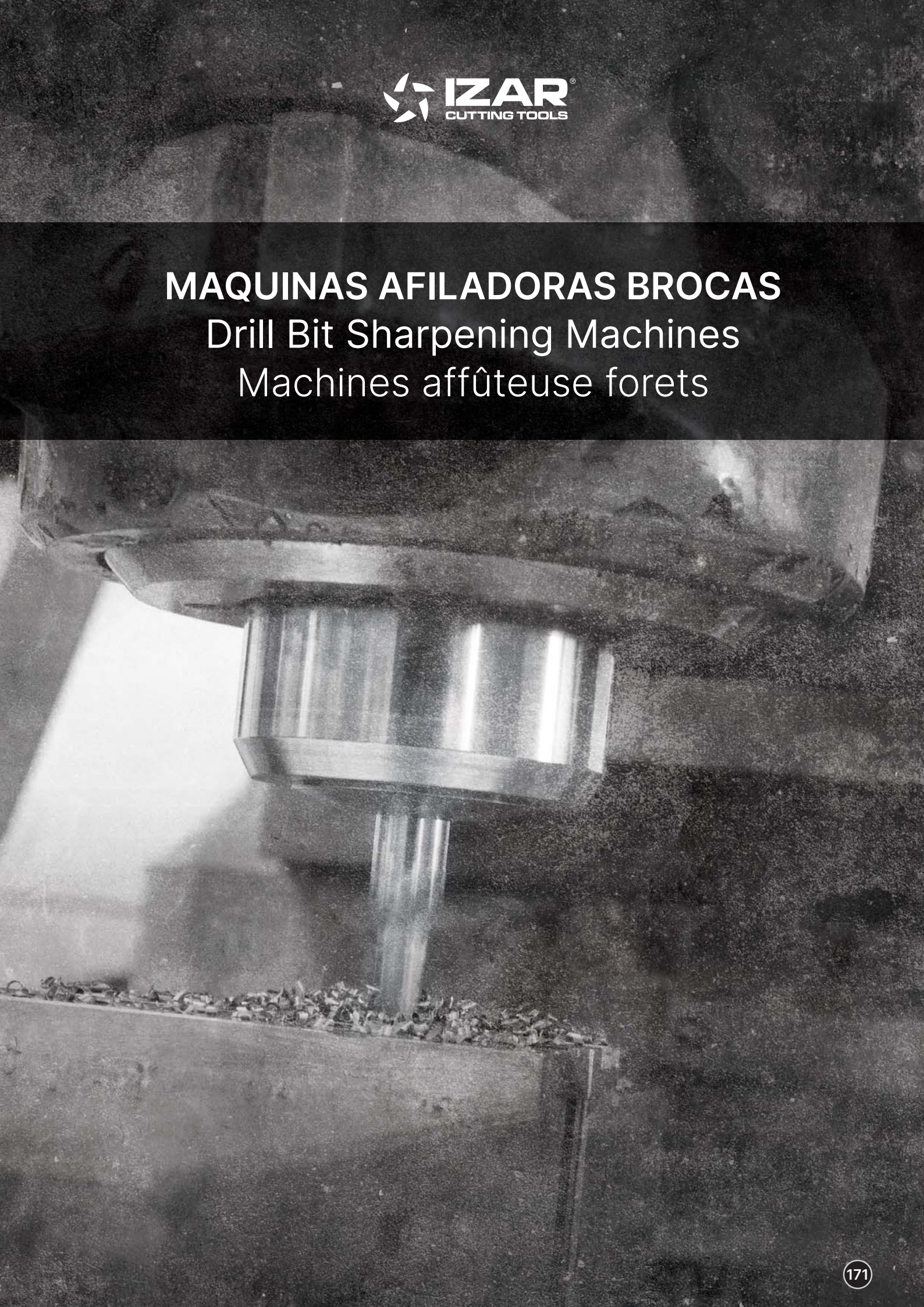
# Ref. 1104

## CUÑA EXPULSORA
Drill Drift
Chasse cône standard




HSS

| CM Ext. min. | CM Ext. max. | L mm | | N° Art. HSS | € |
|---|---|---|---|---|---|
| **1** | 2 | 116 | 1 | 16436 | **11,57** |
| **2** | 3 | 150 | 1 | 16437 | **13,98** |
| **3** | 4 | 199 | 1 | 16438 | **18,53** |
| **4** | 5 | 251 | 1 | 16439 | **25,03** |



# MAQUINAS AFILADORAS BROCAS
## Drill Bit Sharpening Machines
## Machines affûteuse forets

# Ref. 9995

## MÁQUINA AFILADORA BROCAS HEAVY DUTY
Heavy Duty Drill Bit Sharpening Machine
Machine affûteuse forets

### Mod. 0391

| Mod. | Cap. mm | Punta Point Pointe | Uso Use Usage | N° Art. | € |
|---|---|---|---|---|---|
| **0391** | 3-19 | 118°-140° | HSS, HSSE, TIN, MD/HM + Split Point | 60006 | **Consultar** |

### Mod. 3000

| Mod. | Cap. mm | Punta Point Pointe | Uso Use Usage | L mm min. | N° Art. | € |
|---|---|---|---|---|---|---|
| **3000** | 3-21 | 118°-150° | HSS, HSSE, TIN, MD/HM + Split Point | 50 | 60007* | **Consultar** |

*** Mod. 3000 bajo demanda / upon request** / sur demande

## Las afiladoras de herramientas de corte industriales más vendidas del mundo

**Tanto si su taller se especializa en la producción en masa de alta tecnología como en la fabricación creativa a medida, hay una afiladora DAREX que reducirá sus costes de herramientas y hará que sus trabajos más difíciles se desarrollen con fluidez. Estas afiladoras son totalmente válidas para afilar brocas de metal duro.**

**IZAR ofrece una amplia gama de afiladoras para fabricantes y constructores de todos los tamaños. Para los talleres pequeños que requieren un volumen de afilado bajo o esporádico, el modelo 0391 de IZAR es nuestro modelo más popular.**

**El modelo 3000 de IZAR y el Modelo 3000 AUTO de IZAR son las piezas fundamentales versátiles para la mayoría de los fabricantes de tamaño medio-grande.**

## The World's Best-Selling Industrial Cutting Tool Sharpeners

Whether your shop specializes in high-tech mass production or creative custom fabrication, there's a DAREX sharpener that will lower your tool costs and make your toughest Jobs run smoothly. These machines are perfectly suited for sharpening carbide material.

IZAR offers a wide range of sharpeners for manufacturers and fabricators of all sizes. For smaller shops with low-volume or intermittent sharpening needs, the IZAR Mod. 0391 is our most popular model

The IZAR Mod. 3000 and IZAR Mod. 3000 AUTO are the versatile workhorses for most mid-to-large size manufacturers.

# Ref. 9995

## MÁQUINA AFILADORA BROCAS HEAVY DUTY
Heavy Duty Drill Bit Sharpening Machine
Machine affûteuse forets

## Mod. 3000 AUTO

- **Afilado automatizado**
- **Mayor productividad**
- **Pantalla de configuración LCD**

- Automated Sharpening
- Higher Efficiency
- LCD Setting Screen

- Affûttage automatisée
- Meilleure productivité
- Écran de configuration

| Mod. | Cap. mm | Punta Point Pointe | Uso Use Usage | L mm min. | N° Art. | € |
|---|---|---|---|---|---|---|
| **3000-Auto** | 3-21 | 118°-150° | HSS, HSSE, TIN, MD/HM + Split Point | 50 | 69454* | **Consultar** |

*** Mod. 3000-Auto bajo demanda** / upon request / sur demande

## **PIEZAS RECAMBIO** - Spare Parts - Pieces rechange

**Porta Brocas** - Drill Chucks - Mandrins

| Mod. | Cap. mm | Punta Point Pointe | N° Art. | € |
|---|---|---|---|---|
| **0391** | 3-19 | 118°-140° | 60302 | **Consultar** |
| **3000** | 3-21 | 118°-150° | 60304* | **Consultar** |
| **3000** | 21-30 | 118°-150° | 67155* | **Consultar** |

*** Art. bajo demanda** / upon request / sur demande

**Muela** - Wheel - Meule

| Mod. | K | Cap. mm | N° Art. | € |
|---|---|---|---|---|
| **0391** | **180** | 3-19 | 60303 | **Consultar** |
| **0391** | **Diamante** | 3-19 | 61962* | **Consultar** |
| **3000** | **100** | 3-21 | 60306* | **Consultar** |
| **3000** | **180** | 3-21 | 60305* | **Consultar** |

*** Art. bajo demanda** / upon request / sur demande

# Ref. 9994

## MÁQUINA AFILADORA BROCAS
Drill Bit Sharpening Machine
Machine affûteuse forets

### Mod. XP

| Cap. mm | Punta Point Pointe | Uso Use Usage | Nº Art. | € |
|---|---|---|---|---|
| 2,5-13 | 118° | **HSS, TIN, HSSE, MD / HM** / Carbure, **Pared / Masonry** / Béton + Split Point | 38416 | **165,84** |

**Incluida Muela y medidor de ángulos**
**Wheel & Angle Meter included**
Compris meule et compteur d'angle

✱

### Mod. 500

| Cap. mm | Punta Point Pointe | Uso Use Usage | Nº Art. | € |
|---|---|---|---|---|
| 2,5-13 | 118°-135° | **HSS, TIN, HSSE, MD / HM** / Carbure, **Pared / Masonry** / Béton + Split Point | 45121 | **337,20** |

**Incluida Muela K180 y medidor de ángulos**
**Wheel K180 & Angle Meter included**
Compris meule K180 et compteur d'angle

✱

### Mod. 750

| Cap. mm | Punta Point Pointe | Uso Use Usage | Nº Art. | € |
|---|---|---|---|---|
| 2,5-19 | 115°-140° | **HSS, TIN, HSSE, MD / HM** / Carbure, **Pared / Masonry** / Béton + Split Point | 38418 | **386,09** |

**Incluida Muela K180 y medidor de ángulos**
**Wheel K180 & Angle Meter included**
Compris meule K180 et compteur d'angle

✱

✱ **INSTRUCCIONES USO / Directions for use** / Instructions d´emploi

## **PIEZAS RECAMBIO** - Spare Parts - Pieces rechange

**Porta Brocas** - **Drill Chucks** - Mandrins

| Mod. | Cap. mm | Punta Point Pointe | Nº Art. | € |
|---|---|---|---|---|
| **XP** | 2,5-13 | 118° | 39712 | **76,70** |
| **500** | 2,5-13 | 118°-135° | 47218 | **76,70** |
| **500-750** | 2,5-19 | 115°-140° | 40343 | **107,55** |

**Muela - Wheel** - Meule

| Mod. | Grano Grain | Máquina Machine | Cap. mm | Nº Art. | € |
|---|---|---|---|---|---|
| **K180** | **Fino Fine** Fin | XP-500-750 | 2,5-19 | 40344 | **53,67** |
| **K100** | **Grueso Coarse** Gros | 750 | 13-19 | 43414 | **53,67** |

# 03.

## ESCARIADO
Reaming
Alésage


**ESCARIADORES MÁQUINA**
Machine Reamers
Alésoirs à machine 176

**ESCARIADORES MANO**
Hand Reamers
Alésoirs à main 187

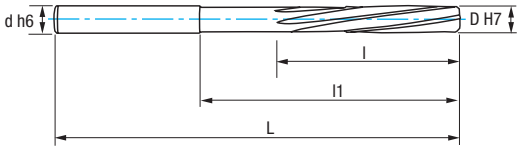

## AVELLANADO
Countersinking-Counterboring
Fraisage


**AVELLANADORES MANGO CILÍNDRICO**
Straight Shank Countersinks-Counterbores
Fraises à noyer 190

**AVELLANADORES MANGO CÓNICO**
Taper Shank Countersinks-Counterbores
Fraises à chambrer 199

# Ref. 9060

## ESCARIADOR MÁQUINA MANGO CILÍNDRICO METAL DURO
Solid Carbide Straight Shank Machine Reamer
Alésoir à machine queue cylindrique carbure




**MD**/HM Carbure Micrograno | ALTIN | DIN 8093-2 | **Tol. Agujero Hole** Trou **H7**

| Material | | Vc (m/min) ALTIN | | Avances f/rev. (mm/rev) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | L | R | Ø2 | Ø4 | Ø6 | Ø8 | Ø10 | Ø12 |
| P | P.1 | 24-30 | 28-36 | 0,060 | 0,100 | 0,100 | 0,120 | 0,150 | 0,180 |
| | P.2 | 14-24 | 16-28 | 0,060 | 0,100 | 0,100 | 0,120 | 0,150 | 0,180 |
| | P.3 | 10-14 | 12-16 | 0,040 | 0,080 | 0,080 | 0,100 | 0,120 | 0,150 |
| | P.4 | 6-10 | 7-12 | 0,030 | 0,040 | 0,060 | 0,080 | 0,080 | 0,100 |
| | P.5 | 7-12 | 8-14 | 0,020 | 0,040 | 0,060 | 0,060 | 0,090 | 0,100 |
| M | | 10-14 | 12-16 | 0,020 | 0,040 | 0,060 | 0,060 | 0,070 | 0,080 |
| K | K.1 | 10-14 | 12-16 | 0,080 | 0,120 | 0,150 | 0,180 | 0,200 | 0,220 |
| | K.2 | 7-12 | 8-14 | 0,070 | 0,100 | 0,120 | 0,150 | 0,180 | 0,180 |
| S | | 18-36 | 20-40 | 0,020 | 0,040 | 0,060 | 0,060 | 0,090 | 0,100 |
| N | N.1 | 24-36 | 28-40 | 0,080 | 0,120 | 0,150 | 0,180 | 0,250 | 0,250 |
| | N.2 | 40-60 | 48-70 | 0,070 | 0,120 | 0,150 | 0,180 | 0,250 | 0,250 |
| | N.3 | 24-70 | 28-84 | 0,070 | 0,120 | 0,150 | 0,180 | 0,250 | 0,250 |
| | N.4 | 24-70 | 28-84 | 0,070 | 0,120 | 0,150 | 0,180 | 0,250 | 0,250 |
| | N.5 | 24-70 | 28-84 | 0,070 | 0,120 | 0,150 | 0,180 | 0,250 | 0,250 |
| | N.6 | 24-42 | 28-50 | 0,050 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 |
| | N.7 | 24-42 | 28-50 | 0,050 | 0,080 | 0,100 | 0,120 | 0,150 | 0,160 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$

New!

### ESCARIADORES CON HÉLICE A DERECHAS

**Para agujeros ciegos se deben utilizar escariadores de hélice a derechas, que expulsan las virutas hacia la parte posterior del escariador. Esto evita que las virutas se acumulen en el fondo del agujero, reduciendo así la posibilidad de dañar el escariador y la pieza de trabajo. El escariador de hélice derecha también ayuda a pasar intersecciones en el orificio, como orificios transversales o chaveteros. Los escariadores de hélice derecha serán también la primera opción para materiales altamente dúctiles.**

### Right Hand Spiral Reamers

Right Hand Spiral Reamers should be used for blind holes. A right hand spiral pulls the swarf towards the back of the Reamer. This stops the swarf from being packed in the bottom of the hole, thus reducing the chance of damaging the Reamer and the work piece. The Right Hand Spiral Reamer also helps to pass interruptions in the hole such as cross holes or keyways. Right Hand Spiral Reamers perform well on highly ductile materials.

### Ébavureurs à spirale droite

Pour les trous borgnes, il est recommandé d'utiliser des ébavureurs à spirale droite qui évacuent les copeaux vers l'arrière de l'ébavureur. Cela empêche l'accumulation de copeaux au fond du trou, réduisant ainsi le risque d'endommager l'ébavureur et la pièce de travail. L'ébavureur à spirale droite facilite également le passage à travers des intersections dans le trou, telles que des trous transversaux ou des rainures. Les ébavureurs à spirale droite seront également le premier choix pour les matériaux hautement ductiles.

| D H7 | d h6 | L mm | l mm | l1 mm | Z | N° Art. ALTIN L | N° Art. ALTIN R (New!) | € |
|---|---|---|---|---|---|---|---|---|
| 1,00 | 3 | 50 | 6 | 22 | 3 | 85040 | 80969 | 42,85 |
| 1,10 | 3 | 50 | 9 | 22 | 3 | 85041 | 75247 | 42,85 |
| 1,20 | 3 | 50 | 9 | 22 | 3 | 85042 | 75248 | 42,85 |
| 1,30 | 3 | 50 | 9 | 22 | 3 | 85043 | 75249 | 42,85 |
| 1,40 | 3 | 50 | 9 | 22 | 3 | 85044 | 75250 | 42,85 |
| 1,50 | 3 | 50 | 9 | 22 | 3 | 85045 | 80970 | 42,85 |
| 1,60 | 3 | 50 | 10 | 22 | 3 | 85046 | 75251 | 42,85 |
| 1,70 | 3 | 50 | 10 | 22 | 4 | 85047 | 75252 | 42,85 |
| 1,80 | 3 | 50 | 11 | 22 | 4 | 85048 | 75253 | 42,85 |
| 1,90 | 3 | 50 | 11 | 22 | 4 | 85049 | 75254 | 42,85 |
| 2,00 | 3 | 50 | 12 | 22 | 4 | 85050 | 80971 | 41,59 |
| 2,10 | 3 | 50 | 12 | 22 | 4 | 85051 | 75255 | 41,59 |
| 2,20 | 3 | 50 | 12 | 22 | 4 | 85052 | 75256 | 41,59 |
| 2,30 | 3 | 50 | 12 | 22 | 4 | 85053 | 75257 | 41,59 |
| 2,40 | 3 | 60 | 16 | 32 | 4 | 85054 | 75258 | 48,40 |
| 2,50 | 3 | 60 | 16 | 32 | 4 | 85055 | 80972 | 48,40 |

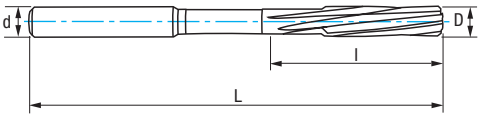
# Ref. 9060

## ESCARIADOR MÁQUINA MANGO CILÍNDRICO METAL DURO
Solid Carbide Straight Shank Machine Reamer
Alésoir à machine queue cylindrique carbure

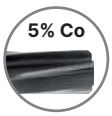
| D H7 | d h6 | L mm | l mm | l1 mm | Z | N° Art. ALTIN L | N° Art. ALTIN R (New!) | € |
|---|---|---|---|---|---|---|---|---|
| 2,60 | 3 | 60 | 16 | 32 | 6 | 85056 | 75259 | 48,40 |
| 2,70 | 3 | 65 | 17 | 37 | 6 | 85057 | 80976 | 48,40 |
| 2,80 | 3 | 65 | 17 | 37 | 6 | 85058 | 75260 | 48,40 |
| 2,90 | 3 | 65 | 17 | 37 | 6 | 85059 | 75261 | 48,40 |
| 3,00 | 3 | 65 | 17 | 37 | 6 | 85060 | 80977 | 48,40 |
| 3,10 | 4 | 65 | 18 | 37 | 6 | 85061 | 75263 | 51,31 |
| 3,20 | 4 | 65 | 18 | 37 | 6 | 85062 | 80978 | 51,31 |
| 3,30 | 4 | 65 | 18 | 37 | 6 | 85063 | 75264 | 51,31 |
| 3,40 | 4 | 75 | 18 | 47 | 6 | 85064 | 75265 | 51,31 |
| 3,50 | 4 | 75 | 18 | 47 | 6 | 85065 | 80979 | 51,31 |
| 3,60 | 4 | 75 | 18 | 47 | 6 | 85066 | 75266 | 51,31 |
| 3,70 | 4 | 75 | 18 | 47 | 6 | 85067 | 75267 | 51,31 |
| 3,80 | 4 | 75 | 19 | 47 | 6 | 85068 | 75268 | 51,32 |
| 3,90 | 4 | 75 | 19 | 47 | 6 | 85069 | 75269 | 51,32 |
| 4,00 | 4 | 75 | 19 | 47 | 6 | 85070 | 80980 | 51,32 |
| 4,10 | 4 | 75 | 19 | 47 | 6 | 85071 | 75270 | 56,72 |
| 4,20 | 4 | 75 | 19 | 47 | 6 | 85072 | 75271 | 56,72 |
| 4,30 | 6 | 80 | 21 | 44 | 6 | 85073 | 75272 | 61,45 |
| 4,40 | 6 | 80 | 21 | 44 | 6 | 85074 | 75273 | 61,45 |
| 4,50 | 6 | 80 | 21 | 44 | 6 | 85075 | 80981 | 61,45 |
| 4,60 | 6 | 80 | 21 | 44 | 6 | 85076 | 75274 | 61,45 |
| 4,70 | 6 | 80 | 21 | 44 | 6 | 85077 | 75275 | 61,45 |
| 4,80 | 6 | 93 | 23 | 57 | 6 | 85078 | 75276 | 64,99 |
| 4,90 | 6 | 93 | 23 | 57 | 6 | 85079 | 75420 | 64,99 |
| 5,00 | 6 | 93 | 23 | 57 | 6 | 85080 | 80856 | 64,99 |
| 5,10 | 6 | 93 | 23 | 57 | 6 | 85081 | 75432 | 68,95 |
| 5,20 | 6 | 93 | 23 | 57 | 6 | 85082 | 75497 | 68,95 |
| 5,30 | 6 | 93 | 23 | 57 | 6 | 85083 | 75526 | 68,95 |
| 5,40 | 6 | 93 | 26 | 57 | 6 | 85084 | 80982 | 71,54 |
| 5,50 | 6 | 93 | 26 | 57 | 6 | 85085 | 80983 | 71,54 |
| 5,60 | 6 | 93 | 26 | 57 | 6 | 85086 | 75549 | 71,54 |
| 5,70 | 6 | 93 | 26 | 57 | 6 | 85087 | 75567 | 71,54 |
| 5,80 | 6 | 93 | 26 | 57 | 6 | 85088 | 75600 | 71,54 |
| 5,90 | 6 | 93 | 26 | 57 | 6 | 85089 | 80984 | 73,73 |
| 6,00 | 6 | 93 | 26 | 57 | 6 | 85090 | 80985 | 73,73 |
| 6,10 | 6 | 101 | 28 | 65 | 6 | 85091 | 75625 | 80,35 |
| 6,20 | 6 | 101 | 28 | 65 | 6 | 85092 | 80986 | 80,35 |
| 6,30 | 6 | 101 | 28 | 65 | 6 | 85093 | 75639 | 80,35 |
| 6,40 | 6 | 101 | 28 | 65 | 6 | 85094 | 75642 | 80,35 |
| 6,50 | 6 | 101 | 28 | 65 | 6 | 85095 | 80988 | 80,35 |
| 6,60 | 6 | 101 | 28 | 65 | 6 | 85096 | 75668 | 80,35 |
| 6,70 | 6 | 101 | 28 | 65 | 6 | 85097 | 75673 | 80,35 |
| 6,80 | 8 | 109 | 31 | 73 | 6 | 85098 | 75753 | 80,36 |
| 6,90 | 8 | 109 | 31 | 73 | 6 | 85099 | 75764 | 80,36 |
| 7,00 | 8 | 109 | 31 | 73 | 6 | 85100 | 80989 | 90,59 |
| 7,10 | 8 | 109 | 31 | 73 | 6 | 85101 | 75881 | 90,59 |
| 7,20 | 8 | 109 | 31 | 73 | 6 | 85102 | 75885 | 90,59 |
| 7,30 | 8 | 109 | 31 | 73 | 6 | 85103 | 75895 | 90,59 |
| 7,40 | 8 | 109 | 31 | 73 | 6 | 85104 | 75899 | 90,59 |
| 7,50 | 8 | 109 | 31 | 73 | 6 | 85105 | 75901 | 90,59 |
| 7,60 | 8 | 117 | 33 | 81 | 6 | 85106 | 75903 | 96,11 |
| 7,70 | 8 | 117 | 33 | 81 | 6 | 85107 | 75907 | 96,11 |
| 7,80 | 8 | 117 | 33 | 81 | 6 | 85108 | 75908 | 96,11 |
| 7,90 | 8 | 117 | 33 | 81 | 6 | 85109 | 75915 | 96,11 |
| 8,00 | 8 | 117 | 33 | 81 | 6 | 85110 | 80990 | 96,11 |
| 8,10 | 8 | 117 | 33 | 77 | 6 | 85113 | 75944 | 102,09 |
| 8,20 | 8 | 117 | 33 | 77 | 6 | 85114 | 80991 | 102,09 |
| 8,30 | 8 | 117 | 33 | 77 | 6 | 85116 | 75976 | 102,09 |
| 8,40 | 8 | 117 | 33 | 77 | 6 | 85117 | 76002 | 102,09 |
| 8,50 | 8 | 117 | 33 | 77 | 6 | 85118 | 80992 | 102,09 |
| 8,60 | 10 | 125 | 36 | 85 | 6 | 85119 | 76012 | 111,93 |
| 8,70 | 10 | 125 | 36 | 85 | 6 | 85120 | 76064 | 111,93 |
| 8,80 | 10 | 125 | 36 | 85 | 6 | 85121 | 76113 | 111,93 |
| 8,90 | 10 | 125 | 36 | 85 | 6 | 85122 | 76132 | 111,93 |
| 9,00 | 10 | 125 | 36 | 85 | 6 | 85123 | 80993 | 111,93 |
| 9,10 | 10 | 125 | 36 | 85 | 6 | 85125 | 76133 | 118,25 |
| 9,20 | 10 | 125 | 36 | 85 | 6 | 85126 | 76134 | 118,25 |
| 9,30 | 10 | 125 | 36 | 85 | 6 | 85127 | 76137 | 118,25 |
| 9,40 | 10 | 125 | 36 | 85 | 6 | 85128 | 76150 | 118,25 |
| 9,50 | 10 | 125 | 36 | 85 | 6 | 85129 | 76186 | 118,25 |
| 9,60 | 10 | 133 | 38 | 93 | 6 | 85130 | 76190 | 127,19 |
| 9,70 | 10 | 133 | 38 | 93 | 6 | 85131 | 76194 | 127,19 |
| 9,80 | 10 | 133 | 38 | 93 | 6 | 85132 | 76347 | 127,19 |
| 9,90 | 10 | 133 | 38 | 93 | 6 | 85133 | 76378 | 127,19 |
| 10,00 | 10 | 133 | 38 | 93 | 6 | 85134 | 80994 | 127,19 |
| 10,10 | 10 | 133 | 38 | 93 | 6 | 85135 | 76379 | 140,94 |
| 10,20 | 10 | 133 | 38 | 93 | 6 | 85136 | 76381 | 140,94 |
| 10,30 | 10 | 133 | 38 | 93 | 6 | 85137 | 76460 | 140,94 |
| 10,40 | 10 | 133 | 38 | 93 | 6 | 85138 | 76504 | 140,94 |
| 10,50 | 10 | 133 | 38 | 93 | 6 | 85139 | 76562 | 140,94 |
| 10,60 | 10 | 133 | 38 | 93 | 6 | 85140 | 76569 | 140,94 |
| 10,70 | 10 | 142 | 41 | 102 | 6 | 85141 | 76577 | 140,94 |
| 10,80 | 10 | 142 | 41 | 102 | 6 | 85142 | 76581 | 140,94 |
| 10,90 | 10 | 142 | 41 | 102 | 6 | 85143 | 76583 | 140,94 |
| 11,00 | 10 | 142 | 41 | 102 | 6 | 85144 | 80995 | 155,03 |
| 11,10 | 10 | 142 | 41 | 102 | 6 | 85145 | 76584 | 200,41 |
| 11,20 | 10 | 142 | 41 | 102 | 6 | 85146 | 76585 | 200,41 |
| 11,30 | 10 | 142 | 41 | 102 | 6 | 85147 | 76587 | 200,41 |
| 11,40 | 10 | 142 | 41 | 102 | 6 | 85148 | 76591 | 203,33 |
| 11,50 | 10 | 142 | 41 | 102 | 6 | 85149 | 76769 | 203,33 |
| 11,60 | 10 | 142 | 41 | 102 | 6 | 85150 | 76793 | 203,33 |
| 11,70 | 10 | 142 | 41 | 102 | 6 | 85151 | 76802 | 203,33 |
| 11,80 | 10 | 142 | 41 | 102 | 6 | 85152 | 76814 | 203,33 |
| 11,90 | 12 | 151 | 44 | 106 | 6 | 85153 | 76821 | 203,33 |
| 12,00 | 12 | 151 | 44 | 106 | 6 | 85154 | 80996 | 203,33 |
| 12,50 | 12 | 151 | 44 | 106 | 8 | 85159 | 77196 | 231,87 |
| 13,00 | 12 | 151 | 44 | 106 | 8 | 85164 | 80997 | 231,87 |
| 13,50 | 16 | 160 | 47 | 112 | 8 | 85165 | 77278 | 293,43 |
| 14,00 | 16 | 160 | 47 | 112 | 8 | 85166 | 80999 | 293,43 |
| 14,50 | 16 | 162 | 50 | 114 | 8 | 85167 | 77282 | 326,70 |
| 15,00 | 16 | 162 | 50 | 114 | 8 | 85168 | 77284 | 326,70 |
| 15,50 | 16 | 170 | 52 | 122 | 8 | 85169 | 77285 | 327,70 |
| 16,00 | 16 | 170 | 52 | 122 | 8 | 85170 | 81000 | 381,91 |
| 16,50 | 18 | 175 | 52 | 127 | 8 | 85171 | 77290 | 442,41 |
| 17,00 | 18 | 175 | 52 | 127 | 8 | 85172 | 77296 | 442,41 |
| 17,50 | 18 | 182 | 52 | 134 | 8 | 85173 | 77297 | 493,08 |
| 18,00 | 18 | 182 | 52 | 134 | 8 | 85174 | 81001 | 493,08 |
| 18,50 | 20 | 189 | 52 | 139 | 8 | 85175 | 77298 | 554,33 |
| 19,00 | 20 | 189 | 52 | 139 | 8 | 85176 | 77299 | 554,33 |
| 19,50 | 20 | 195 | 52 | 145 | 8 | 85177 | 77300 | 631,47 |
| 20,00 | 20 | 195 | 52 | 145 | 8 | 85178 | 77302 | 631,47 |

# Ref. 2060

## ESCARIADOR MÁQUINA MANGO CILÍNDRICO HSSE
HSSE Straight Shank Machine Reamer
Alésoir à machine queue cylindrique HSSE




HSSE 5% Co | HSSE 5% Co + TIALSIN | D ≤ 2,70 DIN 212 B | D ≥ 2,80 DIN 212 D | ISO 521 | **Tol. Agujero Hole** Trou H7



x3,5 **Resistencia al desgaste** Wear Resistance Résistant à l'usure

Video

| Material | | Vc (m/min) | | Avances f/rev. (mm/rev) - Feed - Pas | | | | | ø Previo mm Previous ø Précédent | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | TIALSIN | Ø 4 | Ø 6 | Ø 10 | Ø 16 | Ø 20 | < 5 | 5-10 | 10-18 | 18-20 |
| P | P.1 | 8-12 | 9-14 | 0,080 | 0,120 | 0,180 | 0,250 | 0,300 | 0,2 | 0,2 | 0,2-0,3 | 0,3 |
| | P.2 | 6-8 | 7-9 | 0,080 | 0,100 | 0,120 | 0,200 | 0,220 | 0,2 | 0,2 | 0,2 | 0,3 |
| | P.3 | 4-6 | 5-7 | 0,080 | 0,100 | 0,120 | 0,160 | 0,200 | 0,2 | 0,2 | 0,2 | 0,3 |
| | P.5 | 4-6 | 5-7 | 0,080 | 0,100 | 0,120 | 0,160 | 0,200 | 0,2 | 0,2 | 0,2 | 0,3 |
| N | N.3 | 15-30 | 17-34 | 0,120 | 0,160 | 0,200 | 0,250 | 0,300 | 0,2 | 0,3 | 0,3-0,4 | 0,3-0,5 |
| | N.4 | 15-30 | 17-34 | 0,120 | 0,160 | 0,200 | 0,250 | 0,300 | 0,2 | 0,3 | 0,3-0,4 | 0,3-0,5 |
| | N.5 | 8-10 | 9-11 | 0,120 | 0,160 | 0,200 | 0,250 | 0,300 | 0,2 | 0,3 | 0,3-0,4 | 0,3-0,5 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | d mm | L mm | l mm | Z | N° Art. 5% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **2,00** | 2,00 | 49 | 11 | 4 | 74421 | **17,41** | 56499 | **34,99** |
| **2,10** | 2,10 | 49 | 11 | 4 | 20699 | **19,16** | 20795 | **36,68** |
| **2,20** | 2,20 | 53 | 12 | 4 | 20700 | **19,16** | 20796 | **36,68** |
| **2,30** | 2,30 | 53 | 12 | 4 | 20701 | **19,16** | 20797 | **36,68** |
| **2,40** | 2,40 | 57 | 14 | 4 | 19768 | **19,16** | 20798 | **36,68** |
| **2,50** | 2,50 | 57 | 14 | 4 | 74424 | **17,41** | 56502 | **34,99** |
| **2,60** | 2,60 | 57 | 14 | 4 | 19769 | **19,16** | 20799 | **36,68** |
| **2,70** | 2,70 | 61 | 15 | 4 | 20702 | **19,16** | 20800 | **36,68** |
| **2,80** | 2,80 | 61 | 15 | 4 | 20703 | **19,16** | 20801 | **36,68** |
| **2,90** | 2,90 | 61 | 15 | 4 | 20704 | **19,16** | 20802 | **36,68** |
| **3,00** | 3,00 | 61 | 15 | 6 | 74427 | **17,41** | 56505 | **34,99** |
| **3,10** | 3,10 | 65 | 16 | 6 | 20705 | **19,16** | 20803 | **38,24** |
| **3,20** | 3,20 | 65 | 16 | 6 | 20706 | **19,16** | 20805 | **38,24** |
| **3,30** | 3,30 | 65 | 16 | 6 | 19771 | **19,16** | 20806 | **38,24** |
| **3,40** | 3,40 | 70 | 18 | 6 | 20707 | **19,16** | 20807 | **38,24** |
| **3,50** | 3,50 | 70 | 18 | 6 | 74430 | **17,41** | 56508 | **36,58** |
| **3,60** | 3,60 | 70 | 18 | 6 | 20709 | **19,16** | 20808 | **38,24** |
| **3,70** | 3,70 | 70 | 18 | 6 | 20710 | **19,16** | 20809 | **38,24** |
| **3,80** | 4,00 | 75 | 19 | 6 | 20711 | **19,16** | 20810 | **38,24** |
| **3,90** | 4,00 | 75 | 19 | 6 | 20712 | **19,16** | 20811 | **38,24** |
| **4,00** | 4,00 | 75 | 19 | 6 | 74433 | **17,41** | 56511 | **36,58** |
| **4,10** | 4,00 | 75 | 19 | 6 | 20713 | **19,16** | 20812 | **39,84** |
| **4,20** | 4,00 | 75 | 19 | 6 | 80961 | **19,16** | 20814 | **39,84** |
| **4,30** | 4,50 | 80 | 21 | 6 | 20714 | **19,16** | 20815 | **39,84** |
| **4,40** | 4,50 | 80 | 21 | 6 | 45603 | **19,16** | 20816 | **39,84** |
| **4,50** | 4,50 | 80 | 21 | 6 | 75363 | **17,41** | 56514 | **38,17** |
| **4,60** | 4,50 | 80 | 21 | 6 | 20715 | **19,16** | 20817 | **39,84** |
| **4,70** | 4,50 | 80 | 21 | 6 | 80962 | **19,16** | 20818 | **39,84** |
| **4,80** | 5,00 | 86 | 23 | 6 | 20716 | **19,16** | 20819 | **39,84** |
| **4,90** | 5,00 | 86 | 23 | 6 | 20717 | **19,16** | 20820 | **39,84** |

| D mm | d mm | L mm | l mm | Z | N° Art. 5% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **5,00** | 5,00 | 86 | 23 | 6 | 26989 | **17,41** | 10587 | **38,17** |
| **5,10** | 5,00 | 86 | 23 | 6 | 20718 | **19,16** | 20821 | **40,77** |
| **5,20** | 5,00 | 86 | 23 | 6 | 80963 | **19,16** | 20822 | **40,77** |
| **5,30** | 5,00 | 86 | 23 | 6 | 20719 | **19,16** | 20823 | **40,77** |
| **5,40** | 5,60 | 93 | 26 | 6 | 20721 | **19,16** | 20824 | **40,77** |
| **5,50** | 5,60 | 93 | 26 | 6 | 75364 | **17,41** | 56517 | **39,10** |
| **5,60** | 5,60 | 93 | 26 | 6 | 20724 | **20,98** | 20825 | **42,51** |
| **5,70** | 5,60 | 93 | 26 | 6 | 80964 | **20,98** | 20826 | **42,51** |
| **5,80** | 5,60 | 93 | 26 | 6 | 20725 | **20,98** | 20827 | **42,51** |
| **5,90** | 5,60 | 93 | 26 | 6 | 20726 | **20,98** | 20828 | **42,51** |
| **6,00** | 5,60 | 93 | 26 | 6 | 74436 | **19,08** | 56520 | **40,65** |
| **6,10** | 6,30 | 101 | 28 | 6 | 20727 | **20,98** | 20829 | **44,08** |
| **6,20** | 6,30 | 101 | 28 | 6 | 20728 | **20,98** | 20830 | **44,08** |
| **6,30** | 6,30 | 101 | 28 | 6 | 20729 | **20,98** | 20832 | **44,08** |
| **6,40** | 6,30 | 101 | 28 | 6 | 20730 | **20,98** | 20833 | **44,08** |
| **6,50** | 6,30 | 101 | 28 | 6 | 74439 | **19,08** | 56523 | **42,26** |
| **6,60** | 6,30 | 101 | 28 | 6 | 20731 | **20,98** | 20835 | **44,08** |
| **6,70** | 6,30 | 101 | 28 | 6 | 20732 | **20,98** | 20836 | **44,08** |
| **6,80** | 7,10 | 101 | 28 | 6 | 20733 | **20,98** | 20837 | **44,08** |
| **6,90** | 7,10 | 101 | 28 | 6 | 20734 | **20,98** | 20838 | **44,08** |
| **7,00** | 7,10 | 109 | 31 | 6 | 74442 | **19,08** | 56526 | **42,26** |
| **7,10** | 7,10 | 109 | 31 | 6 | 20735 | **22,76** | 20839 | **47,61** |
| **7,20** | 7,10 | 109 | 31 | 6 | 20736 | **22,76** | 20841 | **47,61** |
| **7,30** | 7,10 | 109 | 31 | 6 | 20737 | **22,76** | 20842 | **47,61** |
| **7,40** | 7,10 | 109 | 31 | 6 | 20739 | **22,76** | 20844 | **47,61** |
| **7,50** | 7,10 | 109 | 31 | 6 | 74445 | **20,70** | 56529 | **45,61** |
| **7,60** | 8,00 | 117 | 33 | 6 | 20745 | **22,76** | 20845 | **47,61** |
| **7,70** | 8,00 | 117 | 33 | 6 | 20747 | **22,76** | 20847 | **47,61** |
| **7,80** | 8,00 | 117 | 33 | 6 | 20748 | **22,76** | 20848 | **47,61** |
| **7,90** | 8,00 | 117 | 33 | 6 | 20749 | **22,76** | 20849 | **47,61** |

# Ref. 2060

## ESCARIADOR MÁQUINA MANGO CILÍNDRICO HSSE
HSSE Straight Shank Machine Reamer
Alésoir à machine queue cylindrique HSSE

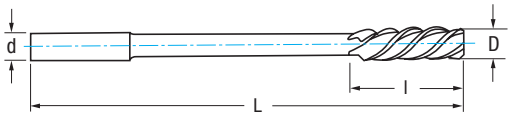
| D mm | d mm | L mm | l mm | Z | N° Art. 5% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **8,00** | 8,00 | 117 | 33 | 6 | 74448 | **21,08** | 56532 | **45,99** |
| **8,10** | 8,00 | 117 | 33 | 6 | 20751 | **25,37** | 20850 | **52,58** |
| **8,20** | 8,00 | 117 | 33 | 6 | 20753 | **25,37** | 20851 | **52,58** |
| **8,30** | 8,00 | 117 | 33 | 6 | 20754 | **25,37** | 20852 | **52,58** |
| **8,40** | 8,00 | 117 | 33 | 6 | 20755 | **25,37** | 20853 | **52,58** |
| **8,50** | 8,00 | 117 | 33 | 6 | 74451 | **23,05** | 56535 | **50,37** |
| **8,60** | 9,00 | 125 | 36 | 6 | 20757 | **27,92** | 20854 | **55,01** |
| **8,70** | 9,00 | 125 | 36 | 6 | 20758 | **27,92** | 20856 | **55,01** |
| **8,80** | 9,00 | 125 | 36 | 6 | 20760 | **27,92** | 20857 | **55,01** |
| **8,90** | 9,00 | 125 | 36 | 6 | 20761 | **27,92** | 20859 | **55,01** |
| **9,00** | 9,00 | 125 | 36 | 6 | 74930 | **25,41** | 56538 | **52,62** |
| **9,10** | 9,00 | 125 | 36 | 6 | 20763 | **27,92** | 20860 | **56,18** |
| **9,20** | 9,00 | 125 | 36 | 6 | 20764 | **27,92** | 20861 | **56,18** |
| **9,30** | 9,00 | 125 | 36 | 6 | 20765 | **27,92** | 20862 | **56,18** |
| **9,40** | 9,00 | 125 | 36 | 6 | 20766 | **27,92** | 20863 | **56,18** |
| **9,50** | 9,00 | 125 | 36 | 6 | 74454 | **25,79** | 56541 | **54,12** |

| D mm | d mm | L mm | l mm | Z | N° Art. 5% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **9,60** | 10,00 | 133 | 38 | 6 | 20767 | **27,92** | 20864 | **56,18** |
| **9,70** | 10,00 | 133 | 38 | 6 | 20768 | **27,92** | 20865 | **56,18** |
| **9,80** | 10,00 | 133 | 38 | 6 | 20769 | **27,92** | 20866 | **56,18** |
| **9,90** | 10,00 | 133 | 38 | 6 | 20770 | **27,92** | 20868 | **56,18** |
| **10,00** | 10,00 | 133 | 38 | 6 | 74933 | **25,79** | 56544 | **54,12** |
| **11,00** | 10,00 | 142 | 41 | 6 | 74934 | **30,47** | 56547 | **61,08** |
| **12,00** | 10,00 | 151 | 44 | 6 | 74457 | **29,78** | 56550 | **60,40** |
| **13,00** | 10,00 | 151 | 44 | 8 | 74460 | **51,20** | 56553 | **83,83** |
| **14,00** | 12,50 | 160 | 47 | 8 | 74463 | **48,97** | 56556 | **81,67** |
| **15,00** | 12,50 | 162 | 50 | 8 | 74466 | **53,45** | 56559 | **90,07** |
| **16,00** | 12,50 | 170 | 52 | 8 | 75160 | **57,18** | 56562 | **93,64** |
| **17,00** | 14,00 | 175 | 54 | 8 | 74469 | **65,98** | 56565 | **108,83** |
| **18,00** | 14,00 | 182 | 56 | 8 | 74935 | **68,82** | 56568 | **111,54** |
| **19,00** | 16,00 | 189 | 58 | 8 | 74472 | **73,13** | 56571 | **119,72** |
| **20,00** | 16,00 | 195 | 60 | 8 | 74475 | **73,59** | 56574 | **120,17** |

**Recubrimiento TIALSIN / ø centesimales bajo demanda**
**TIALSIN Coating / Centesimal ø-s upon request**
Revêtement TIALSIN / ø centièmes sur demande

# Ref. 2064

## ESCARIADOR MÁQUINA MANGO CILÍNDRICO GAMMON HSSE
Gammon HSSE Straight Shank Machine Reamer
Alesoir à machine queue cylindrique HSSE gammon




HSSE 5% Co | Gammon | DIN 212 E | ISO 521 | 45° | **Tol. Agujero Hole** Trou H7

| Material Grupo | Sub. | Vc (m/min) 5% Co | Avances f/rev. (mm/rev) - Feed - Pas Ø 4 | Ø 6 | Ø 10 | Ø 16 | ø Previo mm Previous ø Précédent < 5 | 5-10 | 10-16 |
|---|---|---|---|---|---|---|---|---|---|
| P | P.1 | 8-12 | 0,080 | 0,120 | 0,180 | 0,250 | 0,2 | 0,2 | 0,2-0,3 |
| | P.2 | 6-8 | 0,080 | 0,100 | 0,120 | 0,200 | 0,2 | 0,2 | 0,2 |
| M | | 3-5 | 0,080 | 0,100 | 0,120 | 0,160 | 0,2 | 0,2 | 0,2 |
| K | K.1 | 8-12 | 0,080 | 0,100 | 0,120 | 0,160 | 0,2 | 0,2 | 0,2-0,3 |
| | K.2 | 4-8 | 0,120 | 0,160 | 0,200 | 0,250 | 0,2 | 0,2 | 0,2-0,3 |
| S | | 3-5 | 0,060 | 0,100 | 0,140 | 0,180 | 0,2 | 0,2 | 0,3 |
| N | N.1 | 8-15 | 0,080 | 0,100 | 0,120 | 0,160 | 0,2 | 0,2 | 0,2-0,3 |
| | N.2 | 15-20 | 0,120 | 0,160 | 0,200 | 0,250 | 0,2 | 0,2 | 0,2-0,3 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x f**

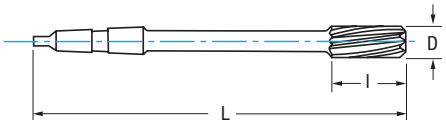
*** Se puede aumentar el avance hasta un 50%**
*** It is possible to grow feed up to 50%**
* On peut augmenter l'avance jusqu'à un 50%

| D mm | d mm | L mm | l mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|
| **3,00** | 3,00 | 61 | 15 | 3 | 40898 | **23,87** |
| **3,50** | 3,50 | 70 | 18 | 3 | 40901 | **23,87** |
| **4,00** | 4,00 | 75 | 19 | 3 | 40904 | **23,87** |
| **4,50** | 4,50 | 80 | 21 | 3 | 40907 | **24,28** |
| **5,00** | 5,00 | 86 | 23 | 3 | 40910 | **24,28** |
| **5,50** | 5,60 | 93 | 26 | 3 | 40913 | **35,36** |
| **6,00** | 5,60 | 93 | 26 | 3 | 40916 | **24,28** |
| **6,50** | 6,30 | 101 | 28 | 3 | 40919 | **36,05** |
| **7,00** | 7,10 | 109 | 31 | 3 | 40922 | **24,75** |
| **7,50** | 7,10 | 109 | 31 | 3 | 40925 | **36,69** |
| **8,00** | 8,00 | 117 | 33 | 3 | 40928 | **25,19** |
| **8,50** | 8,00 | 117 | 33 | 3 | 40931 | **38,95** |
| **9,00** | 9,00 | 125 | 36 | 3 | 40934 | **26,76** |
| **9,50** | 9,00 | 125 | 36 | 3 | 40937 | **40,55** |
| **10,00** | 10,00 | 133 | 38 | 3 | 40940 | **27,84** |
| **11,00** | 10,00 | 142 | 41 | 3 | 40946 | **34,81** |
| **12,00** | 10,00 | 151 | 44 | 4 | 40952 | **36,27** |
| **13,00** | 10,00 | 151 | 44 | 4 | 40958 | **46,59** |
| **14,00** | 12,50 | 160 | 47 | 4 | 40964 | **50,10** |
| **15,00** | 12,50 | 162 | 50 | 4 | 40970 | **67,33** |
| **16,00** | 12,50 | 170 | 52 | 4 | 40976 | **73,31** |

**Recubrimiento TIALSIN bajo demanda**
**TIALSIN Coating upon request**
Revêtement TIALSIN sur demande

# Ref. 2160

## ESCARIADOR MÁQUINA MANGO CÓNICO HSSE
HSSE Morse Taper Shank Machine Reamer
Alésoir à machine pour alésage queue cône morse HSSE




HSSE 5% Co | DIN 208 B | ISO 521 | **Tol. Agujero** **Hole** Trou H7

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | ø Previo mm Previous ø Précédent | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 4 | Ø 6 | Ø 10 | Ø 16 | Ø 20 | Ø 25 | Ø 30 | < 5 | 5-10 | 10-18 | 18-30 |
| P | P.1 | 8-12 | 0,080 | 0,120 | 0,180 | 0,250 | 0,300 | 0,350 | 0,400 | 0,2 | 0,2 | 0,2-0,3 | 0,3 |
| | P.2 | 6-8 | 0,080 | 0,100 | 0,120 | 0,200 | 0,220 | 0,250 | 0,350 | 0,2 | 0,2 | 0,2 | 0,3 |
| | P.3 | 4-6 | 0,080 | 0,100 | 0,120 | 0,160 | 0,200 | 0,240 | 0,300 | 0,2 | 0,2 | 0,2 | 0,3 |
| | P.5 | 4-6 | 0,080 | 0,100 | 0,120 | 0,160 | 0,200 | 0,240 | 0,300 | 0,2 | 0,2 | 0,2 | 0,3 |
| N | N.3 | 15-30 | 0,120 | 0,160 | 0,200 | 0,250 | 0,300 | 0,400 | 0,500 | 0,2 | 0,3 | 0,3-0,4 | 0,3-0,5 |
| | N.4 | 15-30 | 0,120 | 0,160 | 0,200 | 0,250 | 0,300 | 0,400 | 0,500 | 0,2 | 0,3 | 0,3-0,4 | 0,3-0,5 |
| | N.5 | 8-10 | 0,120 | 0,160 | 0,200 | 0,250 | 0,300 | 0,400 | 0,500 | 0,2 | 0,3 | 0,3-0,4 | 0,3-0,5 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | L mm | l mm | CM | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|
| **4,00** | 129 | 19 | 1 | 6 | 75354 | **51,13** |
| **5,00** | 133 | 23 | 1 | 6 | 75155 | **37,05** |
| **5,50** | 138 | 26 | 1 | 6 | 75345 | **39,82** |
| **6,00** | 138 | 26 | 1 | 6 | 75156 | **37,55** |
| **6,50** | 144 | 28 | 1 | 6 | 75220 | **40,60** |
| **7,00** | 150 | 31 | 1 | 6 | 75352 | **38,24** |
| **7,50** | 150 | 31 | 1 | 6 | 75346 | **41,49** |
| **8,00** | 156 | 33 | 1 | 6 | 61043 | **39,15** |
| **8,50** | 156 | 33 | 1 | 6 | 75159 | **44,02** |
| **9,00** | 162 | 36 | 1 | 6 | 75347 | **41,88** |
| **9,50** | 162 | 36 | 1 | 6 | 75348 | **44,45** |
| **10,00** | 168 | 38 | 1 | 6 | 74481 | **39,69** |
| **10,50** | 168 | 38 | 1 | 6 | 74915 | **45,02** |
| **11,00** | 175 | 41 | 1 | 6 | 74484 | **40,20** |
| **11,50** | 175 | 41 | 1 | 6 | 75221 | **47,39** |
| **12,00** | 182 | 44 | 1 | 6 | 75049 | **40,99** |
| **12,50** | 182 | 44 | 1 | 8 | 74487 | **55,61** |
| **13,00** | 182 | 44 | 1 | 8 | 74490 | **52,80** |
| **13,50** | 189 | 47 | 1 | 8 | 75222 | **57,31** |

| D mm | L mm | l mm | CM | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|
| **14,00** | 189 | 47 | 1 | 8 | 75029 | **54,25** |
| **14,50** | 204 | 50 | 2 | 8 | 75117 | **60,35** |
| **15,00** | 204 | 50 | 2 | 8 | 75157 | **55,86** |
| **15,50** | 210 | 52 | 2 | 8 | 75353 | **63,35** |
| **16,00** | 210 | 52 | 2 | 8 | 74493 | **60,88** |
| **16,50** | 214 | 54 | 2 | 8 | 74496 | **70,44** |
| **17,00** | 214 | 54 | 2 | 8 | 74499 | **67,88** |
| **18,00** | 219 | 56 | 2 | 8 | 74502 | **72,26** |
| **19,00** | 223 | 58 | 2 | 8 | 74508 | **75,68** |
| **20,00** | 228 | 60 | 2 | 8 | 74970 | **78,54** |
| **21,00** | 232 | 62 | 2 | 8 | 74511 | **97,46** |
| **22,00** | 237 | 64 | 2 | 8 | 75118 | **103,64** |
| **23,00** | 241 | 66 | 2 | 8 | 74514 | **108,28** |
| **24,00** | 268 | 68 | 2 | 10 | 74517 | **131,25** |
| **25,00** | 268 | 68 | 2 | 10 | 74520 | **133,72** |
| **26,00** | 273 | 70 | 3 | 10 | 74523 | **140,17** |
| **27,00** | 277 | 71 | 3 | 10 | 74526 | **161,34** |
| **28,00** | 277 | 71 | 3 | 10 | 74529 | **161,34** |
| **30,00** | 281 | 73 | 3 | 10 | 74532 | **175,71** |

**Recubrimiento TIALSIN bajo demanda**
**TIALSIN Coating upon request**
Revêtement TIALSIN sur demande

# Ref. 2164

## ESCARIADOR MÁQUINA MANGO CÓNICO HSSE GAMMON
Gammon HSSE Morse Taper Shank Machine Reamer
Alésoir à machine queue cône morse HSSE gammon

HSSE 5% Co | Gammon | DIN 208 C | ISO 521 | 45° | **Tol. Agujero** **Hole** Trou H7

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | ø Previo mm Previous ø Précédent | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 4 | Ø 6 | Ø 10 | Ø 16 | Ø 20 | Ø 25 | Ø 30 | < 5 | 5-10 | 10-18 | 18-30 |
| P | P.1 | 8-12 | 0,080 | 0,120 | 0,180 | 0,250 | 0,300 | 0,350 | 0,400 | 0,2 | 0,2 | 0,2-0,3 | 0,3 |
| | P.2 | 6-8 | 0,080 | 0,100 | 0,120 | 0,200 | 0,220 | 0,250 | 0,350 | 0,2 | 0,2 | 0,2 | 0,3 |
| M | | 3-5 | 0,080 | 0,100 | 0,120 | 0,160 | 0,200 | 0,240 | 0,300 | 0,2 | 0,2 | 0,2 | 0,3 |
| K | K.1 | 8-12 | 0,080 | 0,100 | 0,120 | 0,160 | 0,200 | 0,240 | 0,300 | 0,2 | 0,2 | 0,2-0,3 | 0,3-0,4 |
| | K.2 | 4-8 | 0,120 | 0,160 | 0,200 | 0,250 | 0,300 | 0,400 | 0,500 | 0,2 | 0,2 | 0,2-0,3 | 0,3-0,4 |
| S | | 3-5 | 0,060 | 0,100 | 0,140 | 0,180 | 0,220 | 0,300 | 0,350 | 0,2 | 0,2 | 0,3 | 0,3-0,4 |
| N | N.1 | 8-15 | 0,080 | 0,100 | 0,120 | 0,160 | 0,200 | 0,240 | 0,300 | 0,2 | 0,2 | 0,2-0,3 | 0,3 |
| | N.2 | 15-20 | 0,120 | 0,160 | 0,200 | 0,250 | 0,300 | 0,400 | 0,500 | 0,2 | 0,2 | 0,2-0,3 | 0,3 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x f**

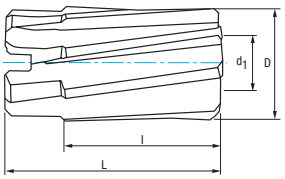
*** Se puede aumentar el avance hasta un 50%**
*** It is possible to grow feed up to 50%**
* On peut augmenter l'avance jusqu'à un 50%

| D mm | L mm | l mm | CM | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|
| **5,00** | 133 | 23 | 1 | 3 | 41306 | **59,70** |
| **6,00** | 138 | 26 | 1 | 3 | 41312 | **59,70** |
| **7,00** | 150 | 31 | 1 | 3 | 41318 | **59,70** |
| **8,00** | 156 | 33 | 1 | 3 | 41324 | **59,70** |
| **9,00** | 162 | 36 | 1 | 3 | 41330 | **57,50** |
| **10,00** | 168 | 38 | 1 | 4 | 41336 | **57,50** |
| **11,00** | 175 | 41 | 1 | 4 | 41342 | **60,05** |
| **12,00** | 182 | 44 | 1 | 4 | 41348 | **60,05** |
| **13,00** | 182 | 44 | 1 | 4 | 41354 | **89,33** |
| **14,00** | 189 | 47 | 1 | 4 | 41360 | **92,09** |
| **15,00** | 204 | 50 | 2 | 4 | 41366 | **100,87** |
| **16,00** | 210 | 52 | 2 | 4 | 41372 | **105,70** |
| **17,00** | 214 | 54 | 2 | 4 | 61070 | **114,44** |
| **18,00** | 219 | 56 | 2 | 4 | 61073 | **121,56** |
| **19,00** | 223 | 58 | 2 | 4 | 74535 | **128,95** |
| **20,00** | 228 | 60 | 2 | 4 | 74538 | **135,54** |
| **21,00** | 232 | 62 | 2 | 4 | 61076 | **146,51** |
| **22,00** | 237 | 64 | 2 | 4 | 74541 | **156,35** |
| **23,00** | 241 | 66 | 2 | 4 | 61079 | **167,67** |
| **24,00** | 268 | 68 | 3 | 4 | 61082 | **176,89** |
| **25,00** | 268 | 68 | 3 | 4 | 75218 | **187,76** |
| **26,00** | 273 | 70 | 3 | 6 | 75224 | **198,15** |
| **28,00** | 277 | 71 | 3 | 6 | 74544 | **219,05** |
| **30,00** | 281 | 73 | 3 | 6 | 74547 | **230,52** |

**Recubrimiento TIALSIN bajo demanda**
**TIALSIN Coating upon request**
Revêtement TIALSIN sur demande

# Ref. 2310

## ESCARIADOR MÁQUINA HUECO HSSE
HSSE Hole Machine Reamer
Alésoir creux finisseur à machine HSSE




| HSSE 5% Co | DIN 219 B | d1=1:30 | ISO 2402 | **Helicoidal 9°** **9° Twist H.** Hélicoïdal 9° | **Tol. Agujero** **Hole** Trou H7 |
|---|---|---|---|---|---|

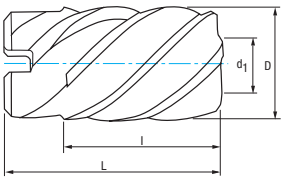
| **Material** | | **Vc** (m/min) | **Avances f/rev.** (mm/rev) - Feed - Pas | | | **ø Previo mm** Previous ø Précédent | |
|---|---|---|---|---|---|---|---|
| **Grupo** | **Sub.** | **5% Co** | **Ø 25** | **Ø 40** | **Ø 63** | **18-30** | **> 30** |
| **P** | **P.1** | 8-12 | 0,350 | 0,400 | 0,500 | 0,3 | 0,4 |
| | **P.2** | 6-8 | 0,250 | 0,350 | 0,450 | 0,3 | 0,4 |
| | **P.3** | 4-6 | 0,240 | 0,300 | 0,400 | 0,3 | 0,3-0,4 |
| | **P.5** | 4-6 | 0,240 | 0,300 | 0,400 | 0,3 | 0,3 |
| **N** | **N.3** | 15-30 | 0,400 | 0,500 | 0,600 | 0,3-0,5 | 0,4-0,6 |
| | **N.4** | 15-30 | 0,400 | 0,500 | 0,600 | 0,3-0,5 | 0,4-0,6 |
| | **N.5** | 8-10 | 0,400 | 0,500 | 0,600 | 0,3-0,5 | 0,4-0,6 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø} \qquad Vf\ (mm/min.) = \text{r.p.m.} \times f$$

| **D mm** | **d1 mm** | **L mm** | **l mm** | **Z** | **N° Art. 5% Co** | **€** |
|---|---|---|---|---|---|---|
| **25,00** | 13 | 45 | 32 | 8 | 73586 | **118,26** |
| **26,00** | 13 | 45 | 32 | 8 | 73589 | **119,26** |
| **27,00** | 13 | 45 | 32 | 8 | 73592 | **134,39** |
| **28,00** | 13 | 45 | 32 | 8 | 73595 | **130,28** |
| **30,00** | 13 | 45 | 32 | 8 | 73598 | **136,23** |
| **32,00** | 16 | 50 | 36 | 10 | 73601 | **145,37** |
| **34,00** | 16 | 50 | 36 | 10 | 73604 | **162,80** |
| **35,00** | 16 | 50 | 36 | 10 | 73607 | **165,05** |
| **36,00** | 19 | 56 | 40 | 10 | 73610 | **169,79** |
| **38,00** | 19 | 56 | 40 | 10 | 73613 | **180,02** |
| **40,00** | 19 | 56 | 40 | 10 | 73616 | **188,92** |
| **42,00** | 19 | 56 | 40 | 10 | 73619 | **201,24** |
| **45,00** | 22 | 63 | 45 | 12 | 73622 | **213,67** |
| **48,00** | 22 | 63 | 45 | 12 | 73628 | **231,94** |
| **50,00** | 22 | 63 | 45 | 12 | 73631 | **267,72** |
| **52,00** | 27 | 71 | 50 | 12 | 73634 | **284,47** |
| **55,00** | 27 | 71 | 50 | 12 | 73637 | **308,69** |
| **58,00** | 27 | 71 | 50 | 12 | 73640 | **348,68** |
| **60,00** | 27 | 71 | 50 | 12 | 73643 | **361,71** |

# Ref. 2314

## ESCARIADOR MÁQUINA HUECO GAMMON
Gammon Hole Machine Reamer
Alésoir creux finisseur à machine gammon




| HSSE 5% Co | DIN 219 C | d1=1:30 | ISO 2402 | Gammon 45° | **Tol. Agujero Hole** Trou H7 |
|---|---|---|---|---|---|

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | ø Previo mm Previous ø Précédent | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 25 | Ø 40 | Ø 63 | 18-30 | > 30 |
| P | P.1 | 8-12 | 0,350 | 0,400 | 0,500 | 0,3 | 0,2 |
| | P.2 | 6-8 | 0,250 | 0,350 | 0,450 | 0,3 | 0,4 |
| M | | 3-5 | 0,240 | 0,300 | 0,400 | 0,3 | 0,3 |
| K | K.1 | 8-12 | 0,240 | 0,300 | 0,400 | 0,3-0,4 | 0,4-0,6 |
| | K.2 | 4-8 | 0,400 | 0,500 | 0,600 | 0,3-0,4 | 0,3-0,5 |
| S | | 3-5 | 0,300 | 0,350 | 0,450 | 0,3-0,4 | 0,5 |
| N | N.1 | 8-15 | 0,240 | 0,300 | 0,500 | 0,3 | 0,4 |
| | N.2 | 15-20 | 0,400 | 0,500 | 0,600 | 0,3 | 0,4 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

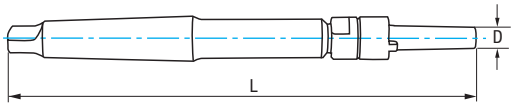
**Vf (mm/min.) = r.p.m. x f**

*** Se puede aumentar el avance hasta un 50%**
*** It is possible to grow feed up to 50%**
* On peut augmenter l'avance jusqu'à un 50%

| D mm | d1 mm | L mm | l mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|
| **25,00** | 13 | 45 | 32 | 6 | 73676 | **221,56** |
| **26,00** | 13 | 45 | 32 | 6 | 74952 | **224,06** |
| **27,00** | 13 | 45 | 32 | 6 | 73679 | **230,07** |
| **28,00** | 13 | 45 | 32 | 6 | 73682 | **234,81** |
| **30,00** | 13 | 45 | 32 | 6 | 73685 | **241,34** |
| **32,00** | 16 | 50 | 36 | 6 | 73688 | **249,27** |
| **34,00** | 16 | 50 | 36 | 6 | 73691 | **257,48** |
| **35,00** | 16 | 50 | 36 | 6 | 73694 | **282,43** |
| **36,00** | 19 | 56 | 40 | 6 | 73697 | **295,00** |
| **38,00** | 19 | 56 | 40 | 6 | 73700 | **311,17** |
| **40,00** | 19 | 56 | 40 | 6 | 73703 | **339,21** |
| **42,00** | 19 | 56 | 40 | 6 | 73706 | **366,78** |
| **45,00** | 22 | 63 | 45 | 6 | 74953 | **405,03** |
| **50,00** | 22 | 63 | 45 | 8 | 73715 | **490,20** |
| **52,00** | 27 | 71 | 50 | 8 | 73718 | **530,78** |
| **55,00** | 27 | 71 | 50 | 8 | 73721 | **591,03** |
| **60,00** | 27 | 71 | 50 | 8 | 73727 | **658,36** |

# Ref. 2316

## MANDRINO ESCARIADOR MÁQUINA HUECO
Hole Machine Reamer Shell Holder
Mandrin alésoir creux finisseur à machine

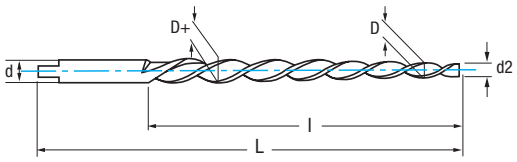



HSS | DIN 217

| D mm | L mm | CM | Apl. DIN 219 | Apl. DIN 222 | Apl. DIN 8054 | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| **13,00** | 250 | 3 | 25-30 mm | 25-35 mm | 30-35 mm | 21098 | **141,60** |
| **16,00** | 261 | 3 | 31-35 mm | 36-45 mm | 36-45 mm | 21099 | **157,36** |
| **19,00** | 298 | 4 | 36-42 mm | 46-53 mm | 46-53 mm | 21100 | **186,59** |
| **22,00** | 312 | 4 | 43-50 mm | 54-63 mm | 54-63 mm | 21101 | **233,79** |
| **27,00** | 359 | 5 | 51-60 mm | 64-75 mm | 64-75 mm | 21102 | **343,96** |

# Ref. 2020

## ESCARIADOR MÁQUINA MANGO CILÍNDRICO HSS
HSS Straight Shank Machine Reamer
Alésoir à machine queue cylindrique HSS




HSS | DIN 2179 E | ISO 3466 | 3 Z | 45° | 1:50

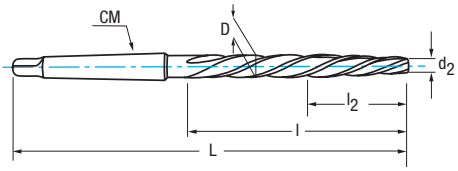
| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | ø Previo mm Previous ø Précédent | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 4 | Ø 6 | Ø 8 | < 5 | 5-8 |
| P | P.1 | 6-10 | 0,080 | 0,120 | 0,180 | 0,2 | 0,2 |
| N | N.5 | 8-10 | 0,120 | 0,160 | 0,200 | 0,2 | 0,3 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | D+ mm | d2 mm | d mm | L mm | l mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| **3,00** | 4,06 | 2,90 | 4,00 | 100 | 58 | 26984 | **45,69** |
| **4,00** | 5,26 | 3,90 | 5,00 | 112 | 68 | 26985 | **42,44** |
| **5,00** | 6,36 | 4,90 | 6,30 | 122 | 73 | 26986 | **40,50** |
| **6,00** | 8,00 | 5,90 | 8,00 | 160 | 105 | 74415 | **46,91** |
| **8,00** | 10,80 | 7,90 | 10,00 | 207 | 145 | 26987 | **75,49** |

# Ref. 2130

## ESCARIADOR MÁQUINA MANGO CÓNICO
Morse Shank Machine Reamer
Alésoir à machine queue cône morse




HSS | DIN 311 | ISO 2238 | 1:10

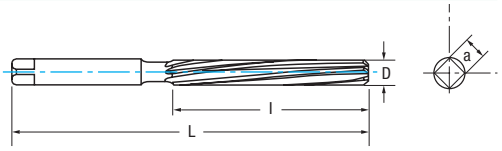
| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | ø Previo mm Previous ø Précédent | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 10 | Ø 16 | Ø 20 | Ø 25 | Ø 30 | 10-18 | 18-30 |
| P | P.1 | 6-10 | 0,180 | 0,250 | 0,300 | 0,350 | 0,400 | 0,2 | 0,2 |
| N | N.5 | 8-10 | 0,200 | 0,250 | 0,300 | 0,400 | 0,500 | 0,2 | 0,3 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D mm | d2 mm | L mm | l mm | l2 mm | CM | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **10,00** | 7,00 | 171 | 95 | 30 | 1 | 4 | 41036 | **64,73** |
| **11,00** | 7,70 | 176 | 100 | 33 | 1 | 4 | 41039 | **67,56** |
| **12,00** | 8,40 | 199 | 105 | 39 | 2 | 5 | 41042 | **72,83** |
| **13,00** | 9,10 | 199 | 105 | 39 | 2 | 5 | 41045 | **75,28** |
| **14,00** | 9,80 | 209 | 115 | 42 | 2 | 5 | 41048 | **80,20** |
| **15,00** | 10,50 | 219 | 125 | 45 | 2 | 5 | 41051 | **84,78** |
| **16,00** | 11,20 | 229 | 135 | 48 | 2 | 5 | 41054 | **91,10** |
| **17,00** | 11,90 | 251 | 135 | 51 | 3 | 5 | 41057 | **99,19** |
| **18,00** | 12,60 | 261 | 145 | 58 | 3 | 5 | 41060 | **107,31** |
| **19,00** | 13,30 | 261 | 145 | 58 | 3 | 5 | 41063 | **130,86** |
| **20,00** | 14,00 | 271 | 155 | 62 | 3 | 5 | 41066 | **133,33** |
| **21,00** | 14,70 | 271 | 155 | 62 | 3 | 5 | 41069 | **141,77** |
| **22,00** | 15,40 | 281 | 165 | 66 | 3 | 5 | 41072 | **150,23** |
| **23,00** | 16,40 | 281 | 165 | 66 | 3 | 5 | 41075 | **161,82** |
| **24,00** | 16,80 | 296 | 180 | 72 | 3 | 5 | 41078 | **183,97** |
| **25,00** | 17,50 | 296 | 180 | 72 | 3 | 5 | 41081 | **188,21** |
| **26,00** | 18,20 | 296 | 180 | 72 | 3 | 5 | 41084 | **205,78** |
| **27,00** | 18,90 | 311 | 195 | 78 | 3 | 5 | 41087 | **222,32** |
| **28,00** | 19,60 | 311 | 195 | 78 | 3 | 5 | 41090 | **235,02** |
| **29,00** | 20,30 | 311 | 195 | 78 | 3 | 5 | 41093 | **244,84** |
| **30,00** | 21,00 | 311 | 195 | 78 | 3 | 5 | 41096 | **272,26** |

# Ref. 2010

## ESCARIADOR MANO
Hand Reamer
Alésoir à main




HSS | DIN 206 B | ISO 236 | Tol. Agujero Hole Trou H7

P P.1 Aceros Steels Aciers | N N.5 Aluminio Aluminium

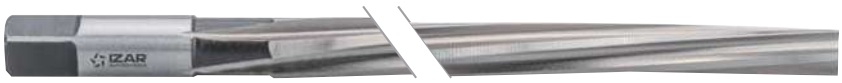
| | D mm | L mm | l mm | a mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| New! | 1,00 | 37 | 12 | | 30685 | 46,51 |
| New! | 1,50 | 41 | 20 | 1,12 | 30689 | 37,34 |
| | 1,60 | 44 | 21 | 1,25 | 74178 | 25,22 |
| | 1,70 | 44 | 21 | 1,25 | 74181 | 25,22 |
| | 1,80 | 47 | 23 | 1,40 | 74184 | 25,22 |
| | 1,90 | 50 | 25 | 1,60 | 74187 | 25,22 |
| | 2,00 | 50 | 25 | 1,60 | 40379 | 18,90 |
| | 2,10 | 50 | 25 | 1,60 | 74190 | 25,22 |
| | 2,20 | 54 | 27 | 1,80 | 74193 | 25,22 |
| | 2,40 | 58 | 29 | 2,10 | 74199 | 25,22 |
| | 2,50 | 58 | 29 | 2,10 | 40382 | 18,90 |
| | 2,60 | 58 | 29 | 2,10 | 75397 | 25,22 |
| | 2,70 | 62 | 31 | 2,10 | 74202 | 25,22 |
| New! | 2,90 | 62 | 31 | 2,10 | 74208 | 25,22 |
| | 2,80 | 62 | 31 | 2,10 | 74205 | 25,22 |
| | 3,00 | 62 | 31 | 2,10 | 40385 | 18,90 |
| | 3,10 | 66 | 33 | 2,40 | 74211 | 25,22 |
| | 3,20 | 66 | 33 | 2,40 | 74214 | 25,22 |
| | 3,30 | 66 | 33 | 2,40 | 74217 | 25,22 |
| | 3,40 | 71 | 35 | 2,70 | 74220 | 25,22 |
| | 3,50 | 71 | 35 | 2,70 | 40388 | 19,82 |
| | 3,60 | 71 | 35 | 2,70 | 74223 | 25,22 |
| | 3,70 | 71 | 35 | 2,70 | 74226 | 25,22 |
| | 3,80 | 76 | 38 | 3,00 | 75398 | 25,22 |
| | 3,90 | 76 | 38 | 3,00 | 74229 | 25,22 |
| | 4,00 | 76 | 38 | 3,00 | 40391 | 18,90 |
| | 4,10 | 76 | 38 | 3,00 | 74232 | 26,35 |
| | 4,20 | 76 | 38 | 3,00 | 74235 | 26,35 |
| | 4,30 | 81 | 41 | 3,40 | 74238 | 26,35 |
| | 4,40 | 81 | 41 | 3,40 | 74241 | 26,35 |
| | 4,50 | 81 | 41 | 3,40 | 40394 | 19,73 |
| | 4,70 | 81 | 41 | 3,40 | 74247 | 26,35 |
| | 4,80 | 87 | 44 | 3,80 | 74250 | 26,35 |
| | 4,90 | 87 | 44 | 3,80 | 74253 | 26,35 |
| | 5,00 | 87 | 44 | 3,80 | 40397 | 19,73 |
| | 5,10 | 87 | 44 | 3,80 | 74256 | 26,35 |
| | 5,20 | 87 | 44 | 3,80 | 74259 | 26,35 |
| | 5,30 | 87 | 44 | 3,80 | 74262 | 26,35 |
| | 5,40 | 93 | 47 | 4,30 | 74265 | 26,35 |
| | 5,50 | 93 | 47 | 4,30 | 40400 | 19,73 |
| | 5,60 | 93 | 47 | 4,30 | 74268 | 26,35 |
| | 5,70 | 93 | 47 | 4,30 | 74271 | 26,35 |

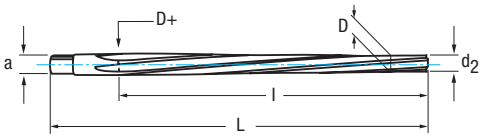
| | D mm | L mm | l mm | a mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| | 5,80 | 93 | 47 | 4,30 | 74274 | 26,35 |
| | 5,90 | 93 | 47 | 4,30 | 74277 | 26,35 |
| | 6,00 | 93 | 47 | 4,30 | 40403 | 19,73 |
| | 6,10 | 100 | 50 | 4,90 | 74280 | 26,35 |
| | 6,20 | 100 | 50 | 4,90 | 75172 | 26,35 |
| | 6,30 | 100 | 50 | 4,90 | 74283 | 26,35 |
| | 6,40 | 100 | 50 | 4,90 | 74286 | 26,35 |
| | 6,50 | 100 | 50 | 4,90 | 40406 | 19,73 |
| | 6,60 | 100 | 50 | 4,90 | 75233 | 26,35 |
| | 6,70 | 100 | 50 | 4,90 | 74289 | 26,35 |
| | 6,80 | 107 | 54 | 5,50 | 74292 | 26,35 |
| | 6,90 | 107 | 54 | 5,50 | 74295 | 26,35 |
| | 7,00 | 107 | 54 | 5,50 | 40409 | 19,73 |
| | 7,10 | 107 | 54 | 5,50 | 74298 | 27,82 |
| | 7,20 | 107 | 54 | 5,50 | 74301 | 27,82 |
| | 7,30 | 107 | 54 | 5,50 | 74947 | 27,82 |
| New! | 7,40 | 107 | 54 | 5,50 | 74304 | 27,82 |
| | 7,50 | 107 | 54 | 5,50 | 40412 | 20,86 |
| | 7,60 | 115 | 58 | 6,20 | 74307 | 27,82 |
| | 7,80 | 115 | 58 | 6,20 | 74313 | 27,82 |
| | 7,90 | 115 | 58 | 6,20 | 74316 | 27,82 |
| | 8,00 | 115 | 58 | 6,20 | 40415 | 20,86 |
| | 8,10 | 115 | 58 | 6,20 | 74319 | 29,21 |
| | 8,20 | 115 | 58 | 6,20 | 74322 | 29,21 |
| | 8,30 | 115 | 58 | 6,20 | 74325 | 29,21 |
| | 8,50 | 115 | 58 | 6,20 | 40418 | 21,87 |
| | 8,60 | 124 | 62 | 7,00 | 74331 | 29,21 |
| | 8,80 | 124 | 62 | 7,00 | 74337 | 29,21 |
| | 8,90 | 124 | 62 | 7,00 | 74340 | 29,21 |
| | 9,00 | 124 | 62 | 7,00 | 40421 | 24,04 |
| | 9,10 | 124 | 62 | 7,00 | 74343 | 30,49 |
| | 9,20 | 124 | 62 | 7,00 | 74346 | 30,49 |
| | 9,30 | 124 | 62 | 7,00 | 74349 | 30,49 |
| | 9,40 | 124 | 62 | 7,00 | 74352 | 30,49 |
| | 9,50 | 124 | 62 | 7,00 | 40424 | 25,09 |
| | 9,60 | 133 | 66 | 8,00 | 74355 | 30,49 |
| | 9,70 | 133 | 66 | 8,00 | 74358 | 30,49 |
| | 9,80 | 133 | 66 | 8,00 | 74361 | 30,49 |
| | 9,90 | 133 | 66 | 8,00 | 74364 | 30,49 |
| | 10,00 | 133 | 66 | 8,00 | 40427 | 25,09 |
| | 10,10 | 133 | 66 | 8,00 | 74367 | 38,53 |

| | D mm | L mm | l mm | a mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| | 10,20 | 133 | 66 | 8,00 | 74370 | 38,53 |
| | 10,30 | 133 | 66 | 8,00 | 74373 | 38,53 |
| | 10,50 | 133 | 66 | 8,00 | 40430 | 28,05 |
| | 10,60 | 142 | 71 | 8,00 | 74379 | 38,53 |
| | 10,70 | 142 | 71 | 9,00 | 74382 | 38,53 |
| | 10,80 | 142 | 71 | 9,00 | 74385 | 38,53 |
| | 11,00 | 142 | 71 | 9,00 | 40433 | 28,05 |
| | 11,10 | 142 | 71 | 9,00 | 74391 | 41,48 |
| | 11,20 | 142 | 71 | 9,00 | 74394 | 41,48 |
| | 11,30 | 142 | 71 | 9,00 | 74397 | 41,48 |
| | 11,40 | 142 | 71 | 9,00 | 74400 | 41,48 |
| | 11,50 | 142 | 71 | 9,00 | 40436 | 41,48 |
| | 11,60 | 142 | 71 | 9,00 | 74403 | 41,48 |
| | 11,70 | 142 | 71 | 9,00 | 74406 | 41,48 |
| | 11,80 | 152 | 76 | 9,00 | 74409 | 41,48 |
| | 11,90 | 152 | 76 | 10,00 | 74412 | 41,48 |
| | 12,00 | 152 | 76 | 10,00 | 40439 | 40,70 |
| | 12,50 | 152 | 76 | 10,00 | 40442 | 51,96 |
| | 13,00 | 152 | 76 | 10,00 | 40445 | 51,96 |
| | 13,50 | 163 | 81 | 11,00 | 40448 | 68,38 |
| | 14,00 | 163 | 81 | 11,00 | 40451 | 55,51 |
| | 14,50 | 163 | 81 | 11,00 | 40454 | 60,63 |
| | 15,00 | 163 | 81 | 11,00 | 40457 | 60,63 |
| | 15,50 | 175 | 87 | 12,00 | 40460 | 65,94 |
| | 16,00 | 175 | 87 | 12,00 | 40463 | 65,94 |
| | 16,50 | 175 | 87 | 12,00 | 40466 | 83,55 |
| | 17,00 | 175 | 87 | 12,00 | 40469 | 79,41 |
| | 17,50 | 188 | 93 | 14,50 | 40472 | 88,67 |
| | 18,00 | 188 | 93 | 14,50 | 40475 | 95,22 |
| | 18,50 | 188 | 93 | 14,50 | 40478 | 95,22 |
| | 19,00 | 188 | 93 | 14,50 | 40481 | 95,22 |
| | 20,00 | 201 | 100 | 16,00 | 40487 | 97,49 |
| | 21,00 | 201 | 100 | 16,00 | 40493 | 97,49 |
| | 22,00 | 215 | 107 | 18,00 | 40499 | 101,01 |
| | 23,00 | 215 | 107 | 18,00 | 40505 | 105,51 |
| | 24,00 | 231 | 115 | 20,00 | 40511 | 116,50 |
| | 25,00 | 231 | 115 | 20,00 | 40517 | 123,66 |
| | 26,00 | 231 | 115 | 20,00 | 40523 | 135,14 |
| | 27,00 | 247 | 124 | 22,40 | 40529 | 147,34 |
| | 28,00 | 247 | 124 | 22,40 | 40535 | 152,50 |
| | 30,00 | 247 | 124 | 22,40 | 40547 | 201,84 |

# Ref. 2026

## ESCARIADOR MANO
Hand Reamer
Alésoir à main






HSS | DIN 9 B | ISO 3465 | 1:50

| | | | | | |
|---|---|---|---|---|---|
| P | P.1 | **Aceros** **Steels** Aciers | N | **N.3 - N.4 N.5 - N.6** | **Aluminio** / **Aluminium** **Plásticos** / **Plastics** / Plastiques |

| D mm | D+ mm | d2 mm | L mm | l mm | a mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| **2,00** | 2,86 | 1,90 | 68 | 48 | 2,50 | 40739 | **32,69** |
| **2,50** | 3,36 | 2,40 | 68 | 48 | 2,50 | 40742 | **32,69** |
| **3,00** | 4,06 | 2,90 | 80 | 58 | 3,15 | 40745 | **31,15** |
| **4,00** | 5,26 | 3,90 | 93 | 68 | 4,00 | 40748 | **31,80** |
| **5,00** | 6,36 | 4,90 | 100 | 73 | 5,00 | 40751 | **30,27** |
| **6,00** | 8,00 | 5,90 | 135 | 105 | 6,30 | 40754 | **40,46** |
| **8,00** | 10,80 | 7,90 | 180 | 145 | 8,00 | 40757 | **53,61** |
| **10,00** | 13,40 | 9,90 | 215 | 175 | 10,00 | 40760 | **57,21** |

Ref. 2010

Ref. 2026

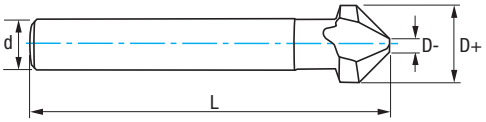
# AVELLANADORES

Countersinks-Counterbores

Outils

# Ref. 9575

## AVELLANADOR METAL DURO 90º
90º Solid Carbide Countersink
Fraise à noyer carbure 90º




| **MD**/HM Carbure Micrograno | DIN 335 C | DIN 6535 HA | | α 90º | 3 Z | Tol. D (± 0,05) | Tol. d (h9) |
|---|---|---|---|---|---|---|---|

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 25 |
| P | P.1 | 40-80 | 0,050 | 0,050 | 0,050 | 0,060 | 0,080 | 0,100 |
| | P.2 | 30-60 | 0,040 | 0,050 | 0,050 | 0,060 | 0,080 | 0,100 |
| | P.3 | 20-40 | 0,040 | 0,050 | 0,050 | 0,060 | 0,080 | 0,100 |
| | P.4 | 10-12 | 0,040 | 0,040 | 0,040 | 0,050 | 0,050 | 0,080 |
| | P.5 | 20-40 | 0,050 | 0,050 | 0,060 | 0,070 | 0,070 | 0,080 |
| M | | 15-20 | 0,050 | 0,050 | 0,060 | 0,070 | 0,070 | 0,080 |
| K | K.1 | 40-80 | 0,050 | 0,050 | 0,060 | 0,080 | 0,100 | 0,100 |
| | K.2 | 40-80 | 0,050 | 0,050 | 0,060 | 0,080 | 0,100 | 0,100 |
| S | | 10-12 | 0,050 | 0,050 | 0,060 | 0,070 | 0,070 | 0,080 |
| N | N.1 | 50-80 | 0,120 | 0,120 | 0,140 | 0,140 | 0,180 | 0,220 |
| | N.2 | 50-80 | 0,120 | 0,120 | 0,140 | 0,140 | 0,180 | 0,220 |
| | N.3 | 40-100 | 0,120 | 0,120 | 0,140 | 0,140 | 0,180 | 0,220 |
| | N.4 | 40-100 | 0,120 | 0,120 | 0,140 | 0,140 | 0,180 | 0,220 |
| | N.5 | 40-80 | 0,120 | 0,120 | 0,140 | 0,140 | 0,180 | 0,220 |

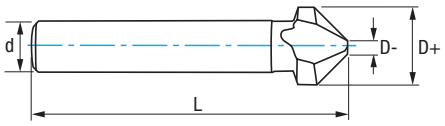
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x f**

| D+ mm | D- mm | d mm | L mm | Z | N° Art. MD/HM | € |
|---|---|---|---|---|---|---|
| **6,30** | 1,50 | 5,00 | 45 | 3 | 68440 | **54,90** |
| **8,30** | 2,00 | 6,00 | 50 | 3 | 68441 | **60,76** |
| **10,40** | 2,50 | 6,00 | 50 | 3 | 68442 | **66,55** |
| **12,40** | 2,80 | 8,00 | 56 | 3 | 68443 | **72,05** |
| **16,50** | 3,20 | 10,00 | 60 | 3 | 68444 | **81,26** |
| **20,50** | 3,50 | 10,00 | 63 | 3 | 68445 | **118,56** |
| **25,00** | 3,80 | 10,00 | 67 | 3 | 68446 | **160,49** |

# Ref. 6575

## AVELLANADOR PMX 90° MATERIALES MUY DUROS
Very Hard Materials 90° PMX Countersink
Fraise à noyer PMX 90° matériaux très durs




| PMX | DIN 335 C | | α 90° | 3 Z | Tol. D (± 0,05) | Tol. d (h9) | Tol. L (± 1) | Tol. $\alpha^{0}_{-1}$ |
|---|---|---|---|---|---|---|---|---|

Video

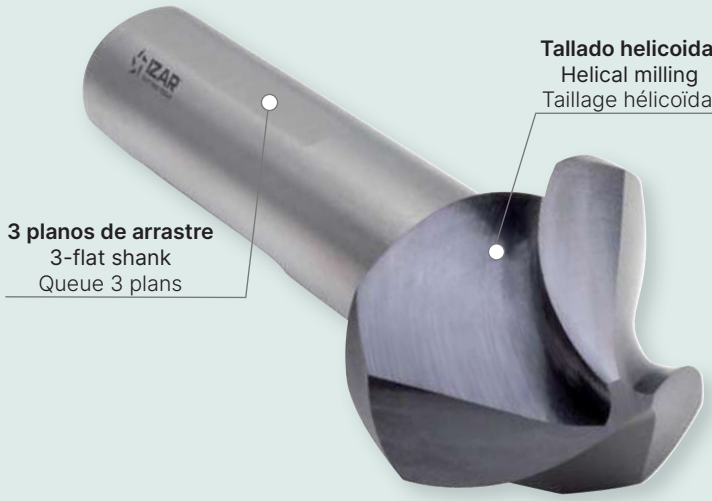
| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | PMX | Ø 6 | Ø 8 | Ø 10 | Ø 16 | Ø 20 | Ø 25 | Ø 28 | Ø 30 |
| P | P.3 | 6-10 | 0,030 | 0,040 | 0,050 | 0,080 | 0,090 | 0,100 | 0,140 | 0,140 |
| | P.4 | 5-12 | 0,030 | 0,040 | 0,050 | 0,080 | 0,090 | 0,100 | 0,140 | 0,140 |
| | P.5 | 4-8 | 0,030 | 0,040 | 0,050 | 0,060 | 0,080 | 0,100 | 0,110 | 0,110 |
| M | | 4-8 | 0,040 | 0,050 | 0,060 | 0,080 | 0,100 | 0,110 | 0,120 | 0,120 |
| N | N.6 | 10-12 | 0,050 | 0,070 | 0,080 | 0,100 | 0,120 | 0,140 | 0,180 | 0,180 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

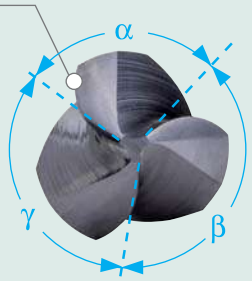
| | D+ mm | D- mm | d mm | L mm | N° Art. PMX | € |
|---|---|---|---|---|---|---|
| | **6,30** | 1,50 | 5 | 45 | 42829 | **34,60** |
| | **8,30** | 2,00 | 6 | 50 | 42830 | **43,81** |
| | **10,40** | 2,50 | 6 | 50 | 42832 | **55,35** |
| | **12,40** | 2,80 | 8 | 56 | 42833 | **59,95** |
| | **16,50** | 3,20 | 10 | 60 | 42836 | **66,85** |
| | **20,50** | 3,50 | 10 | 63 | 42839 | **92,22** |
| | **25,00** | 3,80 | 10 | 67 | 42845 | **126,80** |
| | **28,00** | 4,00 | 12 | 71 | 69807 | **177,64** |
| | **30,00** | 4,20 | 12 | 71 | 69808 | **190,02** |
| New! | **40,00** | 5,00 | 15 | 80 | 76916 | **345,58** |

### Set 6 Pcs

| Cont. Ø | N° Art. PMX | € |
|---|---|---|
| **6,3-8,3-10,4-12,4-16,5-20,5** | 65518 | **352,78** |




**Aristas de corte convexas**
Convex cutting edges
Arêtes de coupe convexes




$\alpha \neq \beta \neq \gamma$

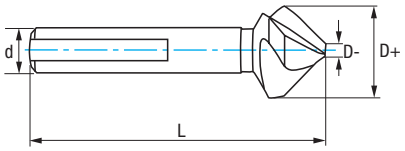
**Desplazamiento desigual de los dientes**
Unequal flute spacing
Déplacement inégal

# Ref. 2571

## AVELLANADOR ANTIVIBRACIÓN 3Z HELICOIDAL DESPLAZAMIENTO DESIGUAL

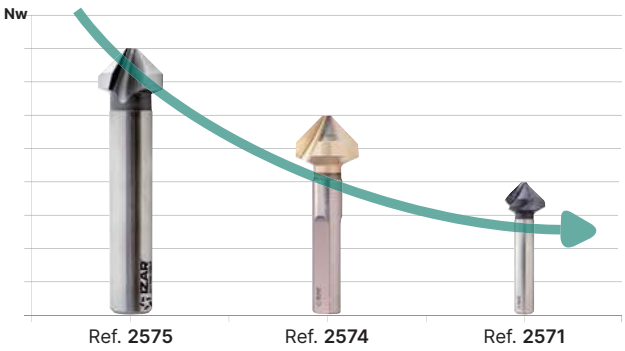
Unequal Flute Spacing Spiral Anti-Vibration 3Z Countersink
Fraise à noyer anti-vibration 3Z hélicoïdal déplacement inégal

New!




| HSSE 5% Co | TIALN | DIN 335 C | | α 90° | $\alpha \neq \beta \neq \gamma$ | 3 Z | Tol. D (± 0,05) | Tol. d (h9) | Tol. L (± 1) | Tol. $\alpha^{0}_{-1}$ |
|---|---|---|---|---|---|---|---|---|---|---|

**REDUCCIÓN DE LAS FUERZAS DE CORTE**
Cutting forces decreased
Réduction des forces de coupe




| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | TIALN | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 25 |
| P | P.1 | 25-40 | 0,100 | 0,100 | 0,100 | 0,120 | 0,160 | 0,200 |
| | P.2 | 15-20 | 0,100 | 0,100 | 0,100 | 0,120 | 0,160 | 0,200 |
| | P.3 | 10-20 | 0,100 | 0,100 | 0,100 | 0,120 | 0,160 | 0,200 |
| | P.4 | 5-10 | 0,040 | 0,040 | 0,040 | 0,050 | 0,050 | 0,080 |
| | P.5 | 10-15 | 0,050 | 0,050 | 0,060 | 0,070 | 0,070 | 0,080 |
| M | | 15-20 | 0,050 | 0,050 | 0,060 | 0,070 | 0,070 | 0,080 |
| K | K.1 | 20-30 | 0,100 | 0,100 | 0,100 | 0,120 | 0,160 | 0,200 |
| | K.2 | 20-30 | 0,100 | 0,100 | 0,100 | 0,120 | 0,160 | 0,200 |
| S | | 10-12 | 0,050 | 0,050 | 0,060 | 0,070 | 0,070 | 0,080 |
| N | N.1 | 30-40 | 0,150 | 0,160 | 0,170 | 0,190 | 0,210 | 0,260 |
| | N.2 | 25-30 | 0,150 | 0,160 | 0,170 | 0,190 | 0,210 | 0,260 |
| | N.3 | 40-100 | 0,150 | 0,160 | 0,170 | 0,190 | 0,210 | 0,260 |
| | N.4 | 40-100 | 0,150 | 0,160 | 0,170 | 0,190 | 0,210 | 0,260 |
| | N.5 | 30-40 | 0,120 | 0,120 | 0,140 | 0,140 | 0,180 | 0,220 |
| | N.6 | 20-50 | 0,150 | 0,160 | 0,170 | 0,190 | 0,210 | 0,260 |
| | N.7 | 20-40 | 0,120 | 0,120 | 0,140 | 0,140 | 0,180 | 0,220 |

**- Reducción drástica de los esfuerzos de corte**
**- Avellanado de precisión con el mínimo de rebaba**

- Drastic reduction of cutting forces
- Precision countersinking with minimal burr
- Réduction drastique des forces de coupe
- Fraisage de précision avec une bavure minimale

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times Ø} \qquad Vf\ (mm/min.) = \text{r.p.m.} \times f$$

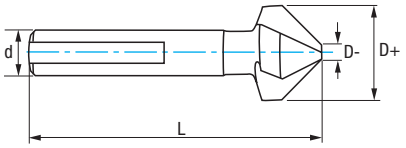
| D+ mm | D- mm | d mm | L mm | N° Art TIALN | € |
|---|---|---|---|---|---|
| **06,30** | 1,50 | 5 | 45 | 85211 | **22,90** |
| **08,30** | 2,00 | 6 | 50 | 85212 | **25,58** |
| **10,40** | 2,50 | 6 | 50 | 85213 | **32,47** |
| **12,40** | 2,80 | 8 | 56 | 85214 | **30,99** |
| **16,50** | 3,20 | 10 | 60 | 85215 | **43,12** |
| **20,50** | 3,50 | 10 | 63 | 85216 | **56,27** |
| **25,00** | 3,80 | 10 | 67 | 85217 | **73,29** |

## Set 6 Pcs

| Cont. Ø | N° Art TIALN | € |
|---|---|---|
| **6,3-8,3-10,4-12,4-16,5-20,5** | 85218 | Set Price! **200,76** |

# Ref. 2574

## AVELLANADOR ANTIVIBRACIÓN 3Z DESPLAZAMIENTO DESIGUAL
Unequal Flute Spacing Anti-Vibration 3Z Countersink
Fraise à noyer anti-vibration 3Z déplacement inégal




HSSE 5% Co | Zirkonio | DIN 335 C | * | α 90° | α ≠ β ≠ γ | 3 Z | Tol. D (± 0,05) | Tol. d (h9) | Tol. L (± 1) | Tol. $\alpha^{0}_{-1}$

* **Mango liso hasta fin de existencias**
Plain Shank while stock lasts
Queue plaine jusqu'á la fin de stock

| Material | | Vc (m/min) | | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSSE | Zirkonio | Ø 6 | Ø 8 | Ø 10 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 |
| P | P.1 | 15-20 | 17-23 | 0,060 | 0,080 | 0,100 | 0,120 | 0,150 | 0,180 | 0,200 | 0,220 |
| | P.5 | 4-8 | 5-9 | 0,030 | 0,040 | 0,050 | 0,060 | 0,080 | 0,090 | 0,100 | 0,120 |
| M | | 4-8 | 5-9 | 0,040 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 | 0,140 | 0,160 |
| N | N.1 | 20-30 | 23-35 | 0,060 | 0,080 | 0,100 | 0,120 | 0,150 | 0,180 | 0,200 | 0,220 |
| | N.3 | 15-25 | 17-29 | 0,090 | 0,110 | 0,130 | 0,160 | 0,190 | 0,210 | 0,260 | 0,290 |
| | N.4 | 15-25 | 17-29 | 0,090 | 0,110 | 0,130 | 0,160 | 0,190 | 0,210 | 0,260 | 0,290 |
| | N.5 | 8-12 | 9-14 | 0,090 | 0,110 | 0,130 | 0,160 | 0,190 | 0,210 | 0,260 | 0,290 |
| | N.6 | 20-30 | 23-35 | 0,100 | 0,120 | 0,150 | 0,180 | 0,200 | 0,220 | 0,280 | 0,320 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D+ mm | D- mm | d mm | L mm | * N° Art. 5% Co | € | * N° Art. Zirkonio | € | New! N° Art. 5% Co | € | New! N° Art. Zirkonio | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4,30 | 1,30 | 4 | 40 | 16599 | 15,87 | 16748 | 17,75 | 84766 | 19,04 | 84741 | 21,30 |
| 5,30 | 1,50 | 4 | 40 | 16600 | 15,73 | 16752 | 17,59 | 84767 | 18,88 | 84746 | 21,11 |
| 6,00 | 1,50 | 5 | 45 | 16606 | 16,08 | 16753 | 17,98 | 84768 | 19,30 | 84747 | 21,58 |
| 6,30 | 1,50 | 5 | 45 | 16622 | 15,51 | 16771 | 17,35 | 84769 | 18,61 | 84748 | 20,82 |
| 8,00 | 2,00 | 6 | 50 | 16642 | 16,75 | 16773 | 19,18 | 84770 | 20,10 | 84749 | 23,02 |
| 8,30 | 2,00 | 6 | 50 | 16629 | 16,92 | 16784 | 19,38 | 84771 | 20,30 | 84750 | 23,26 |
| 9,40 | 2,20 | 6 | 50 | 16643 | 17,70 | 16793 | 19,67 | 84772 | 21,24 | 84751 | 23,60 |
| 10,00 | 2,50 | 6 | 50 | 16646 | 18,56 | 16795 | 20,66 | 84773 | 22,27 | 84752 | 24,79 |
| 10,40 | 2,50 | 6 | 50 | 16633 | 22,09 | 16796 | 24,60 | 84774 | 26,51 | 84753 | 29,52 |
| 11,50 | 2,80 | 8 | 56 | 16661 | 20,71 | 16843 | 22,71 | 84775 | 24,85 | 84754 | 27,25 |
| 12,40 | 2,80 | 8 | 56 | 16634 | 21,42 | 16847 | 23,48 | 84776 | 25,70 | 84757 | 28,18 |
| 15,00 | 3,20 | 10 | 60 | 16691 | 26,52 | 16860 | 28,46 | 84777 | 31,82 | 84758 | 34,15 |
| 16,50 | 3,20 | 10 | 60 | 16635 | 30,43 | 16875 | 32,67 | 84778 | 36,52 | 84759 | 39,20 |
| 20,50 | 3,50 | 10 | 63 | 16640 | 40,56 | 16909 | 42,63 | 84779 | 48,67 | 84760 | 51,16 |
| 25,00 | 3,80 | 10 | 67 | 16694 | 53,17 | 16926 | 55,52 | 84781 | 63,80 | 84761 | 66,62 |
| 28,00 | 4,00 | 12 | 71 | 16739 | 74,28 | 16934 | 76,18 | 84782 | 89,14 | 84762 | 91,42 |
| 30,00 | 4,20 | 12 | 71 | 16741 | 78,40 | 16938 | 80,66 | 84783 | 94,08 | 84763 | 96,79 |
| 31,00 | 4,20 | 12 | 71 | 16746 | 78,40 | 16942 | 80,66 | 84784 | 94,08 | 84764 | 96,79 |
| 40,00 | 5,00 | 15 | 80 | 61826 | 142,58 | 61841 | 162,64 | 84785 | 171,10 | 84765 | 195,17 |

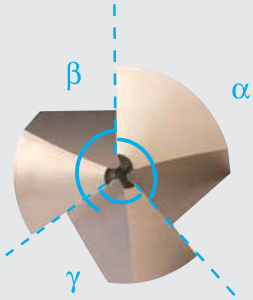
Set 6 Pcs — Set Price!

| Cont. Ø | N° Art. Zirkonio | € |
|---|---|---|
| 6,3-8,3-10,4-12,4-16,5-20,5 | 16943 * | 160,11 |
| | 85219 | 182,53 |

- **Avellanador 3Z a 90° "Antivibración"**
- **Desplazamiento desigual de los dientes que evita vibraciones y mejora los acabados superficiales de los avellanados.**
- **Recubrimiento especial de Zirkonio.**
- **3 planos de arrastre: evita el deslizamiento en el portabrocas.**

- Anti-vibration 90° 3Z countersink.
- Unequal flute spacing geometry avoids vibrations and improves the surface finishing.
- Special Zirkonio coating.
- 3-flat shank: Prevents slipping in the chuck

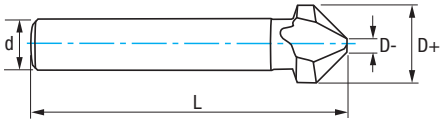
- Fraise anti-vibration 90° 3Z.
- Déplacement inégal des dents qui évite les vibrations et améliore les finitions de surface des fraisures.
- Revêtement spécial Zirkonium.
- 3 plans : empêche le glissement dans le mandrin




$\alpha \neq \beta \neq \gamma$

# Ref. 2575

## AVELLANADOR MANGO CILÍNDRICO HSSE 3Z 90°
90° 3Z HSSE Straight Shank Countersink
Fraise à noyer HSSE 3Z 90°




| HSSE 5% Co | DIN 335 C | | α 90° | 3 Z | Tol. D (± 0,05) | Tol. d (h9) | Tol. L (± 1) | Tol. $\alpha^{0}_{-1}$ |
|---|---|---|---|---|---|---|---|---|

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSSE | Ø 6 | Ø 8 | Ø 10 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 |
| P | P.1 | 15-20 | 0,060 | 0,080 | 0,100 | 0,120 | 0,150 | 0,180 | 0,200 | 0,220 |
| | P.5 | 4-8 | 0,030 | 0,040 | 0,050 | 0,060 | 0,080 | 0,090 | 0,100 | 0,120 |
| M | | 4-8 | 0,040 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 | 0,140 | 0,160 |
| N | N.1 | 20-30 | 0,060 | 0,080 | 0,100 | 0,120 | 0,150 | 0,180 | 0,200 | 0,220 |
| | N.3 | 15-25 | 0,090 | 0,110 | 0,130 | 0,160 | 0,190 | 0,210 | 0,260 | 0,290 |
| | N.4 | 15-25 | 0,090 | 0,110 | 0,130 | 0,160 | 0,190 | 0,210 | 0,260 | 0,290 |
| | N.5 | 8-12 | 0,090 | 0,110 | 0,130 | 0,160 | 0,190 | 0,210 | 0,260 | 0,290 |
| | N.6 | 20-30 | 0,100 | 0,120 | 0,150 | 0,180 | 0,200 | 0,220 | 0,280 | 0,320 |

**r.p.m.** $= \frac{Vc \times 1.000}{\pi \times Ø}$ **Vf (mm/min.) = r.p.m. x f**

| D+ mm | D- mm | d mm | L mm | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **4,30** | 1,30 | 4 | 40 | 74653 | **13,89** |
| **5,00** | 1,50 | 4 | 40 | 74654 | **13,47** |
| **5,30** | 1,50 | 4 | 40 | 74655 | **13,78** |
| **5,80** | 1,50 | 5 | 45 | 74656 | **14,09** |
| **6,00** | 1,50 | 5 | 45 | 74657 | **14,09** |
| **6,30** | 1,50 | 5 | 45 | 74658 | **13,61** |
| **7,00** | 1,80 | 6 | 50 | 74659 | **13,76** |
| **7,30** | 1,80 | 6 | 50 | 74660 | **13,95** |
| **8,00** | 2,00 | 6 | 50 | 74661 | **14,72** |
| **8,30** | 2,00 | 6 | 50 | 74662 | **14,87** |
| **9,40** | 2,20 | 6 | 50 | 74663 | **15,51** |
| **10,00** | 2,50 | 6 | 50 | 74664 | **16,27** |
| **10,40** | 2,50 | 6 | 50 | 74665 | **19,39** |
| **11,50** | 2,80 | 8 | 56 | 74666 | **18,01** |
| **12,40** | 2,80 | 8 | 56 | 74667 | **18,62** |
| **13,40** | 2,90 | 8 | 56 | 74668 | **20,35** |
| **15,00** | 3,20 | 10 | 60 | 74669 | **23,00** |
| **16,50** | 3,20 | 10 | 60 | 74670 | **26,40** |
| **19,00** | 3,50 | 10 | 63 | 74671 | **34,42** |
| **20,50** | 3,50 | 10 | 63 | 74672 | **35,23** |
| **23,00** | 3,80 | 10 | 67 | 74673 | **43,05** |
| **25,00** | 3,80 | 10 | 67 | 74674 | **46,20** |
| **28,00** | 4,00 | 12 | 71 | 42714 | **64,70** |
| **30,00** | 4,20 | 12 | 71 | 12588 | **69,22** |
| **31,00** | 4,20 | 12 | 71 | 42715 | **69,22** |
| **40,00** | 5,00 | 15 | 80 | 11061 | **125,88** |

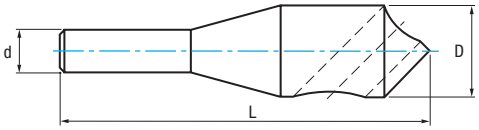
**Recubrimiento bajo demanda**
**Coating upon request**
Revêtement sur demande

**Set 6 Pcs**

| Cont. Ø | N° Art. 5% Co | € |
|---|---|---|
| **6,3-8,3-10,4-12,4-16,5-20,5** | 40515 | **128,12** |

# Ref. 2572

## AVELLANADOR MANGO CILÍNDRICO HSSE AGUJERO 90°
90° Hole HSSE Straight Shank Countersink
Fraise à ebavurer HSSE trou 90°




| HSSE 5% Co | IZAR Std. | | α 90° | Tol. D +0 +0,3 | Tol. d (h9) | Tol. L (± 1) | Tol. α 0 -1 |
|---|---|---|---|---|---|---|---|

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 6 | Ø 8 | Ø 10 | Ø 16 | Ø 20 | Ø 25 |
| P | P.1 | 10-20 | 0,060 | 0,080 | 0,100 | 0,120 | 0,150 | 0,180 |
| M | | 4-8 | 0,040 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 |
| N | N.3 | 15-25 | 0,090 | 0,110 | 0,130 | 0,160 | 0,190 | 0,210 |
| | N.4 | 15-25 | 0,090 | 0,110 | 0,130 | 0,160 | 0,190 | 0,210 |
| | N.5 | 8-12 | 0,090 | 0,110 | 0,130 | 0,160 | 0,190 | 0,210 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

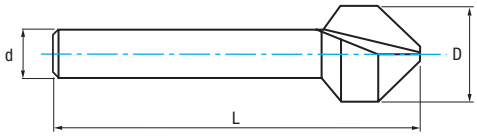
| Aplic. mm | D mm | d mm | L mm | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **2-5** | 10 | 6 | 46 | 69183 | **24,19** |
| **5-10** | 14 | 8 | 55 | 69181 | **32,65** |
| **10-15** | 20 | 10 | 65 | 69184 | **60,41** |
| **15-20** | 28 | 12 | 85 | 69187 | **114,88** |
| **20-25** | 30 | 15 | 95 | 69186 | **163,26** |

### Set 4 Pcs

| Aplic. mm | N° Art. 5% Co | € |
|---|---|---|
| **2-5, 5-10, 10-15, 15-20** | 40513 | **232,13** |

# Ref. 2573

## AVELLANADOR MANGO CILÍNDRICO HSS 1Z 90°
90° 1Z HSS Straight Shank Countersink
Fraise à noyer HSS 1Z 90°




| HSS | DIN 335 C | | α 90° | 1 Z | Tol. D (± 0,05) | Tol. d (h9) | Tol. L (± 5) | Tol. $\alpha^{0}_{-3}$ |
|---|---|---|---|---|---|---|---|---|

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 6 | Ø 8 | Ø 10 | Ø 16 | Ø 20 | Ø 25 | Ø 30 |
| P | P.1 | 15-20 | 0,060 | 0,080 | 0,100 | 0,120 | 0,150 | 0,180 | 0,200 |
| | P.5 | 4-8 | 0,030 | 0,040 | 0,050 | 0,060 | 0,080 | 0,090 | 0,100 |
| M | | 4-8 | 0,040 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 | 0,140 |
| N | N.1 | 20-30 | 0,060 | 0,080 | 0,100 | 0,120 | 0,150 | 0,180 | 0,200 |
| | N.3 | 15-25 | 0,090 | 0,110 | 0,130 | 0,160 | 0,190 | 0,210 | 0,260 |
| | N.4 | 15-25 | 0,090 | 0,110 | 0,130 | 0,160 | 0,190 | 0,210 | 0,260 |
| | N.5 | 8-12 | 0,090 | 0,110 | 0,130 | 0,160 | 0,190 | 0,210 | 0,260 |
| | N.6 | 20-30 | 0,100 | 0,120 | 0,150 | 0,180 | 0,200 | 0,220 | 0,280 |

| D mm | d mm | L mm | N° Art. HSS | € |
|---|---|---|---|---|
| **6,00** | 5 | 45 | 13281 | **12,15** |
| **8,00** | 6 | 50 | 13284 | **13,30** |
| **10,00** | 6 | 50 | 13286 | **14,57** |
| **12,00** | 8 | 56 | 13287 | **15,06** |
| **16,00** | 10 | 60 | 13290 | **17,98** |
| **20,00** | 10 | 63 | 13293 | **21,67** |
| **25,00** | 10 | 67 | 13294 | **25,54** |
| **30,00** | 12 | 71 | 13296 | **42,07** |

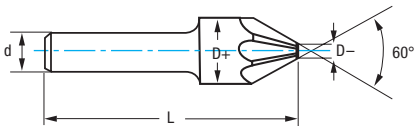
**New!**

### Set 6 Pcs

| Cont. Ø | N° Art. HSS | € |
|---|---|---|
| **6-8-10-12-16-20** | 62985 | **94,73** |

# Ref. 2550

## AVELLANADOR MANGO CILÍNDRICO HSS 60°
60° HSS Straight Shank Countersink
Fraise à noyer HSS 60°




HSS | DIN 334 A | | α 60° | ISO 3294 | Tol. d h9

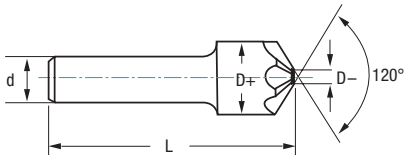
| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 8 | Ø 10 | Ø 16 | Ø 20 | Ø 25 |
| P | P.1 | 15-20 | 0,080 | 0,100 | 0,120 | 0,150 | 0,180 |
| | P.2 | 10-15 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 |
| S | | 8-12 | 0,040 | 0,050 | 0,060 | 0,080 | 0,090 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D+ mm | D– mm | d mm | L mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| **8,00** | 1,60 | 8 | 48 | 5 | 42119 | **43,20** |
| **10,00** | 2,00 | 8 | 50 | 5 | 42122 | **45,04** |
| **12,50** | 2,50 | 8 | 52 | 5 | 42125 | **47,09** |
| **16,00** | 3,20 | 10 | 60 | 7 | 42128 | **53,96** |
| **20,00** | 4,00 | 10 | 64 | 7 | 42131 | **63,90** |
| **25,00** | 7,00 | 10 | 69 | 9 | 42134 | **71,81** |

# Ref. 2580

## AVELLANADOR MANGO CILÍNDRICO HSS 120°
120° HSS Straight Shank Countersink
Fraise à noyer HSS 120°




HSS | DIN 347 A | | α 120° | ISO 3294 | Tol. d h9

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 8 | Ø 10 | Ø 16 | Ø 20 | Ø 25 |
| P | P.1 | 15-20 | 0,080 | 0,100 | 0,120 | 0,150 | 0,180 |
| | P.2 | 10-15 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 |
| S | | 8-12 | 0,040 | 0,050 | 0,060 | 0,080 | 0,090 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

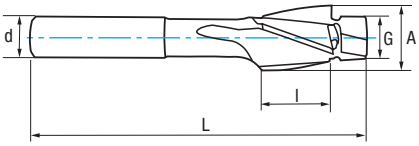
| D+ mm | D– mm | d mm | L mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| **8,00** | 1,60 | 8 | 44 | 5 | 42170 | **41,14** |
| **10,00** | 2,00 | 8 | 46 | 5 | 42173 | **42,90** |
| **12,50** | 2,50 | 8 | 48 | 5 | 42176 | **44,85** |
| **16,00** | 3,20 | 10 | 56 | 7 | 42179 | **51,39** |
| **20,00** | 4,00 | 10 | 60 | 7 | 42182 | **60,85** |
| **25,00** | 7,00 | 10 | 65 | 9 | 42185 | **68,38** |

Ref. 2550

Ref. 2580

# Ref. 2530

## AVELLANADOR MANGO CILÍNDRICO ALLEN
Allen Straight Shank Counterbore
Fraise à lamer et chambrer




| HSS | DIN 373 | ISO 4206 | | | Tol. A z9 | Tol. G e8 | Tol. d h9 |
|---|---|---|---|---|---|---|---|

### PREPARACIÓN ASIENTOS CILÍNDRICOS ALLEN
Allen Straight Shank Hole Preparation
Préparation des trous cylindriques ALLEN

**DIN-912, DIN-6912, DIN-84, DIN-7984**

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | |
|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | M - 6 | M - 8 | M - 10 | M - 16 |
| P | P.1 | 15-20 | 0,060 | 0,080 | 0,100 | 0,120 |
| | P.2 | 10-15 | 0,040 | 0,050 | 0,060 | 0,080 |
| | P.5 | 4-8 | 0,030 | 0,040 | 0,050 | 0,060 |
| K | K.1 | 10-20 | 0,080 | 0,100 | 0,120 | 0,150 |
| S | | 8-12 | 0,030 | 0,040 | 0,050 | 0,060 |
| N | N.1 | 20-30 | 0,060 | 0,080 | 0,100 | 0,120 |
| | N.2 | 20-30 | 0,090 | 0,110 | 0,130 | 0,160 |
| | N.5 | 8-12 | 0,090 | 0,110 | 0,130 | 0,160 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = \text{r.p.m.} \times f$$

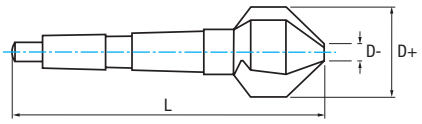
| M | A mm | G mm | d mm | L mm | l mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **M3** | 6,50 | 3,40 | 5,00 | 71 | 14 | 3 | 42029 | **20,76** |
| **M4** | 8,00 | 4,50 | 5,00 | 71 | 14 | 3 | 42032 | **20,76** |
| **M5** | 10,00 | 5,50 | 8,00 | 80 | 18 | 3 | 42035 | **20,76** |
| **M6** | 11,00 | 6,60 | 8,00 | 80 | 18 | 3 | 42038 | **23,40** |
| **M8** | 15,00 | 9,00 | 12,50 | 100 | 22 | 3 | 42041 | **28,96** |
| **M10** | 18,00 | 11,00 | 12,50 | 100 | 22 | 3 | 42044 | **34,47** |
| **M12** | 20,00 | 13,50 | 12,50 | 100 | 22 | 3 | 42047 | **40,81** |
| **M14** | 24,00 | 15,50 | 16,00 | 100 | 22 | 4 | 42050 | **61,00** |
| **M16** | 26,00 | 17,50 | 16,00 | 100 | 22 | 4 | 42053 | **67,44** |

### Set 6 Pcs

| Cont. | N° Art. HSS | € |
|---|---|---|
| **M3-M4-M5-M6-M8-M10** | 40512 | **149,11** |

# Ref. 2685

## AVELLANADOR MANGO CÓNICO HSS 3Z 90°
90° 3Z HSS Morse Taper Shank Countersink
Fraise à noyer queue cône morse HSS 3Z 90°




HSS | DIN 335 D | | α 90° | 3 Z

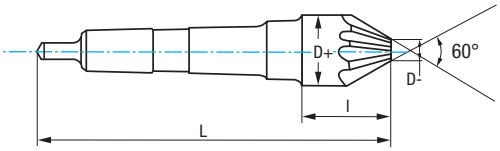
| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 20 | Ø 25 | Ø 32 | Ø 40 | Ø 60 | Ø 80 |
| P | P.1 | 15-20 | 0,150 | 0,180 | 0,200 | 0,220 | 0,250 | 0,280 |
| | P.5 | 4-8 | 0,100 | 0,120 | 0,140 | 0,160 | 0,180 | 0,200 |
| M | | 4-8 | 0,100 | 0,120 | 0,140 | 0,160 | 0,180 | 0,200 |
| N | N.1 | 20-30 | 0,150 | 0,180 | 0,200 | 0,220 | 0,250 | 0,280 |
| | N.3 | 15-25 | 0,190 | 0,210 | 0,260 | 0,290 | 0,330 | 0,360 |
| | N.4 | 15-25 | 0,190 | 0,210 | 0,260 | 0,290 | 0,330 | 0,360 |
| | N.5 | 8-12 | 0,190 | 0,210 | 0,260 | 0,290 | 0,330 | 0,360 |
| | N.6 | 20-30 | 0,200 | 0,220 | 0,280 | 0,320 | 0,360 | 0,400 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D+ mm | D- mm | L mm | Z | CM | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| **16,50** | 3,20 | 85 | 3 | 1 | 42717 | **69,22** |
| **20,50** | 3,50 | 100 | 3 | 2 | 42719 | **80,01** |
| **25,00** | 3,80 | 106 | 3 | 2 | 42721 | **81,66** |
| **31,00** | 4,20 | 112 | 3 | 2 | 42725 | **89,92** |
| **40,00** | 10,00 | 140 | 3 | 3 | 42728 | **160,24** |
| **50,00** | 14,00 | 150 | 3 | 3 | 42729 | **200,22** |
| **63,00** | 16,00 | 180 | 3 | 4 | 42730 | **326,98** |
| **80,00** | 22,00 | 190 | 3 | 4 | 42731 | **554,84** |

# Ref. 2660

## AVELLANADOR MANGO CÓNICO HSS 60°
60° HSS Morse Taper Shank Countersink
Fraise à noyer queue cône morse HSS 60°




HSS | DIN 334 B | 60° | ISO 3293

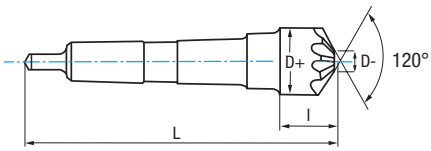
| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 | Ø 60 | Ø 80 |
| P | P.1 | 15-20 | 0,120 | 0,150 | 0,180 | 0,200 | 0,220 | 0,250 | 0,280 |
| | P.2 | 10-15 | 0,080 | 0,100 | 0,120 | 0,140 | 0,160 | 0,180 | 0,200 |
| S | | 8-12 | 0,060 | 0,080 | 0,090 | 0,100 | 0,120 | 0,140 | 0,160 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D+ mm | D- mm | L mm | l mm | Z | CM | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| **16,00** | 3,20 | 97 | 24 | 7 | 1 | 42542 | **68,54** |
| **20,00** | 4,00 | 120 | 28 | 7 | 2 | 42545 | **80,23** |
| **25,00** | 7,00 | 125 | 33 | 9 | 2 | 42548 | **87,90** |
| **31,50** | 9,00 | 132 | 40 | 9 | 2 | 42551 | **115,38** |
| **40,00** | 12,50 | 160 | 45 | 11 | 3 | 42554 | **202,39** |
| **50,00** | 16,00 | 165 | 50 | 13 | 3 | 42557 | **241,88** |
| **63,00** | 20,00 | 200 | 58 | 15 | 4 | 42560 | **386,38** |
| **80,00** | 25,00 | 215 | 73 | 17 | 4 | 42563 | **597,15** |

# Ref. 2690

## AVELLANADOR MANGO CÓNICO HSS 120°
120° HSS Morse Taper Shank Countersink
Fraise à noyer queue cône morse HSS 120°




HSS | DIN 347 B | 120° | ISO 3293

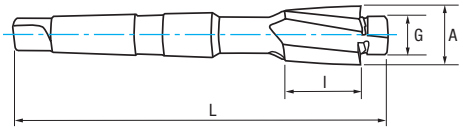
| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 | Ø 60 | Ø 80 |
| P | P.1 | 15-20 | 0,120 | 0,150 | 0,180 | 0,200 | 0,220 | 0,250 | 0,280 |
| | P.2 | 10-15 | 0,080 | 0,100 | 0,120 | 0,140 | 0,160 | 0,180 | 0,200 |
| S | | 8-12 | 0,060 | 0,080 | 0,090 | 0,100 | 0,120 | 0,140 | 0,160 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = r.p.m. \times f$$

| D+ mm | D- mm | L mm | l mm | Z | CM | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| **16,00** | 3,20 | 93 | 20 | 7 | 1 | 42590 | **71,95** |
| **20,00** | 4,00 | 116 | 24 | 7 | 2 | 42593 | **84,25** |
| **25,00** | 7,00 | 121 | 29 | 9 | 2 | 42596 | **92,30** |
| **31,50** | 9,00 | 124 | 32 | 9 | 2 | 42599 | **121,15** |
| **40,00** | 12,50 | 150 | 35 | 11 | 3 | 42602 | **212,50** |
| **50,00** | 16,00 | 153 | 38 | 13 | 3 | 42605 | **253,97** |
| **63,00** | 20,00 | 185 | 43 | 15 | 4 | 42608 | **405,69** |
| **80,00** | 25,00 | 196 | 54 | 17 | 4 | 42611 | **627,01** |

# Ref. 2630

## AVELLANADOR MANGO CÓNICO ALLEN
Allen Morse Taper Shank Counterbore
Fraise à chambrer allen




| HSS | DIN 375 | | Tol. A z9 | Tol. G e8 |
|---|---|---|---|---|

### PREPARACIÓN ASIENTOS CILÍNDRICOS ALLEN
Allen Straight Shank Hole Preparation
Préparation des trous cylindriques ALLEN

**DIN-912, DIN-6912, DIN-84, DIN-7984**

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | M - 8 | M - 10 | M - 16 | M - 20 | M - 25 |
| P | P.1 | 15-20 | 0,080 | 0,100 | 0,120 | 0,150 | 0,180 |
| | P.2 | 10-15 | 0,050 | 0,060 | 0,080 | 0,100 | 0,120 |
| | P.5 | 4-8 | 0,040 | 0,050 | 0,060 | 0,080 | 0,090 |
| K | K.1 | 10-20 | 0,100 | 0,120 | 0,150 | 0,180 | 0,200 |
| S | | 8-12 | 0,040 | 0,050 | 0,060 | 0,080 | 0,090 |
| N | N.1 | 20-30 | 0,080 | 0,100 | 0,120 | 0,150 | 0,180 |
| | N.2 | 20-30 | 0,110 | 0,130 | 0,160 | 0,190 | 0,210 |
| | N.5 | 8-12 | 0,110 | 0,130 | 0,160 | 0,190 | 0,210 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing} \qquad Vf\ (mm/min.) = \text{r.p.m.} \times f$$

| M | A mm | G mm | L mm | l mm | Z | CM | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **M8** | 15 | 9,00 | 130 | 20 | 3 | 2 | 42443 | **62,86** |
| **M10** | 18 | 11,00 | 140 | 25 | 3 | 2 | 42446 | **65,74** |
| **M12** | 20 | 13,50 | 140 | 25 | 3 | 2 | 42449 | **81,11** |
| **M14** | 24 | 15,50 | 150 | 30 | 4 | 2 | 42452 | **106,76** |
| **M16** | 26 | 17,50 | 180 | 35 | 4 | 3 | 42455 | **107,72** |
| **M18** | 30 | 20,00 | 180 | 35 | 4 | 3 | 42458 | **115,60** |
| **M20** | 33 | 22,00 | 190 | 40 | 4 | 3 | 42461 | **137,57** |
| **M22** | 36 | 24,00 | 190 | 40 | 4 | 3 | 42464 | **153,26** |
| **M24** | 40 | 26,00 | 190 | 40 | 4 | 3 | 42467 | **168,46** |

HSSE
V

# MACHOS DE VANADIO
## Vanadium Taps
## Tarauds vanadium

Ref. 3143
Pág. 216

Ref. 3243
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Ref. 3153
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Ref. 3253
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# 04.

## ROSCADO
Threading
Taraudage


**MACHOS MÁQUINA MÉTRICA**
Metric Machine Taps
Tarauds machine métrique 209

**MACHOS MÁQUINA MÉTRICA ISO**
ISO Metric Machine Taps
Tarauds machine métrique ISO 246

**SETS MACHOS**
Tap Sets
Jeux de tarauds 253

**MACHOS MANO MÉTRICA**
Metric Hand Taps
Tarauds à main métrique 260

**MACHOS UNC**
UNC Taps
Tarauds UNC 273

**MACHOS UNF**
UNF Taps
Tarauds UNF 279

**MACHOS UNEF-UN-NPT**
UNEF-UN-NPT Taps
Tarauds UNEF-UN-NPT 285

**MACHOS BSW (Whitworth) BSP (GAS)-BSPT (RC)-PG**
BSW (Whitworth)- BSP (GAS) BSPT (RC)-PG Taps
Tarauds BSW (Whitworth)-BSP (GAZ) BSPT (RC)-PG 288

**COJINETES MANO / MÁQUINA**
Hand / Machine Dies
Filières à main / machine 299

**ACCESORIOS ROSCADO**
Threading Accessories
Accessoires Taraudage 311

**REPARADORES ROSCAS**
Thread Repairs
Filets rapportes 318

# DIÁMETROS DE TALADRADO Y EJES PREVIOS AL ROSCADO

Drilling & Axis Diameters Before Threading

Diametres Taraudage et axes Pré-Taraudage

| M | | | |
|---|---|---|---|
| M | P | Ø | Ø |
| 1 | 0,25 | 0,75 | 0,97 |
| 1,1 | 0,25 | 0,85 | 1,07 |
| 1,2 | 0,25 | 0,95 | 1,17 |
| 1,4 | 0,30 | 1,10 | 1,36 |
| 1,6 | 0,35 | 1,25 | 1,54 |
| 1,7 | 0,35 | 1,30 | 1,64 |
| 1,8 | 0,35 | 1,45 | 1,74 |
| 2 | 0,40 | 1,60 | 1,93 |
| 2,2 | 0,45 | 1,75 | 2,13 |
| 2,3 | 0,40 | 1,90 | 2,23 |
| 2,5 | 0,45 | 2,05 | 2,43 |
| 2,6 | 0,45 | 2,10 | 2,53 |
| 3 | 0,50 | 2,50 | 2,92 |
| 3,5 | 0,60 | 2,90 | 3,41 |
| 4 | 0,70 | 3,30 | 3,91 |
| 4,5 | 0,75 | 3,70 | 4,41 |
| 5 | 0,80 | 4,20 | 4,90 |
| 6 | 1,00 | 5,00 | 5,88 |
| 7 | 1,00 | 6,00 | 6,88 |
| 8 | 1,25 | 6,80 | 7,87 |
| 9 | 1,25 | 7,80 | 8,87 |
| 10 | 1,50 | 8,50 | 9,85 |
| 11 | 1,50 | 9,50 | 10,85 |
| 12 | 1,75 | 10,20 | 11,83 |
| 14 | 2,00 | 12,00 | 13,82 |
| 16 | 2,00 | 14,00 | 15,82 |
| 18 | 2,50 | 15,50 | 17,79 |
| 20 | 2,50 | 17,50 | 19,79 |
| 22 | 2,50 | 19,50 | 21,79 |
| 24 | 3,00 | 21,00 | 23,77 |
| 27 | 3,00 | 24,00 | 26,77 |
| 30 | 3,50 | 26,50 | 29,73 |
| 33 | 3,50 | 29,50 | 32,73 |
| 36 | 4,00 | 32,00 | 35,70 |
| 39 | 4,00 | 35,00 | 38,70 |
| 42 | 4,50 | 37,50 | 41,69 |
| 45 | 4,50 | 40,50 | 44,69 |
| 48 | 5,00 | 43,00 | 47,66 |
| 52 | 5,00 | 47,00 | 51,66 |
| 56 | 5,50 | 50,50 | 55,56 |
| 60 | 5,50 | 54,50 | 59,56 |
| 64 | 6,00 | 58,00 | 63,52 |
| 68 | 6,00 | 62,00 | 67,52 |

| MF | | | |
|---|---|---|---|
| MF | P | Ø | Ø |
| 2,5 | 0,35 | 2,15 | 2,44 |
| 3 | 0,35 | 2,65 | 2,94 |
| 3,5 | 0,35 | 3,15 | 3,44 |
| 4 | 0,35 | 3,65 | 3,94 |
| 4 | 0,50 | 3,50 | 3,93 |
| 4,5 | 0,50 | 4,00 | 4,43 |
| 5 | 0,50 | 4,50 | 4,93 |
| 5,5 | 0,50 | 5,00 | 5,43 |
| 6 | 0,50 | 5,50 | 5,93 |
| 6 | 0,75 | 5,20 | 5,90 |
| 7 | 0,75 | 6,20 | 6,90 |
| 8 | 0,50 | 7,50 | 7,93 |
| 8 | 0,75 | 7,20 | 7,90 |
| 8 | 1,00 | 7,00 | 7,88 |
| 9 | 0,75 | 8,20 | 8,90 |
| 9 | 1,00 | 8,00 | 8,88 |
| 10 | 0,50 | 9,50 | 9,93 |
| 10 | 0,75 | 9,20 | 9,90 |
| 10 | 1,00 | 9,00 | 9,88 |
| 10 | 1,25 | 8,80 | 9,86 |
| 11 | 0,75 | 10,20 | 10,90 |
| 11 | 1,00 | 10,00 | 10,88 |
| 12 | 0,75 | 11,25 | 11,90 |
| 12 | 1,00 | 11,00 | 11,88 |
| 12 | 1,25 | 10,80 | 11,86 |
| 12 | 1,50 | 10,50 | 11,85 |
| 13 | 1,00 | 12,00 | 12,88 |
| 13 | 1,50 | 11,50 | 12,85 |
| 13 | 1,75 | 11,25 | 12,83 |
| 14 | 1,00 | 13,00 | 13,88 |
| 14 | 1,25 | 12,80 | 13,86 |
| 14 | 1,50 | 12,50 | 13,85 |
| 15 | 1,00 | 14,00 | 14,88 |
| 15 | 2,00 | 13,00 | 14,82 |
| 16 | 1,00 | 15,00 | 15,88 |
| 16 | 1,50 | 14,50 | 15,85 |
| 17 | 1,00 | 16,00 | 16,88 |
| 17 | 1,50 | 15,50 | 16,85 |
| 18 | 1,00 | 17,00 | 17,88 |
| 18 | 1,50 | 16,50 | 17,85 |
| 18 | 2,00 | 16,00 | 17,82 |
| 20 | 1,00 | 19,00 | 19,88 |
| 20 | 1,50 | 18,50 | 19,85 |
| 20 | 2,00 | 18,00 | 19,82 |
| 22 | 1,00 | 21,00 | 21,88 |
| 22 | 1,50 | 20,50 | 21,85 |
| 22 | 2,00 | 20,00 | 21,82 |
| 24 | 1,00 | 23,00 | 23,88 |

| MF | | | |
|---|---|---|---|
| MF | P | Ø | Ø |
| 24 | 1,50 | 22,50 | 23,85 |
| 24 | 2,00 | 22,00 | 23,82 |
| 25 | 1,00 | 24,00 | 24,88 |
| 25 | 1,50 | 23,50 | 24,85 |
| 25 | 2,00 | 23,00 | 25,82 |
| 26 | 1,00 | 25,00 | 25,88 |
| 26 | 1,50 | 24,50 | 25,85 |
| 27 | 1,00 | 26,00 | 26,88 |
| 27 | 1,50 | 25,50 | 26,85 |
| 27 | 2,00 | 25,00 | 26,82 |
| 28 | 1,00 | 27,00 | 27,88 |
| 28 | 1,50 | 26,50 | 27,85 |
| 28 | 2,00 | 26,00 | 27,82 |
| 30 | 1,00 | 29,00 | 29,88 |
| 30 | 1,50 | 28,50 | 29,85 |
| 30 | 2,00 | 28,00 | 29,82 |
| 30 | 3,00 | 27,00 | 29,77 |
| 32 | 1,50 | 30,50 | 31,85 |
| 32 | 2,00 | 30,00 | 31,82 |
| 33 | 1,50 | 31,50 | 32,85 |
| 33 | 2,00 | 31,00 | 32,82 |
| 33 | 3,00 | 30,00 | 32,77 |
| 34 | 1,50 | 32,50 | 33,85 |
| 35 | 1,50 | 33,50 | 34,85 |
| 36 | 1,50 | 34,50 | 35,85 |
| 36 | 2,00 | 34,00 | 35,82 |
| 36 | 3,00 | 33,00 | 35,76 |
| 38 | 1,50 | 36,50 | 37,85 |
| 39 | 1,50 | 37,50 | 38,85 |
| 39 | 2,00 | 37,00 | 38,82 |
| 39 | 3,00 | 36,00 | 38,76 |
| 40 | 1,50 | 38,50 | 39,85 |
| 40 | 2,00 | 38,00 | 39,82 |
| 40 | 3,00 | 37,00 | 39,76 |
| 42 | 1,50 | 40,50 | 41,85 |
| 42 | 2,00 | 40,00 | 41,82 |
| 42 | 3,00 | 39,00 | 41,76 |
| 45 | 1,50 | 43,50 | 44,85 |
| 45 | 2,00 | 43,00 | 44,82 |
| 45 | 3,00 | 42,00 | 44,76 |
| 48 | 1,50 | 46,50 | 47,85 |
| 48 | 2,00 | 46,00 | 47,82 |
| 48 | 3,00 | 45,00 | 47,76 |
| 50 | 1,50 | 48,50 | 49,85 |
| 50 | 2,00 | 48,00 | 49,82 |
| 50 | 3,00 | 47,00 | 49,76 |
| 52 | 1,50 | 50,50 | 51,85 |
| 52 | 2,00 | 50,00 | 51,82 |
| 52 | 3,00 | 49,00 | 51,76 |

| LAMINACIÓN Cold Forming - Réfouleur | | |
|---|---|---|
| M | P | Ø |
| 3 | 0,50 | 2,75 |
| 4 | 0,70 | 3,65 |
| 4,5 | 0,75 | 4,15 |
| 5 | 0,80 | 4,60 |
| 5 | 0,90 | 4,55 |
| 6 | 1,00 | 5,50 |
| 7 | 1,00 | 6,50 |
| 8 | 1,25 | 7,40 |
| 10 | 1,50 | 9,30 |
| 12 | 1,75 | 11,20 |
| 14 | 2,00 | 13,10 |
| 16 | 2,00 | 15,10 |
| 18 | 2,50 | 16,90 |
| 20 | 2,50 | 18,90 |
| 22 | 2,50 | 20,90 |
| 24 | 3,00 | 22,65 |

| LAMINACIÓN Cold Forming - Réfouleur | | |
|---|---|---|
| UNC | HILOS Threads Filets | Ø |
| N°5 | 40 | 2,90 |
| N°6 | 32 | 3,15 |
| N°8 | 32 | 3,80 |
| N°10 | 24 | 4,35 |
| N°12 | 24 | 5,00 |
| 1/4 | 20 | 5,75 |
| 5/16 | 18 | 7,30 |
| 3/8 | 16 | 8,80 |
| 7/16 | 14 | 10,25 |
| 1/2 | 13 | 11,80 |
| 5/8 | 11 | 14,80 |

| LAMINACIÓN Cold Forming - Réfouleur | | |
|---|---|---|
| UNF | HILOS Threads Filets | Ø |
| N°5 | 44 | 2,92 |
| N°6 | 40 | 3,22 |
| N°8 | 36 | 3,85 |
| N°10 | 32 | 4,45 |
| N°12 | 28 | 5,10 |
| 1/4 | 28 | 5,95 |
| 5/16 | 24 | 7,45 |
| 3/8 | 24 | 9,05 |
| 7/16 | 20 | 10,55 |
| 1/2 | 20 | 12,15 |
| 5/8 | 18 | 15,25 |
| 3/4 | 16 | 18,35 |

Ref. 3130 Ref. 3159 Ref. 3171

# DIÁMETROS DE TALADRADO Y EJES PREVIOS AL ROSCADO
## Drilling & Axis Diameters Before Threading
## Diametres Taraudage et axes Pré-Taraudage

| BSW (Whitworth) | | | |
|---|---|---|---|
| BSW | HILOS Threads Filets | Ø | Ø |
| 3/32 | 48 | 1,80 | 2,21 |
| 1/8 | 40 | 2,50 | 3,00 |
| 5/32 | 32 | 3,10 | 3,78 |
| 3/16 | 24 | 3,60 | 4,57 |
| 7/32 | 24 | 4,40 | 5,36 |
| 1/4 | 20 | 5,10 | 6,16 |
| 5/16 | 18 | 6,50 | 7,76 |
| 3/8 | 16 | 7,90 | 9,30 |
| 7/16 | 14 | 9,30 | 10,89 |
| 1/2 | 12 | 10,50 | 12,43 |
| 9/16 | 12 | 12,00 | 13,92 |
| 5/8 | 11 | 13,50 | 15,62 |
| 3/4 | 10 | 16,50 | 18,76 |
| 7/8 | 9 | 19,25 | 21,89 |
| 1 | 8 | 22,00 | 25,08 |
| 1 1/8 | 7 | 24,75 | 28,21 |
| 1 1/4 | 7 | 27,75 | 31,36 |
| 1 3/8 | 6 | 30,50 | 34,51 |
| 1 1/2 | 6 | 33,50 | 37,66 |
| 1 5/8 | 5 | 35,50 | 40,81 |
| 1 3/4 | 5 | 39,00 | 43,96 |
| 1 7/8 | 4,5 | 41,50 | 47,11 |
| 2 | 4,5 | 44,50 | 50,26 |
| 2 1/4 | 4 | 50,00 | 56,56 |
| 2 1/2 | 4 | 56,00 | 62,87 |
| 2 3/4 | 3,5 | 62,00 | 69,85 |
| 3 | 3,5 | 68,50 | 76,20 |

| UNC | | | |
|---|---|---|---|
| UNC | HILOS Threads Filets | Ø | Ø |
| N°1 | 64 | 1,50 | 1,79 |
| N°2 | 56 | 1,80 | 2,12 |
| N°3 | 48 | 2,10 | 2,44 |
| N°4 | 40 | 2,30 | 2,76 |
| N°5 | 40 | 2,60 | 3,09 |
| N°6 | 32 | 2,85 | 3,41 |
| N°8 | 32 | 3,50 | 4,07 |
| N°10 | 24 | 3,90 | 4,71 |
| N°12 | 24 | 4,50 | 5,37 |
| 1/4 | 20 | 5,20 | 6,22 |
| 5/16 | 18 | 6,60 | 7,80 |
| 3/8 | 16 | 8,00 | 9,37 |
| 7/16 | 14 | 9,40 | 10,95 |
| 1/2 | 13 | 10,75 | 12,52 |
| 9/16 | 12 | 12,25 | 14,10 |
| 5/8 | 11 | 13,50 | 15,68 |
| 3/4 | 10 | 16,50 | 18,84 |
| 7/8 | 9 | 19,50 | 22,00 |
| 1 | 8 | 22,25 | 25,16 |
| 1 1/8 | 7 | 25,00 | 28,31 |
| 1 1/4 | 7 | 28,25 | 31,49 |
| 1 3/8 | 6 | 30,75 | 34,63 |
| 1 1/2 | 6 | 34,00 | 37,81 |
| 1 3/4 | 5 | 39,50 | 44,12 |
| 2 | 4,5 | 45,25 | 50,45 |
| 2 1/4 | 4,5 | 51,20 | 56,80 |
| 2 1/2 | 4 | 57,25 | 63,10 |
| 2 3/4 | 4 | 63,50 | 69,45 |
| 3 | 4 | 70,00 | 75,80 |

| UNF | | | |
|---|---|---|---|
| UNF | HILOS Threads Filets | Ø | Ø |
| N°0 | 80 | 1,30 | 1,47 |
| N°1 | 72 | 1,60 | 1,79 |
| N°2 | 64 | 1,90 | 2,12 |
| N°3 | 56 | 2,10 | 2,44 |
| N°4 | 48 | 2,40 | 2,77 |
| N°5 | 44 | 2,70 | 3,10 |
| N°6 | 40 | 3,00 | 3,42 |
| N°8 | 36 | 3,50 | 4,08 |
| N°10 | 32 | 4,10 | 4,73 |
| N°12 | 28 | 4,70 | 5,38 |
| 1/4 | 28 | 5,50 | 6,24 |
| 5/16 | 24 | 6,90 | 7,82 |
| 3/8 | 24 | 8,50 | 9,41 |
| 7/16 | 20 | 9,90 | 10,98 |
| 1/2 | 20 | 11,50 | 12,56 |
| 9/16 | 18 | 12,90 | 14,14 |
| 5/8 | 18 | 14,50 | 15,73 |
| 3/4 | 16 | 17,50 | 18,89 |
| 7/8 | 14 | 20,40 | 22,05 |
| 1 | 12 | 23,30 | 25,21 |
| 1 1/8 | 12 | 26,50 | 28,38 |
| 1 1/4 | 12 | 29,50 | 31,56 |
| 1 3/8 | 12 | 32,70 | 34,73 |
| 1 1/2 | 12 | 36,50 | 37,91 |

| BSP (GAS) | | | |
|---|---|---|---|
| Gas | HILOS Threads Filets | Ø | Ø |
| 1/8 | 28 | 8,80 | 9,62 |
| 1/4 | 19 | 11,80 | 13,03 |
| 3/8 | 19 | 15,25 | 16,53 |
| 1/2 | 14 | 19,00 | 20,81 |
| 5/8 | 14 | 21,00 | 22,77 |
| 3/4 | 14 | 24,50 | 26,30 |
| 7/8 | 14 | 28,25 | 30,06 |
| 1 | 11 | 30,75 | 33,07 |
| 1 1/8 | 11 | 35,50 | 37,71 |
| 1 1/4 | 11 | 39,50 | 41,73 |
| 1 3/8 | 11 | 42,00 | 44,14 |
| 1 1/2 | 11 | 45,20 | 47,62 |
| 1 3/4 | 11 | 51,40 | 53,56 |
| 2 | 11 | 57,20 | 59,43 |
| 2 1/4 | 11 | 63,30 | 65,48 |
| 2 3/8 | 11 | 67,00 | 69,15 |
| 2 1/2 | 11 | 72,80 | 74,94 |
| 2 3/4 | 11 | 79,10 | 81,27 |
| 3 | 11 | 85,50 | 87,57 |

| BSPT (RC) | | | |
|---|---|---|---|
| BSPT | HILOS Threads Filets | Ø | |
| 1/16 | 28 | 6,30 | |
| 1/8 | 28 | 8,30 | |
| 1/4 | 19 | 11,00 | |
| 3/8 | 19 | 14,50 | |
| 1/2 | 14 | 18,10 | |
| 3/4 | 14 | 23,50 | |
| 1 | 11 | 29,60 | |
| 1 1/4 | 11 | 38,10 | |
| 1 1/2 | 11 | 44,00 | |
| 2 | 11 | 55,60 | |

| UNEF | | | |
|---|---|---|---|
| UNEF | HILOS Threads Filets | Ø | Ø |
| N°12 | 32 | 4,70 | 5,39 |
| 1/4 | 32 | 5,55 | 6,25 |
| 5/16 | 32 | 7,15 | 7,84 |
| 3/8 | 32 | 8,70 | 9,42 |
| 7/16 | 28 | 10,20 | 11,00 |
| 1/2 | 28 | 11,80 | 12,59 |
| 9/16 | 24 | 13,20 | 14,18 |
| 5/8 | 24 | 14,80 | 15,75 |
| 3/4 | 20 | 17,80 | 18,91 |
| 7/8 | 20 | 20,95 | 22,09 |
| 1 | 20 | 24,10 | 25,26 |
| 1 1/8 | 18 | 27,15 | 28,40 |
| 1 1/4 | 18 | 30,35 | 31,59 |
| 1 3/8 | 18 | 33,60 | 34,76 |
| 1 1/2 | 18 | 36,70 | 37,94 |

| PG | | | |
|---|---|---|---|
| PG | HILOS Threads Filets | Ø | Ø |
| 07 | 20 | 11,40 | 12,40 |
| 09 | 18 | 14,00 | 15,10 |
| 11 | 18 | 17,25 | 18,50 |
| 13,5 | 18 | 19,00 | 20,30 |
| 16 | 18 | 21,25 | 22,40 |
| 21 | 16 | 26,75 | 28,15 |
| 29 | 16 | 35,50 | 36,85 |
| 36 | 16 | 45,50 | 46,85 |
| 42 | 16 | 52,50 | 53,85 |
| 48 | 16 | 58,00 | 59,15 |

| NPT | | | |
|---|---|---|---|
| NPT | HILOS Threads Filets | Ø | Ø |
| 1/16 | 27 | 6,20 | 7,58 |
| 1/8 | 27 | 8,50 | 9,93 |
| 1/4 | 18 | 11,00 | 13,18 |
| 3/8 | 18 | 14,50 | 16,60 |
| 1/2 | 14 | 17,80 | 20,63 |
| 3/4 | 14 | 23,00 | 25,95 |
| 1 | 11,5 | 29,00 | 32,51 |
| 1 1/4 | 11,5 | 37,50 | 41,23 |
| 1 1/2 | 11,5 | 44,00 | 47,30 |
| 2 | 11,5 | 56,00 | 59,31 |

# EQUIVALENCIA ROSCAS MM
Threading Equivalence mm
Equivalence Taraudage mm

| W / UNC / UNF / UNEF | mm |
|---|---|
| 3/32 | 2,381 |
| 1/8 | 3,175 |
| 5/32 | 3,969 |
| 3/16 | 4,762 |
| 7/32 | 5,556 |
| 1/4 | 6,350 |
| 9/32 | 7,144 |
| 5/16 | 7,938 |
| 3/8 | 9,525 |
| 7/16 | 11,112 |
| 1/2 | 12,700 |
| 9/16 | 14,288 |
| 5/8 | 15,875 |
| 3/4 | 19,050 |
| 7/8 | 22,225 |
| 1 | 25,400 |
| 1 1/8 | 28,575 |
| 1 1/4 | 31,750 |
| 1 3/8 | 34,925 |
| 1 1/2 | 38,100 |
| 1 5/8 | 41,275 |
| 1 3/4 | 44,450 |
| 1 7/8 | 47,625 |
| 2 | 50,800 |

| BSP (GAS) / BSPT (RC) | mm |
|---|---|
| 1/8 | 9,728 |
| 1/4 | 13,157 |
| 3/8 | 16,662 |
| 1/2 | 20,955 |
| 5/8 | 22,911 |
| 3/4 | 26,441 |
| 7/8 | 30,201 |
| 1 | 33,249 |
| 1 1/8 | 37,897 |
| 1 1/4 | 41,910 |
| 1 3/8 | 44,323 |
| 1 1/2 | 47,803 |
| 1 5/8 | 51,988 |
| 1 3/4 | 53,746 |
| 2 | 59,614 |
| 2 1/4 | 65,710 |
| 2 3/8 | 69,390 |
| 2 1/2 | 75,184 |
| 2 3/4 | 81,534 |
| 3 | 87,844 |

| PG | mm |
|---|---|
| 07 | 12,500 |
| 09 | 15,200 |
| 11 | 18,600 |
| 13,5 | 20,400 |
| 16 | 22,500 |
| 21 | 28,300 |
| 29 | 37,000 |
| 36 | 47,000 |
| 42 | 54,000 |
| 48 | 59,300 |

| NPT | mm |
|---|---|
| 1/8 | 10,287 |
| 1/4 | 13,716 |
| 3/8 | 17,145 |
| 1/2 | 21,336 |
| 3/4 | 23,670 |
| 1 | 33,401 |
| 1 1/4 | 42,164 |
| 1 1/2 | 48,260 |
| 2 | 60,325 |
| 2 1/2 | 73,025 |
| 3 | 88,900 |

## ROTURA DE MACHOS

**La rotura de un macho, en un porcentaje muy elevado, se produce en la zona más frágil del mismo. Por ejemplo, en el caso de machos DIN 371 con mango reforzado, se da en la terminación de la zona de roscado, con más posibilidades en los casos de roscado rígido con un macho para agujeros ciegos, a la salida del mismo.**

**Para evitar en un porcentaje elevado el riesgo de rotura, hay que tener en cuenta algunas recomendaciones:**

- **Ejecutar el taladrado previo con una broca en buenas condiciones.**
- **Utilizar el macho adecuado para cada material a trabajar.**
- **Usar un porta-machos flotante Ref. 3193 con compensación radial y axial, que alinea el eje del macho respecto al eje del orificio a roscar.**
- **Usar lubricante apropiado (ver gama lubricantes pag 649)**

## BROKEN TAPS

**Breaking a tap, in a high percentage, happens in its most fragile side. For example, when using reinforced shank DIN 371 taps, this happens in the end of the threading area, most probably in rigid threading cases with a tap for blind holes, when turning it out.**

**In order to avoid this breaking risk, have in mind some recommendations:**

- **Make the previous drilling with a drill bit in good conditions.**
- **Use the proper tap for each working material**
- **Use a Ref. 3193 Floating Tap Holder with radial & axial compensation, that aligns the tap axis to the hole-to-thread axis.**
- **Use an appropriate lubricant (see range of lubricants on page 649)**

## RUPTURE DE TARAUDS

La rupture d´un taraud dans la plupart des cas se produit dans la zone la plus fragile de l´outil. Par example, dans le cas de tarauds DIN 371 avec queue renforcée, se produit dans la fin de la partie filetée, avec plus de possibilités de casse dans les filetages rigides avec tarauds pour trous borgnes a la sortie du même.

Pour éviter un haut pourcentage de casse, il faut respecter les conseils suivants:

- Pré-taraudage avec un foret en bonnes conditions.
- Employer un taraud approprié pour chaque matériel à usiner.
- Employer un porte-tarauds flottant Ref. 3193 avec compensation rayon et axiale qui aligne l´axe du taraud par rapport à l´axe du trou à tarauder.
- Utilisez un lubrifiant approprié (voir gamme de lubrifiants à la page 649)

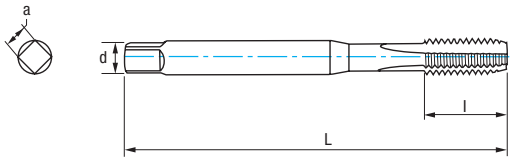
# ROSCAS Y PASOS
Threads and Pitches
Filetages et pas

| Diam. | UNC 60º | UNF 60º | UNEF 60º | UN 60º | | | | | | UNS 60º | | | | | | NPT 60º | W 55º | BF 55º | BSP (Gas) 55º | BSB BRASS 55º |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nº 0 | | 80 | | | | | | | | | | | | | | | | | | |
| Nº 1 | 64 | 72 | | | | | | | | | | | | | | | | | | |
| Nº 2 | 56 | 64 | | | | | | | | | | | | | | | | | | |
| Nº 3 | 48 | 56 | | | | | | | | | | | | | | | | | | |
| Nº 4 | 40 | 48 | | | | | | | | | | | | | | | | | | |
| Nº 5 | 40 | 44 | | | | | | | | | | | | | | | | | | |
| Nº 6 | 32 | 40 | | | | | | | | | | | | | | | | | | |
| Nº 8 | 32 | 36 | | | | | | | | | | | | | | | | | | |
| Nº 10 | 24 | 32 | | | | | | | | 28 | 36 | 40 | 48 | 56 | | | | | | |
| Nº 12 | 24 | 28 | 32 | | | | | | | 36 | 40 | 48 | 56 | | | | | | | |
| 1/16 | | | | | | | | | | | | | | | | 27 | 60 | | 28 | |
| 3/32 | | | | | | | | | | | | | | | | | 48 | | | |
| 1/8 | | | | | | | | | | | | | | | | 27 | 40 | | 28 | |
| 5/32 | | | | | | | | | | | | | | | | | 32 | | | |
| 3/16 | | | | | | | | | | | | | | | | | 24 | 32 | | |
| 7/32 | | | | | | | | | | | | | | | | | 24 | 28 | | |
| 1/4 | 20 | 28 | 32 | | | | | | | 24 | 27 | 36 | 40 | 48 | 56 | 18 | 20 | 26 | 19 | 26 |
| 9/32 | | | | | | | | | | | | | | | | | 20 | 26 | | |
| 5/16 | 18 | 24 | 32 | 20 | 28 | | | | | 27 | 36 | 40 | 48 | | | | 18 | 22 | | 26 |
| 3/8 | 16 | 24 | 32 | 20 | 28 | | | | | 18 | 27 | 36 | 40 | | | 18 | 16 | 20 | 19 | 26 |
| 7/16 | 14 | 20 | 28 | 16 | 32 | | | | | 18 | 24 | 27 | | | | | 14 | 18 | | 26 |
| 1/2 | 13 | 20 | 28 | 16 | 32 | | | | | 12 | 14 | 18 | 24 | 27 | | 14 | 12 | 16 | 14 | 26 |
| 9/16 | 12 | 18 | 24 | 16 | 20 | 28 | 32 | | | 14 | 27 | | | | | | 12 | 16 | | 26 |
| 5/8 | 11 | 18 | 24 | 12 | 16 | 20 | 28 | 32 | | 14 | 27 | | | | | 14 | 11 | 14 | 14 | 26 |
| 11/16 | | | 24 | 12 | 16 | 20 | 28 | 32 | | | | | | | | | 11 | 14 | | |
| 3/4 | 10 | 16 | 20 | 12 | 28 | 32 | | | | 14 | 18 | 24 | 27 | | | 14 | 10 | 12 | 14 | 26 |
| 13/16 | | | 20 | 12 | 16 | 28 | 32 | | | | | | | | | | 10 | 12 | | |
| 7/8 | 9 | 14 | 20 | 12 | 16 | 28 | 32 | | | 10 | 18 | 24 | 27 | | | | 9 | 11 | 14 | 26 |
| 15/16 | | | 20 | 16 | 28 | 32 | | | | | | | | | | | | | | |
| 1" | 8 | 12 | 20 | 16 | 28 | 16 | | 28 | | 10 | 14 | 18 | 24 | 27 | | 11,5 | 8 | 10 | 11 | 26 |
| 1 1/16 | | | 18 | 8 | 16 | 20 | 28 | | | | | | | | | | | | | |
| 1 1/8 | 7 | 12 | 18 | 8 | 16 | 20 | 28 | | | 10 | 14 | 24 | | | | | 7 | 9 | 11 | 26 |
| 1 3/16 | | | 18 | 8 | 16 | 20 | 28 | | | | | | | | | | | | | |
| 1 1/4 | 7 | 12 | 18 | 8 | 16 | 20 | 28 | | | 10 | 14 | 24 | | | | 11,5 | 7 | 9 | 11 | 26 |
| 1 5/16 | | | 18 | 8 | 16 | 20 | 28 | | | | | | | | | | | | | |
| 1 3/8 | 6 | 12 | 18 | 6 | 8 | 12 | 16 | 20 | 28 | 10 | 14 | 24 | | | | | 6 | 8 | 11 | 26 |
| 1 7/16 | | | 18 | 8 | 16 | 20 | 28 | | | | | | | | | | | | | |
| 1 1/2 | 6 | 12 | 18 | 6 | 8 | 16 | 20 | | | 10 | 14 | 24 | | | | 11,5 | 6 | 8 | 11 | 26 |
| 1 9/16 | | | 18 | 6 | 8 | 12 | 16 | 20 | | | | | | | | | | | | |
| 1 5/8 | | | 18 | 6 | 8 | 12 | 16 | 20 | | 10 | 14 | 24 | | | | | 5 | 8 | 11 | 26 |
| 1 11/16 | | | 18 | 6 | 8 | 12 | 16 | 20 | | | | | | | | | | | | |
| 1 3/4 | 5 | | | 6 | 8 | 12 | 16 | 20 | | 10 | 14 | 24 | | | | | 5 | 7 | 11 | 26 |
| 1 13/16 | | | | 6 | 8 | 12 | 16 | 20 | | | | | | | | | | | | |
| 1 7/8 | | | | 6 | 8 | 12 | 16 | 20 | | 10 | 14 | 24 | | | | | 4,5 | | | 26 |
| 1 15/16 | | | | 6 | 8 | 12 | 16 | 20 | | | | | | | | | | | | |
| 2" | 26 | 4,5 | | 6 | 8 | 12 | 16 | 20 | | 10 | 14 | 24 | | | | 11,5 | 4,5 | 7 | 11 | 26 |

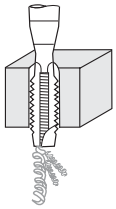
# MACHOS CON REFRIGERACIÓN INTERIOR
## Internal Cooling Taps
## Tarauds lubrification interne

# Ref. 3129

## MACHO RECTO MÁQUINA MÉTRICA REFRIGERACIÓN INTERIOR
Internal Cooling Metric Machine Straight Tap
Taraud droit machine métrique lubrification interne




PMX | HARD | DIN 371 ≤ M10 | DIN 376 > M10 | B 3,5-5h | Tol. 6HX | 60°



≤ 2D

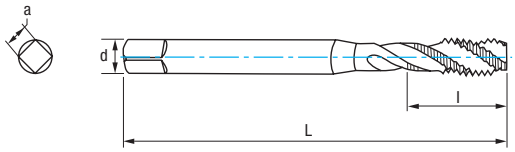
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| M6 | 1,00 | 80 | 19 | 6,00 | 4,90 | 3 | 70087 | 58,09 |
| M8 | 1,25 | 90 | 22 | 8,00 | 6,20 | 3 | 70089 | 67,29 |
| M10 | 1,50 | 100 | 24 | 10,00 | 8,00 | 3 | 70094 | 80,31 |
| M12 | 1,75 | 110 | 28 | 9,00 | 7,00 | 3 | 70101 | 102,95 |
| New! M14 | 2,00 | 110 | 30 | 11,00 | 9,00 | 3 | 70102 | 123,40 |
| M16 | 2,00 | 110 | 32 | 12,00 | 9,00 | 3 | 70163 | 147,71 |

| Material Grupo | Sub. | Vc (m/min) HARD |
|---|---|---|
| P | P.1 | 15-25 |
| | P.2 | 15-25 |
| | P.3 | 15-25 |
| | P.4 | 8-20 |
| | P.5 | 8-15 |
| M | | 8-20 |
| K | K.1 | 18-22 |
| | K.2 | 15-18 |
| N | N.1 | 10-12 |
| | N.2 | 10-12 |
| | N.3 | 20-40 |
| | N.4 | 20-40 |
| | N.5 | 15-35 |

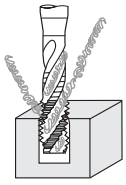
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

# Ref. 3169

## MACHO HELICOIDAL MÁQUINA MÉTRICA REFRIGERACIÓN INTERIOR
Internal Cooling Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique lubrification interne




PMX | HARD | DIN 371 ≤ M10 | DIN 376 > M10 | C 2-3h | 50° | Tol. 6H | 60°



< 2D

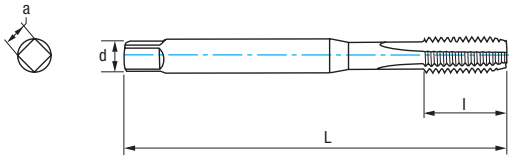
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| M6 | 1,00 | 80 | 10 | 6,00 | 4,90 | 3 | 70173 | 79,97 |
| M8 | 1,25 | 90 | 14 | 8,00 | 6,20 | 3 | 70175 | 84,90 |
| M10 | 1,50 | 100 | 16 | 10,00 | 8,00 | 3 | 70178 | 93,26 |
| M12 | 1,75 | 110 | 18 | 9,00 | 7,00 | 4 | 70182 | 110,28 |
| New! M14 | 2,00 | 110 | 20 | 11,00 | 9,00 | 4 | 70187 | 129,38 |
| M16 | 2,00 | 110 | 20 | 12,00 | 9,00 | 4 | 70195 | 152,33 |

| Material Grupo | Sub. | Vc (m/min) HARD |
|---|---|---|
| P | P.1 | 10-25 |
| | P.2 | 10-25 |
| | P.3 | 8-20 |
| | P.4 | 8-15 |
| | P.5 | 8-20 |
| M | | 8-20 |
| S | | 5-10 |
| N | N.1 | 10-12 |
| | N.2 | 10-12 |
| | N.3 | 15-35 |
| | N.4 | 15-35 |
| | N.5 | 15-35 |

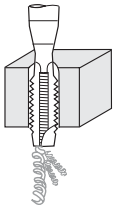
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

# Ref. 3130

## MACHO RECTO MÁQUINA MÉTRICA MATERIALES DUROS M. REFORZADO
Reinforced Shank Hard Materials Metric Machine Straight Tap
Taraud droit machine métrique matériaux durs queue renforcée




PMX | HARD | DIN 371 | B 3,5-5h | Tol. 6H | GUN | α 2-4° | 60°



≤ 2D

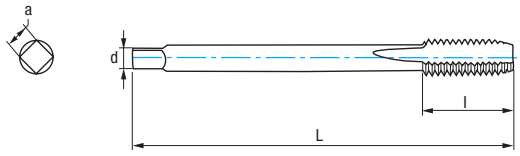
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| M3 | 0,50 | 56 | 11 | 3,50 | 2,70 | 3 | 15354 | 24,84 |
| M4 | 0,70 | 63 | 13 | 4,50 | 3,40 | 3 | 15355 | 24,84 |
| M5 | 0,80 | 70 | 16 | 6,00 | 4,90 | 3 | 15357 | 24,01 |
| M6 | 1,00 | 80 | 19 | 6,00 | 4,90 | 3 | 15360 | 26,58 |
| M8 | 1,25 | 90 | 22 | 8,00 | 6,20 | 3 | 15361 | 30,85 |
| M10 | 1,50 | 100 | 24 | 10,00 | 8,00 | 3 | 15363 | 37,56 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | HARD |
| P | P.3 | 4-8 |
| | P.4 | 3-5 |
| S | | 10-15 |
| N | N.7 | 20-30 |

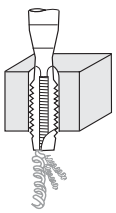
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

# Ref. 3230

## MACHO RECTO MÁQUINA MÉTRICA MATERIALES DUROS
Hard Materials Metric Machine Straight Tap
Taraud droit machine métrique matériaux durs




PMX | HARD | DIN 376 | B 3,5-5h | Tol. 6H | GUN | α 2-4° | 60°



≤ 2D

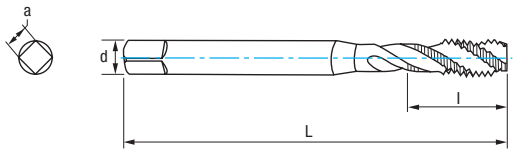
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| M12 | 1,75 | 110 | 29 | 9,00 | 7 | 3 | 16394 | 46,72 |
| M14 | 2,00 | 110 | 30 | 11,00 | 9 | 3 | 16395 | 64,66 |
| M16 | 2,00 | 110 | 32 | 12,00 | 9 | 3 | 16396 | 79,05 |
| M18 | 2,50 | 125 | 34 | 14,00 | 11 | 3 | 13216 | 148,40 |
| M20 | 2,50 | 140 | 34 | 16,00 | 12 | 3 | 13217 | 170,68 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | HARD |
| P | P.3 | 4-8 |
| | P.4 | 3-5 |
| S | | 10-15 |
| N | N.7 | 20-30 |

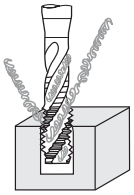
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

# Ref. 3170

## MACHO HELICOIDAL MÁQUINA MÉTRICA MATERIALES DUROS M. REFORZADO
Reinforced Shank Hard Materials Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique matériaux durs queue renforcée




PMX | HARD | DIN 371 | C 2-3h | Tol. 6H | 15° | α 4° ± 1 | 60°



≤ 2D

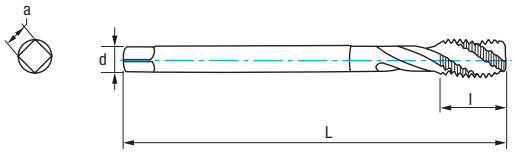
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| M3 | 0,50 | 56 | 11 | 3,50 | 2,70 | 3 | 15366 | 27,24 |
| M4 | 0,70 | 63 | 13 | 4,50 | 3,40 | 3 | 15367 | 27,24 |
| M5 | 0,80 | 70 | 16 | 6,00 | 4,90 | 3 | 15369 | 27,24 |
| M6 | 1,00 | 80 | 19 | 6,00 | 4,90 | 3 | 15372 | 28,66 |
| M8 | 1,25 | 90 | 22 | 8,00 | 6,20 | 3 | 15373 | 34,31 |
| M10 | 1,50 | 100 | 24 | 10,00 | 8,00 | 3 | 15375 | 42,62 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | HARD |
| P | P.3 | 4-8 |
| | P.4 | 3-5 |
| S | | 10-15 |
| N | N.7 | 20-30 |

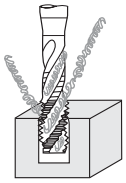
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

# Ref. 3270

## MACHO HELICOIDAL MÁQUINA MÉTRICA MATERIALES DUROS
Hard Materials Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique matériaux durs




PMX | HARD | DIN 376 | C 2-3h | Tol. 6H | 15° | α 4° ± 1 | 60°



< 2D

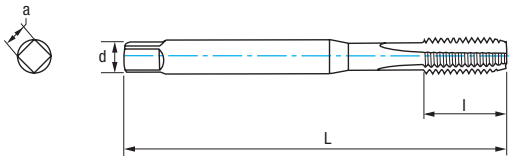
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| M12 | 1,75 | 110 | 18 | 9,00 | 7,00 | 3 | 16399 | 56,19 |
| M14 | 2,00 | 110 | 20 | 11,00 | 9,00 | 3 | 16400 | 73,71 |
| M16 | 2,00 | 110 | 20 | 12,00 | 9,00 | 4 | 16401 | 93,11 |
| M18 | 2,50 | 125 | 25 | 14,00 | 11,00 | 4 | 13218 | 127,58 |
| M20 | 2,50 | 140 | 25 | 16,00 | 12,00 | 4 | 13219 | 136,96 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | HARD |
| P | P.3 | 4-8 |
| | P.4 | 3-5 |
| S | | 10-15 |
| N | N.7 | 20-30 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

# Ref. 3125

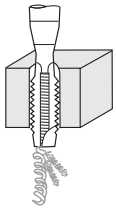
## MACHO RECTO MÁQUINA MÉTRICA INOX GRAN RENDIMIENTO M. REFORZADO
Reinforced Shank High Performance Stainless Metric Machine Straight Tap
Taraud droit machine métrique inox haut rendement queue renforcée




PMX | HARD | DIN 371 | B 3,5-5h | GUN | Tol. 6H | α 10-12°

**A.R.I.*** Alto Rendimiento Intensivo
**I.H.P.*** Intensive High Performance
H.P.I.* Haute Performance Intensif

60°



≤ 2D

**INOX**
Heavy Duty
**ACEITES DE CORTE**
Cutting Oils
Huiles de coupe
**Pág. 651**

| Material | | Vc (m/min) * |
|---|---|---|
| Grupo | Sub. | HARD |
| P | P.2 | 6-8 |
| | P.5 | 6-10 |
| M | | 8-14 |
| K | K.1 | 10-15 |
| | K.2 | 7-10 |
| N | N.1 | 10-15 |
| | N.2 | 12-20 |

*** Posible Uso en Seco: Vc -50 %**
*** Possible Dry-Use: Vc -50%**
* Emploi possible à sec: Vc -50 %

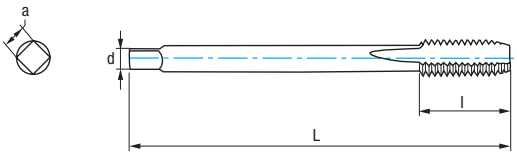
Avance **f** = **P** (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| **M2** | **0,40** | 45 | 9 | 2,80 | 2,10 | 3 | 69746 | **33,01** |
| **M3** | **0,50** | 56 | 11 | 3,50 | 2,70 | 3 | 28059 | **24,85** |
| **M4** | **0,70** | 63 | 13 | 4,50 | 3,40 | 3 | 28060 | **25,45** |
| **M5** | **0,80** | 70 | 16 | 6,00 | 4,90 | 3 | 28062 | **26,83** |
| **M6** | **1,00** | 80 | 17 | 6,00 | 4,90 | 3 | 28063 | **26,83** |
| **M8** | **1,25** | 90 | 20 | 8,00 | 6,20 | 3 | 28064 | **31,10** |
| **M10** | **1,50** | 100 | 24 | 10,00 | 8,00 | 3 | 28065 | **37,11** |

**Set**
**pag. 253**

# Ref. 3225

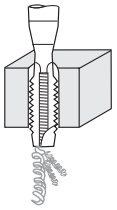
## MACHO RECTO MÁQUINA MÉTRICA/ MÉTRICA FINA INOX GRAN RENDIMIENTO
High Performance Stainless Metric / Metric Fine Machine Straight Tap
Taraud droit machine métrique / métrique pas fin inox haut rendement




PMX | HARD | M DIN 376 | MF DIN 374 | B 3,5-5h | GUN | Tol. 6H | α 10-12°

**A.R.I.*** Alto Rendimiento Intensivo
**I.H.P.*** Intensive High Performance
H.P.I.* Haute Performance Intensif

60°



≤ 2D

| Material | | Vc (m/min) * |
|---|---|---|
| Grupo | Sub. | HARD |
| P | P.2 | 6-8 |
| | P.5 | 6-10 |
| M | | 8-14 |
| K | K.1 | 10-15 |
| | K.2 | 7-10 |
| N | N.1 | 10-15 |
| | N.2 | 12-20 |

*** Posible Uso en Seco: Vc -50 %**
*** Possible Dry-Use: Vc -50%**
* Emploi possible à sec: Vc -50 %

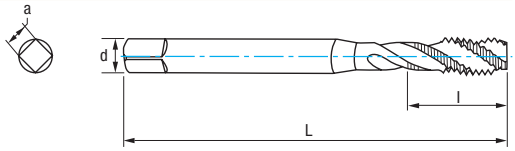
Avance **f** = **P** (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

| M/MF | P | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| MF8 | 1,00 | 90 | 18 | 6 | 4,90 | 3 | 70265 | **42,86** |
| MF10 | 1,00 | 90 | 20 | 7 | 5,50 | 3 | 70268 | **45,63** |
| MF10 | 1,25 | 100 | 20 | 7 | 5,50 | 3 | 70270 | **45,63** |
| MF12 | 1,00 | 100 | 21 | 9 | 7,00 | 3 | 70198 | **58,80** |
| MF12 | 1,25 | 100 | 21 | 9 | 7,00 | 3 | 70200 | **58,80** |
| MF12 | 1,50 | 100 | 21 | 9 | 7,00 | 3 | 70202 | **58,80** |
| **M12** | **1,75** | 110 | 29 | 9 | 7,00 | 3 | 28073 | **47,27** |
| MF14 | 1,25 | 100 | 21 | 11 | 9,00 | 3 | 70203 | **72,45** |
| MF14 | 1,50 | 100 | 21 | 11 | 9,00 | 3 | 70204 | **74,47** |
| **M14** | **2,00** | 110 | 25 | 11 | 9,00 | 3 | 38383 | **61,52** |
| MF16 | 1,50 | 100 | 21 | 12 | 9,00 | 3 | 70205 | **77,15** |
| **M16** | **2,00** | 110 | 25 | 12 | 9,00 | 3 | 38384 | **68,48** |

| M/MF | P | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| MF18 | 1,50 | 110 | 24 | 14 | 11,00 | 3 | 70211 | **86,31** |
| **M18** | **2,50** | 125 | 30 | 14 | 11,00 | 3 | 38385 | **109,89** |
| MF20 | 1,50 | 125 | 24 | 16 | 12,00 | 3 | 70214 | **94,37** |
| **M20** | **2,50** | 140 | 30 | 16 | 12,00 | 3 | 38386 | **116,82** |
| MF22 | 1,50 | 125 | 24 | 18 | 14,50 | 3 | 70217 | **107,59** |
| **M22** | **2,50** | 140 | 30 | 18 | 14,50 | 3 | 69633 | **139,32** |
| MF24 | 1,50 | 140 | 26 | 18 | 14,50 | 4 | 70220 | **135,32** |
| **M24** | **3,00** | 160 | 36 | 18 | 14,50 | 4 | 69635 | **131,03** |
| **M27** | **3,00** | 160 | 30 | 20 | 16,00 | 4 | 69636 | **211,52** |
| MF30 | 1,50 | 150 | 28 | 22 | 18,00 | 4 | 70221 | **204,74** |
| **M30** | **3,50** | 180 | 40 | 22 | 18,00 | 4 | 69638 | **231,65** |

# Ref. 3165

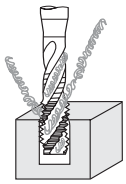
## MACHO HELICOIDAL MÁQUINA MÉTRICA INOX GRAN RENDIMIENTO M. REFORZADO
## Reinforced Shank High Performance Stainless Metric Machine Spiral Tap
## Taraud hélicoïdal machine métrique inox haut rendement queue renforcée




PMX | HARD | DIN 371 | C 2-3h | 35° | Tol. 6H | α 12° ± 2

**A.R.I.*** Alto Rendimiento Intensivo
**I.H.P.*** Intensive High Performance
H.P.I.* Haute Performance Intensif

60°



< 2D

| Material | | Vc (m/min) * |
|---|---|---|
| Grupo | Sub. | HARD |
| P | P.2 | 6-8 |
| | P.5 | 6-10 |
| M | | 8-14 |
| K | K.1 | 10-15 |
| | K.2 | 7-10 |
| N | N.1 | 10-15 |
| | N.2 | 12-20 |

* Posible Uso en Seco: Vc -50 %
* Possible Dry-Use: Vc -50%
* Emploi possible à sec: Vc -50 %

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| **M2** | **0,40** | 45 | 9 | 2,80 | 2,10 | 3 | 69745 | **38,03** |
| **M2,5** | **0,45** | 50 | 7,5 | 2,80 | 2,10 | 2 | 81703 | **38,03** |
| **M3** | **0,50** | 56 | 9 | 3,50 | 2,70 | 3 | 28066 | **28,50** |
| **M4** | **0,70** | 63 | 12 | 4,50 | 3,40 | 3 | 28068 | **28,50** |
| **M5** | **0,80** | 70 | 13 | 6,00 | 4,90 | 3 | 28069 | **29,19** |
| **M6** | **1,00** | 80 | 15 | 6,00 | 4,90 | 3 | 28070 | **30,42** |
| **M8** | **1,25** | 90 | 18 | 8,00 | 6,20 | 3 | 28071 | **35,36** |
| **M10** | **1,50** | 100 | 20 | 10,00 | 8,00 | 3 | 28072 | **41,78** |

**Set** pag. 253

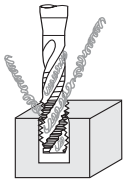
# Ref. 3265

## MACHO HELICOIDAL MÁQUINA MÉTRICA/ MÉTRICA FINA INOX GRAN RENDIMIENTO
## High Performance Stainless Metric / Metric Fine Machine Spiral Tap
## Taraud hélicoïdal machine métrique / métrique pas fin inox haut rendement

PMX | HARD | M DIN 376 | MF DIN 374 | C 2-3h | 35° | Tol. 6H | α 12° ± 2

**A.R.I.*** Alto Rendimiento Intensivo
**I.H.P.*** Intensive High Performance
H.P.I.* Haute Performance Intensif

60°



< 2D

| Material | | Vc (m/min) * |
|---|---|---|
| Grupo | Sub. | HARD |
| P | P.2 | 6-8 |
| | P.5 | 6-10 |
| M | | 8-14 |
| K | K.1 | 10-15 |
| | K.2 | 7-10 |
| N | N.1 | 10-15 |
| | N.2 | 12-20 |

* Posible Uso en Seco: Vc -50 %
* Possible Dry-Use: Vc -50%
* Emploi possible à sec: Vc -50 %

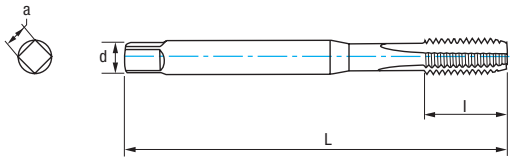
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

| M/MF | P | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| MF8 | 1,00 | 90 | 13 | 6 | 4,90 | 3 | 70271 | **43,01** |
| MF10 | 1,00 | 90 | 12 | 7 | 5,50 | 3 | 70273 | **45,63** |
| MF10 | 1,25 | 100 | 15 | 7 | 5,50 | 3 | 70274 | **45,63** |
| MF12 | 1,00 | 100 | 14 | 9 | 7,00 | 3 | 69661 | **59,02** |
| MF12 | 1,25 | 100 | 14 | 9 | 7,00 | 3 | 69664 | **59,02** |
| MF12 | 1,50 | 100 | 14 | 9 | 7,00 | 3 | 69668 | **59,02** |
| **M12** | **1,75** | 110 | 18 | 9 | 7,00 | 3 | 28074 | **56,65** |
| MF14 | 1,25 | 100 | 16 | 11 | 9,00 | 3 | 69670 | **74,68** |
| MF14 | 1,50 | 100 | 16 | 11 | 9,00 | 3 | 69671 | **74,68** |
| **M14** | **2,00** | 110 | 20 | 11 | 9,00 | 3 | 38379 | **68,10** |
| MF16 | 1,50 | 100 | 16 | 12 | 9,00 | 4 | 69673 | **77,82** |
| **M16** | **2,00** | 110 | 20 | 12 | 9,00 | 4 | 38380 | **82,38** |

| M/MF | P | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| MF18 | 1,50 | 110 | 20 | 14 | 11,00 | 4 | 69675 | **86,76** |
| **M18** | **2,50** | 125 | 25 | 14 | 11,00 | 4 | 38381 | **117,21** |
| MF20 | 1,50 | 125 | 20 | 16 | 12,00 | 4 | 69676 | **94,81** |
| **M20** | **2,50** | 140 | 25 | 16 | 12,00 | 4 | 38382 | **123,75** |
| MF22 | 1,50 | 125 | 20 | 18 | 14,50 | 4 | 69678 | **110,92** |
| **M22** | **2,50** | 140 | 25 | 18 | 14,50 | 4 | 69621 | **148,20** |
| MF24 | 1,50 | 140 | 22 | 18 | 14,50 | 4 | 69681 | **139,53** |
| **M24** | **3,00** | 160 | 30 | 18 | 14,50 | 4 | 69172 | **141,06** |
| **M27** | **3,00** | 160 | 30 | 20 | 16,00 | 4 | 69622 | **216,45** |
| MF30 | 1,50 | 150 | 26 | 22 | 18,00 | 3 | 69683 | **211,10** |
| **M30** | **3,50** | 180 | 35 | 22 | 18,00 | 4 | 69623 | **236,67** |

# Ref. 3149

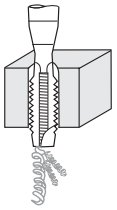
## MACHO RECTO MÁQUINA MÉTRICA INOX MANGO REFORZADO
Reinforced Shank Stainless Metric Machine Straight Tap
Taraud droit machine métrique inox queue renforcée




HSSE 5% Co | TIN | DIN 371 | B 3,5-5h | GUN | Tol. 6H | α 10-12° | 60°

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TIN |
| P | P.5 | 5-8 |
| M | | 8-12 |
| N | N.1 | 8-12 |
| | N.2 | 12-20 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

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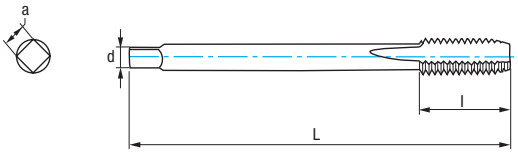
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|---|
| **M2** | **0,40** | 45 | 8 | 2,80 | 2,10 | 3 | 81347 | **26,83** |
| **M2,5** | **0,45** | 50 | 9 | 2,80 | 2,10 | 3 | 81348 | **25,63** |
| **M3** | **0,50** | 56 | 11 | 3,50 | 2,70 | 3 | 21834 | **18,53** |
| **M4** | **0,70** | 63 | 13 | 4,50 | 3,40 | 3 | 21835 | **18,77** |
| **M5** | **0,80** | 70 | 16 | 6,00 | 4,90 | 3 | 21836 | **19,46** |
| **M6** | **1,00** | 80 | 17 | 6,00 | 4,90 | 3 | 21837 | **19,59** |
| **M8** | **1,25** | 90 | 20 | 8,00 | 6,20 | 3 | 21838 | **22,81** |
| **M10** | **1,50** | 100 | 24 | 10,00 | 8,00 | 3 | 21839 | **26,55** |

# Ref. 3249

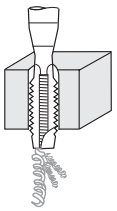
## MACHO RECTO MÁQUINA MÉTRICA/ MÉTRICA FINA INOX
Stainless Metric / Metric Fine Machine Straight Tap
Taraud droit machine métrique / métrique pas fin inox




HSSE 5% Co | TIN | M DIN 376 | MF DIN 374 | B 3,5-5h | GUN | Tol. 6H | α 10-12° | 60°

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TIN |
| P | P.5 | 5-8 |
| M | | 8-12 |
| N | N.1 | 8-12 |
| | N.2 | 12-20 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$




| M/MF | P | L mm | l mm | d mm | a mm | Z | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|---|
| MF6 | 0,75 | 80 | 15 | 4,5 | 3,40 | 3 | 81396 | **26,80** |
| MF8 | 1,00 | 90 | 18 | 6 | 4,90 | 3 | 81397 | **27,07** |
| **M8** | **1,25** | 90 | 20 | 6 | 4,90 | 3 | 21840 | **25,12** |
| MF10 | 1,00 | 90 | 20 | 7 | 5,50 | 3 | 81398 | **31,55** |
| **M10** | **1,50** | 100 | 22 | 7 | 5,50 | 3 | 21841 | **28,72** |
| MF12 | 1,00 | 100 | 21 | 9 | 7,00 | 3 | 81399 | **39,41** |
| MF12 | 1,50 | 100 | 21 | 9 | 7,00 | 3 | 81400 | **36,46** |
| **M12** | **1,75** | 110 | 24 | 9 | 7,00 | 3 | 21843 | **33,93** |
| MF14 | 1,50 | 100 | 21 | 11 | 9,00 | 3 | 81401 | **45,92** |
| **M14** | **2,00** | 110 | 26 | 11 | 9,00 | 3 | 21844 | **44,23** |
| MF16 | 1,50 | 100 | 21 | 12 | 9,00 | 3 | 81402 | **52,54** |
| **M16** | **2,00** | 110 | 27 | 12 | 9,00 | 3 | 21846 | **48,77** |
| MF18 | 1,50 | 110 | 24 | 14 | 11,00 | 3 | 81403 | **65,88** |
| **M18** | **2,50** | 125 | 30 | 14 | 11,00 | 3 | 21847 | **75,98** |
| MF20 | 1,50 | 125 | 24 | 16 | 12,00 | 3 | 81405 | **100,86** |
| **M20** | **2,50** | 140 | 32 | 16 | 12,00 | 3 | 21848 | **79,08** |
| **M22** | **2,50** | 140 | 34 | 18 | 14,50 | 3 | 16268 | **101,57** |
| **M24** | **3,00** | 160 | 36 | 18 | 14,50 | 4 | 16269 | **85,73** |
| **M27** | **3,00** | 160 | 36 | 20 | 16,00 | 4 | 81351 | **119,91** |
| **M30** | **3,50** | 180 | 40 | 22 | 18,00 | 4 | 81352 | **144,73** |
| **M33** | **3,50** | 180 | 42 | 25 | 20,00 | 4 | 81353 | **220,53** |
| **M36** | **4,00** | 200 | 50 | 28 | 22,00 | 4 | 81354 | **296,35** |

INOX Heavy Duty
ACEITES DE CORTE
Cutting Oils
Huiles de coupe
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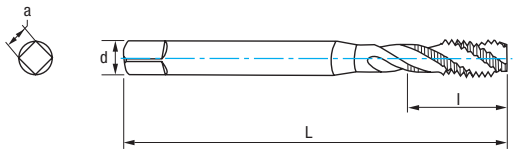
# Ref. 3159

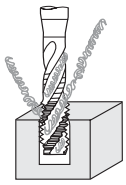
## MACHO HELICOIDAL MÁQUINA MÉTRICA INOX MANGO REFORZADO
Reinforced Shank Stainless Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique inox queue renforcée




HSSE 5% Co | TIN | DIN 371 | C 2-3h | 35° | Tol. 6H | α 10-12° | 60°

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TIN |
| P | P.5 | 5-8 |
| M | | 8-12 |
| N | N.1 | 8-12 |
| | N.2 | 12-20 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$


< 2D

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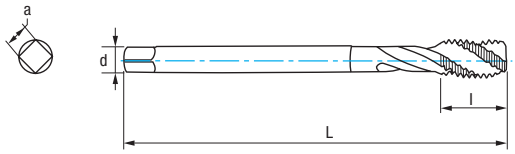
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|---|
| M2 | 0,40 | 45 | 6 | 2,80 | 2,10 | 3 | 81349 | 29,52 |
| M2,5 | 0,45 | 50 | 7,5 | 2,80 | 2,10 | 3 | 81350 | 28,19 |
| M3 | 0,50 | 56 | 5 | 3,50 | 2,70 | 3 | 21849 | 20,16 |
| M4 | 0,70 | 63 | 7 | 4,50 | 3,40 | 3 | 21850 | 20,16 |
| M5 | 0,80 | 70 | 8 | 6,00 | 4,90 | 3 | 21851 | 20,63 |
| M6 | 1,00 | 80 | 10 | 6,00 | 4,90 | 3 | 21852 | 21,54 |
| M8 | 1,25 | 90 | 13 | 8,00 | 6,20 | 3 | 21853 | 24,92 |
| M10 | 1,50 | 100 | 15 | 10,00 | 8,00 | 3 | 21854 | 29,29 |

# Ref. 3259

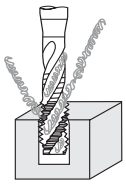
## MACHO HELICOIDAL MÁQUINA MÉTRICA INOX
Stainless Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique inox




HSSE 5% Co | TIN | DIN 376 | C 2-3h | 35° | Tol. 6H | α 10-12° | 60°

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TIN |
| P | P.5 | 5-8 |
| M | | 8-12 |
| N | N.1 | 8-12 |
| | N.2 | 12-20 |

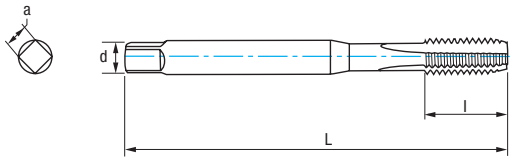
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$


< 2D

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|---|
| M8 | 1,25 | 90 | 13 | 6,00 | 4,90 | 3 | 21855 | 26,40 |
| M10 | 1,50 | 100 | 15 | 7,00 | 5,50 | 3 | 21856 | 33,04 |
| M12 | 1,75 | 110 | 18 | 9,00 | 7,00 | 3 | 21857 | 38,46 |
| M14 | 2,00 | 110 | 20 | 11,00 | 9,00 | 3 | 21858 | 48,06 |
| M16 | 2,00 | 110 | 20 | 12,00 | 9,00 | 3 | 21859 | 52,82 |
| M18 | 2,50 | 125 | 25 | 14,00 | 11,00 | 3 | 21860 | 76,23 |
| M20 | 2,50 | 140 | 25 | 16,00 | 12,00 | 3 | 21861 | 78,78 |
| M22 | 2,50 | 140 | 25 | 18,00 | 14,50 | 3 | 16270 | 104,06 |
| M24 | 3,00 | 160 | 30 | 18,00 | 14,50 | 4 | 16271 | 99,02 |

# Ref. 3143

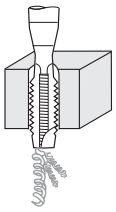
## MACHO RECTO MÁQUINA MÉTRICA MATERIALES ALEADOS M. REFORZADO
Reinforced Shank Alloy Materials Metric Machine Straight Tap
Taraud droit machine métrique matériaux alliages queue renforcée




HSSE V | DIN 371 | B 3,5-5h | GUN | Tol. 6H | α 10-12° | 60° | **Vaporizado** Vaporized Vaporisée

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | HSSE-V |
| P | P.2 | 6-8 |
| M | | 8-12 |
| K | K.2 | 7-10 |
| N | N.5 | 14-20 |

**Avance f = P (Paso - Pitch - Pas)**
**Vf (mm/min.) = r.p.m. x f**
**r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$**



≤ 2D

| | M | P | L mm | l mm | d mm | a mm | Z | N° Art. HSSE-V | € |
|---|---|---|---|---|---|---|---|---|---|
| New! | M1 | 0,25 | 40 | 5 | 2,50 | 2,10 | 2 | 58965 | 48,05 |
| New! | M1,6 | 0,35 | 40 | 8 | 2,50 | 2,10 | 2 | 58967 | 47,19 |
| New! | M2 | 0,40 | 45 | 8 | 2,80 | 2,10 | 2 | 58970 | 18,49 |
| New! | M2,5 | 0,45 | 50 | 9 | 2,80 | 2,10 | 2 | 58973 | 20,61 |
| | M3 | 0,50 | 56 | 11 | 3,50 | 2,70 | 3 | 69532 | 14,16 |
| | M4 | 0,70 | 63 | 13 | 4,50 | 3,40 | 3 | 69534 | 14,47 |
| | M5 | 0,80 | 70 | 16 | 6,00 | 4,90 | 3 | 69535 | 14,47 |
| | M6 | 1,00 | 80 | 19 | 6,00 | 4,90 | 3 | 69537 | 15,91 |
| | M8 | 1,25 | 90 | 22 | 8,00 | 6,20 | 3 | 69538 | 17,84 |
| | M10 | 1,50 | 100 | 24 | 10,00 | 8,00 | 3 | 15672 | 20,56 |

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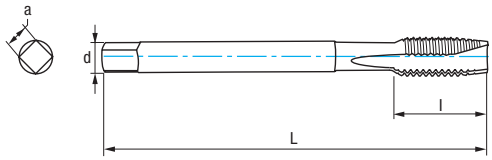
# Ref. 3243

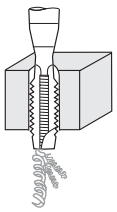
## MACHO RECTO MÁQUINA MÉTRICA MATERIALES ALEADOS
Alloy Materials Metric Machine Straight Tap
Taraud droit machine métrique matériaux alliages




HSSE V | DIN 376 | B 3,5-5h | GUN | Tol. 6H | α 10-12° | 60° | **Vaporizado** Vaporized Vaporisée

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | HSSE-V |
| P | P.2 | 6-8 |
| M | | 8-12 |
| K | K.2 | 7-10 |
| N | N.5 | 14-20 |

**Avance f = P (Paso - Pitch - Pas)**
**Vf (mm/min.) = r.p.m. x f**
**r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$**

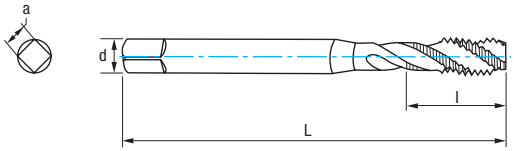


≤ 2D

| | M | P | L mm | l mm | d mm | a mm | Z | N° Art. HSSE-V | € |
|---|---|---|---|---|---|---|---|---|---|
| | M8 | 1,25 | 90 | 22 | 6,00 | 4,90 | 3 | 69876 | 18,66 |
| | M10 | 1,50 | 100 | 24 | 7,00 | 5,50 | 3 | 69877 | 22,94 |
| | M12 | 1,75 | 110 | 28 | 9,00 | 7,00 | 3 | 69879 | 28,24 |
| New! | MF14 | 1,50 | 100 | 22 | 11,00 | 9,00 | 3 | 82761 | 41,70 |
| | M14 | 2,00 | 110 | 30 | 11,00 | 9,00 | 3 | 69880 | 35,34 |
| | M16 | 2,00 | 110 | 32 | 12,00 | 9,00 | 3 | 69882 | 41,55 |
| | M18 | 2,50 | 125 | 34 | 14,00 | 11,00 | 3 | 69883 | 58,89 |
| | M20 | 2,50 | 140 | 34 | 16,00 | 12,00 | 3 | 69885 | 63,58 |
| New! | M22 | 2,50 | 140 | 34 | 18,00 | 14,50 | 3 | 58976 | 73,38 |
| New! | M24 | 3,00 | 160 | 38 | 18,00 | 14,50 | 3 | 58979 | 78,02 |

# Ref. 3153

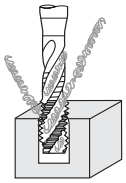
## MACHO HELICOIDAL MÁQUINA MÉTRICA MATERIALES ALEADOS M. REFORZADO
Reinforced Shank Alloy Materials Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique matériaux alliages queue renforcée




| HSSE V | DIN 371 | C 2-3h | 40° | Tol. 6H | α 6° ± 1 | 60° | Vaporizado Vaporized Vaporisée |
|---|---|---|---|---|---|---|---|

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | HSSE-V |
| P | P.2 | 6-8 |
| M | | 8-12 |
| K | K.2 | 7-10 |
| N | N.5 | 14-20 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$


< 2D

| | M | P | L mm | l mm | d mm | a mm | Z | N° Art. HSSE-V | € |
|---|---|---|---|---|---|---|---|---|---|
| New! | M1 | 0,25 | 40 | 5 | 2,50 | 2,10 | 2 | 58982 | 52,86 |
| New! | M1,6 | 0,35 | 40 | 7 | 2,50 | 2,10 | 2 | 58985 | 51,91 |
| New! | M2 | 0,40 | 45 | 4 | 2,80 | 2,10 | 2 | 58988 | 21,30 |
| | M2,5 | 0,45 | 50 | 4,5 | 2,80 | 2,10 | 2 | 58991 | 21,30 |
| | M3 | 0,50 | 56 | 5 | 3,50 | 2,70 | 3 | 69412 | 15,59 |
| | M4 | 0,70 | 63 | 7 | 4,50 | 3,40 | 3 | 69414 | 15,94 |
| | M5 | 0,80 | 70 | 8 | 6,00 | 4,90 | 3 | 69415 | 15,94 |
| | M6 | 1,00 | 80 | 10 | 6,00 | 4,90 | 3 | 69483 | 17,48 |
| | M8 | 1,25 | 90 | 13 | 8,00 | 6,20 | 3 | 69484 | 19,62 |
| | M10 | 1,50 | 100 | 15 | 10,00 | 8,00 | 3 | 69519 | 22,61 |

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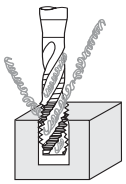
# Ref. 3253

## MACHO HELICOIDAL MÁQUINA MÉTRICA MATERIALES ALEADOS
Alloy Materials Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique matériaux alliages

| HSSE V | DIN 376 | C 2-3h | 40° | Tol. 6H | α 6° ± 1 | 60° | Vaporizado Vaporized Vaporisée |
|---|---|---|---|---|---|---|---|

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | HSSE-V |
| P | P.2 | 6-8 |
| M | | 8-12 |
| K | K.2 | 7-10 |
| N | N.5 | 14-20 |

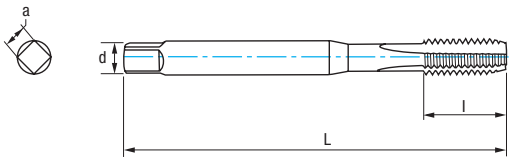
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$


< 2D

| | M | P | L mm | l mm | d mm | a mm | Z | N° Art. HSSE-V | € |
|---|---|---|---|---|---|---|---|---|---|
| | M8 | 1,25 | 90 | 13 | 6,00 | 4,90 | 3 | 69864 | 20,52 |
| | M10 | 1,50 | 100 | 15 | 7,00 | 5,50 | 3 | 69865 | 25,25 |
| | M12 | 1,75 | 110 | 18 | 9,00 | 7,00 | 4 | 69867 | 31,09 |
| | M14 | 2,00 | 110 | 20 | 11,00 | 9,00 | 4 | 69868 | 38,87 |
| | M16 | 2,00 | 110 | 20 | 12,00 | 9,00 | 4 | 69870 | 45,71 |
| | M18 | 2,50 | 125 | 25 | 14,00 | 11,00 | 4 | 69871 | 64,77 |
| | M20 | 2,50 | 140 | 25 | 16,00 | 12,00 | 4 | 69873 | 69,98 |
| New! | M22 | 2,50 | 140 | 25 | 18,00 | 14,50 | 4 | 58994 | 78,99 |
| New! | M24 | 3,00 | 160 | 30 | 18,00 | 14,50 | 4 | 58997 | 82,99 |

# Ref. 3176

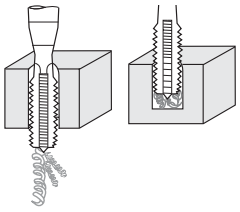
## MACHO RECTO MÁQUINA MÉTRICA FUNDICIÓN MANGO REFORZADO
Reinforced Shank Cast Iron Metric Machine Straight Tap
Taraud droit machine métrique fonte queue renforcée




HSSE 5% Co | **TICN** | DIN 371 | C 2-3h | Tol. 6HX | α 1-3° | 60°

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TICN |
| K | K.1 | 15-20 |
| | K.2 | 10-15 |

Avance **f** = **P** (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

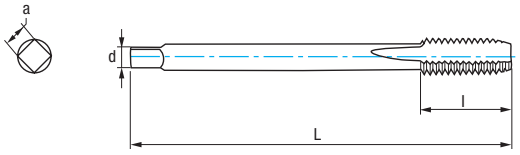


≤ 1,5D

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. TICN | € |
|---|---|---|---|---|---|---|---|---|
| **M3** | **0,50** | 56 | 10 | 3,50 | 2,70 | 3 | 19680 | **16,26** |
| **M4** | **0,70** | 63 | 12 | 4,50 | 3,40 | 3 | 19681 | **16,57** |
| **M5** | **0,80** | 70 | 14 | 6,00 | 4,90 | 3 | 19682 | **16,57** |
| **M6** | **1,00** | 80 | 16 | 6,00 | 4,90 | 4 | 19683 | **18,84** |
| **M8** | **1,25** | 90 | 18 | 8,00 | 6,20 | 4 | 19685 | **21,16** |
| **M10** | **1,50** | 100 | 20 | 10,00 | 8,00 | 4 | 19686 | **24,17** |

# Ref. 3276

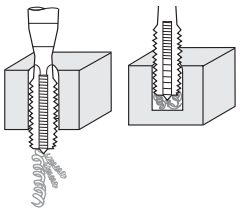
## MACHO RECTO MÁQUINA MÉTRICA FUNDICIÓN
Cast Iron Metric Machine Straight Tap
Taraud droit machine métrique fonte




HSSE 5% Co | **TICN** | DIN 376 | C 2-3h | Tol. 6HX | α 1-3° | 60°

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TICN |
| K | K.1 | 15-20 |
| | K.2 | 10-15 |

Avance **f** = **P** (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

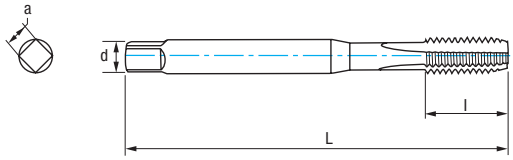


≤ 1,5D

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. TICN | € |
|---|---|---|---|---|---|---|---|---|
| **M6** | **1,00** | 80 | 16 | 4,50 | 3,40 | 4 | 19687 | **19,65** |
| **M8** | **1,25** | 90 | 18 | 6,00 | 4,90 | 4 | 19688 | **22,06** |
| **M10** | **1,50** | 100 | 20 | 7,00 | 5,50 | 4 | 19690 | **25,31** |
| **M12** | **1,75** | 110 | 22 | 9,00 | 7,00 | 4 | 19691 | **30,11** |
| **M14** | **2,00** | 110 | 25 | 11,00 | 9,00 | 4 | 19694 | **49,50** |
| **M16** | **2,00** | 110 | 28 | 12,00 | 9,00 | 4 | 19696 | **58,24** |
| **M18** | **2,50** | 125 | 32 | 14,00 | 11,00 | 4 | 19697 | **83,78** |
| **M20** | **2,50** | 140 | 32 | 16,00 | 12,00 | 4 | 19698 | **84,11** |

# Ref. 3172

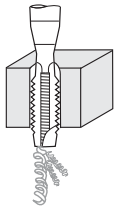
## MACHO RECTO MÁQUINA MÉTRICA ALUMINIO MANGO REFORZADO
Reinforced Shank Aluminium Metric Machine Straight Tap
Taraud droit machine métrique aluminium queue renforcée




| HSSE 5%Co | DIN 371 | B 3,5-5h | GUN | | Tol. 6H | α 10-12° | 60° |
|---|---|---|---|---|---|---|---|

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| N | N.3 | 15-35 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

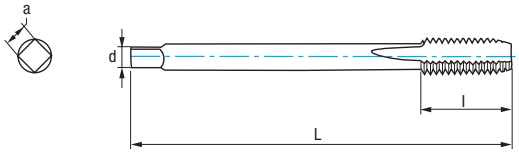


≤ 2D

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **M3** | **0,50** | 56 | 11 | 3,50 | 2,70 | 3 | 14557 | **19,46** |
| **M4** | **0,70** | 63 | 13 | 4,50 | 3,40 | 3 | 14574 | **19,55** |
| **M5** | **0,80** | 70 | 16 | 6,00 | 4,90 | 3 | 14745 | **19,46** |
| **M6** | **1,00** | 80 | 19 | 6,00 | 4,90 | 3 | 14725 | **20,52** |
| **M8** | **1,25** | 90 | 22 | 8,00 | 6,20 | 3 | 14746 | **24,59** |
| **M10** | **1,50** | 100 | 24 | 10,00 | 8,00 | 3 | 14737 | **28,93** |

# Ref. 3272

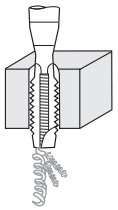
## MACHO RECTO MÁQUINA MÉTRICA ALUMINIO
Aluminium Metric Machine Straight Tap
Taraud droit machine métrique aluminium




| HSSE 5%Co | DIN 376 | B 3,5-5h | GUN | | Tol. 6H | α 10-12° | 60° |
|---|---|---|---|---|---|---|---|

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| N | N.3 | 15-35 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

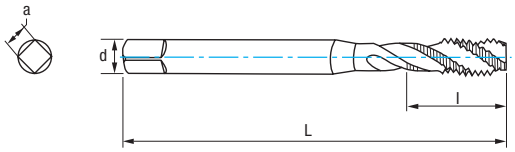


≤ 2D

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **M12** | **1,75** | 110 | 29 | 9,00 | 7,00 | 3 | 14751 | **36,10** |
| **M14** | **2,00** | 110 | 30 | 11,00 | 9,00 | 3 | 14761 | **65,43** |
| **M16** | **2,00** | 110 | 32 | 12,00 | 9,00 | 3 | 14764 | **71,32** |
| **M18** | **2,50** | 125 | 30 | 14,00 | 11,00 | 4 | 14767 | **92,30** |
| **M20** | **2,50** | 140 | 32 | 16,00 | 12,00 | 4 | 14773 | **98,20** |

# Ref. 3175

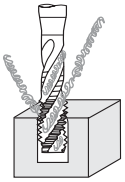
## MACHO HELICOIDAL MÁQUINA MÉTRICA ALUMINIO MANGO REFORZADO
Reinforced Shank Aluminium Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique aluminium queue renforcée




| HSSE 5%Co | DIN 371 | C 2-3h | 45° | Tol. 6H | α 16° ± 2 | 60° |
|---|---|---|---|---|---|---|

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| N | N.3 | 15-35 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$



< 2D

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **M3** | **0,50** | 56 | 11 | 3,50 | 2,70 | 2 | 14565 | **21,64** |
| **M4** | **0,70** | 63 | 13 | 4,50 | 3,40 | 2 | 14577 | **21,71** |
| **M5** | **0,80** | 70 | 16 | 6,00 | 4,90 | 2 | 14724 | **21,64** |
| **M6** | **1,00** | 80 | 19 | 6,00 | 4,90 | 2 | 14730 | **22,81** |
| **M8** | **1,25** | 90 | 22 | 8,00 | 6,20 | 2 | 14733 | **27,32** |
| **M10** | **1,50** | 100 | 24 | 10,00 | 8,00 | 2 | 14739 | **32,15** |

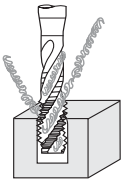
# Ref. 3275

## MACHO HELICOIDAL MÁQUINA MÉTRICA ALUMINIO
Aluminium Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique aluminium

| HSSE 5%Co | DIN 376 | C 2-3h | 45° | Tol. 6H | α 16° ± 2 | 60° |
|---|---|---|---|---|---|---|

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| N | N.3 | 15-35 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

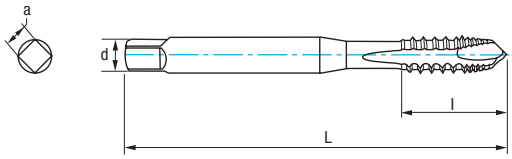


< 2D

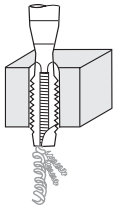
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **M12** | **1,75** | 110 | 29 | 9,00 | 7,00 | 2 | 14755 | **40,14** |
| **M14** | **2,00** | 110 | 30 | 11,00 | 9,00 | 3 | 14763 | **72,67** |
| **M16** | **2,00** | 110 | 32 | 12,00 | 9,00 | 3 | 14766 | **79,26** |
| **M18** | **2,50** | 125 | 30 | 14,00 | 11,00 | 3 | 14769 | **102,56** |
| **M20** | **2,50** | 140 | 32 | 16,00 | 12,00 | 3 | 14775 | **109,10** |

# Ref. 3174

## MACHO RECTO MÁQUINA MÉTRICA ALUMINIO M. REFORZADO DENTADO ALTERNO
Interrupted Thread Reinforced Shank Aluminium Metric Machine Straight Tap
Taraud droit machine métrique aluminium queue renforcée denture alternée




HSSE 5%Co | DIN 371 | B 3,5-5h | GUN | Tol. 6H | α 17-20° | 60°



≤ 2D

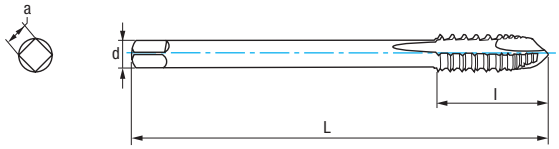
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M3 | 0,50 | 56 | 11 | 3,50 | 2,70 | 3 | 69390 | 20,42 |
| M4 | 0,70 | 63 | 13 | 4,50 | 3,40 | 3 | 69393 | 20,42 |
| M5 | 0,80 | 70 | 16 | 6,00 | 4,90 | 3 | 69394 | 20,42 |
| M6 | 1,00 | 80 | 19 | 6,00 | 4,90 | 3 | 69396 | 21,50 |
| M8 | 1,25 | 90 | 22 | 8,00 | 6,20 | 3 | 69397 | 25,72 |
| M10 | 1,50 | 100 | 24 | 10,00 | 8,00 | 3 | 69399 | 30,30 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 20-25 |
| | P.2 | 8-18 |
| | P.5 | 8-10 |
| M | | 8-10 |
| N | N.1 | 10-25 |
| | N.2 | 10-25 |
| | N.3 | 12-25 |
| | N.4 | 12-25 |
| | N.5 | 15-20 |
| | N.6 | 20-25 |

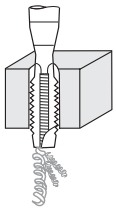
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

# Ref. 3274

## MACHO RECTO MÁQUINA MÉTRICA ALUMINIO DENTADO ALTERNO
Interrupted Thread Aluminium Metric Machine Straight Tap
Taraud droit machine métrique aluminium denture alternée




HSSE 5%Co | DIN 376 | B 3,5-5h | GUN | Tol. 6H | α 17-20° | 60°



≤ 2D

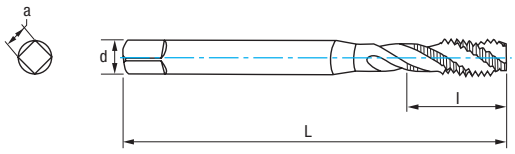
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M5 | 0,80 | 70 | 16 | 3,50 | 2,70 | 3 | 69853 | 20,42 |
| M6 | 1,00 | 80 | 19 | 4,50 | 3,40 | 3 | 69855 | 25,72 |
| M8 | 1,25 | 90 | 22 | 6,00 | 4,90 | 3 | 69856 | 25,72 |
| M10 | 1,50 | 100 | 24 | 7,00 | 5,50 | 3 | 69858 | 30,30 |
| M12 | 1,75 | 110 | 29 | 9,00 | 7,00 | 3 | 69859 | 37,83 |
| M14 | 2,00 | 110 | 30 | 11,00 | 9,00 | 3 | 69861 | 68,52 |
| M16 | 2,00 | 110 | 32 | 12,00 | 9,00 | 3 | 69862 | 68,94 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 20-25 |
| | P.2 | 8-18 |
| | P.5 | 8-10 |
| M | | 8-10 |
| N | N.1 | 10-25 |
| | N.2 | 10-25 |
| | N.3 | 12-25 |
| | N.4 | 12-25 |
| | N.5 | 15-20 |
| | N.6 | 20-25 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

# Ref. 3140

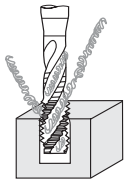
## MACHO HELICOIDAL MÁQUINA MÉTRICA COBRE/BRONCE M. REFORZADO
Reinforced Shank Copper/Bronze Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique cuivre/bronze queue renforcée




| HSSE 5% Co | DIN 371 | C 2-3h | 15° | Tol. 6H | α 10° ± 2 | 60° |
|---|---|---|---|---|---|---|

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| N | N.1 | 10-15 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

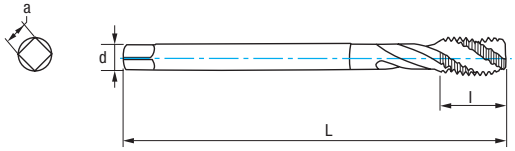


< 2D

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M3 | 0,50 | 56 | 5 | 3,50 | 2,70 | 3 | 69543 | 13,93 |
| M3,5 | 0,60 | 56 | 6 | 4,00 | 3,00 | 3 | 69411 | 20,52 |
| M4 | 0,70 | 63 | 7 | 4,50 | 3,40 | 3 | 69544 | 13,93 |
| M5 | 0,80 | 70 | 8 | 6,00 | 4,90 | 3 | 69546 | 13,34 |
| M6 | 1,00 | 80 | 10 | 6,00 | 4,90 | 3 | 69547 | 14,64 |
| M7 | 1,00 | 80 | 10 | 7,00 | 5,50 | 3 | 69520 | 22,76 |
| M8 | 1,25 | 90 | 13 | 8,00 | 6,20 | 3 | 69549 | 16,72 |
| M10 | 1,50 | 100 | 15 | 10,00 | 8,00 | 3 | 69550 | 19,81 |

# Ref. 3240

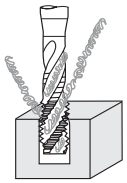
## MACHO HELICOIDAL MÁQUINA MÉTRICA COBRE/BRONCE
Copper/Bronze Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique cuivre/bronze




| HSSE 5% Co | DIN 376 | C 2-3h | 15° | Tol. 6H | α 10° ± 2 | 60° |
|---|---|---|---|---|---|---|

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| N | N.1 | 10-15 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

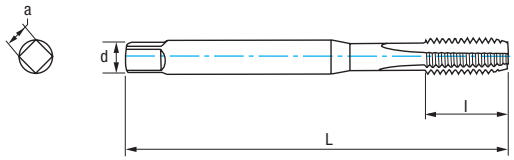


< 2D

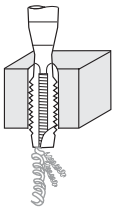
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M3 | 0,50 | 56 | 5 | 2,20 | | 3 | 69573 | 14,28 |
| M4 | 0,70 | 63 | 7 | 2,80 | 2,10 | 3 | 69574 | 15,20 |
| M5 | 0,80 | 70 | 8 | 3,50 | 2,70 | 3 | 69576 | 14,55 |
| M6 | 1,00 | 80 | 10 | 4,50 | 3,40 | 3 | 69577 | 15,97 |
| M8 | 1,25 | 90 | 13 | 6,00 | 4,90 | 3 | 69579 | 17,45 |
| M10 | 1,50 | 100 | 15 | 7,00 | 5,50 | 3 | 69844 | 20,70 |
| M12 | 1,75 | 110 | 18 | 9,00 | 7,00 | 3 | 69846 | 26,67 |
| M14 | 2,00 | 110 | 20 | 11,00 | 9,00 | 3 | 69847 | 41,86 |
| M16 | 2,00 | 110 | 20 | 12,00 | 9,00 | 3 | 69400 | 50,56 |
| M18 | 2,50 | 125 | 25 | 14,00 | 11,00 | 4 | 16267 | 72,97 |
| M20 | 2,50 | 140 | 25 | 16,00 | 12,00 | 4 | 40153 | 75,29 |

# Ref. 3120

## MACHO RECTO MÁQUINA MÉTRICA MULTIFUNCIÓN MANGO REFORZADO
Reinforced Shank Multipurpose Metric Machine Straight Tap
Taraud droit machine métrique multifonction queue renforcée




HSSE V | TIN | DIN 371 | B 3,5-5h | GUN | Tol. 6H | α 10 - 12° | 60°



≤ 2D

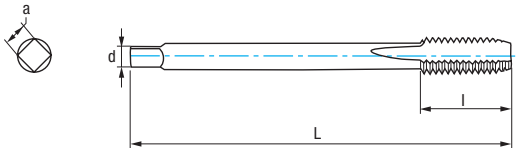
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|---|
| **M3** | **0,50** | 56 | 11 | 3,50 | 2,70 | 3 | 28046 | **24,70** |
| **M4** | **0,70** | 63 | 13 | 4,50 | 3,40 | 3 | 28047 | **25,02** |
| **M5** | **0,80** | 70 | 16 | 6,00 | 4,90 | 3 | 28048 | **26,01** |
| **M6** | **1,00** | 80 | 17 | 6,00 | 4,90 | 3 | 28049 | **26,10** |
| **M8** | **1,25** | 90 | 20 | 8,00 | 6,20 | 3 | 28050 | **30,22** |
| **M10** | **1,50** | 100 | 24 | 10,00 | 8,00 | 3 | 28051 | **35,36** |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TIN |
| P | P.1 | 10-12 |
| | P.2 | 4-6 |
| | P.5 | 4-7 |
| M | | 6-10 |
| K | K.1 | 8-12 |
| | K.2 | 7-10 |
| N | N.1 | 8-12 |
| | N.2 | 12-20 |
| | N.4 | 12-20 |
| | N.5 | 12-20 |
| | N.6 | 10-15 |

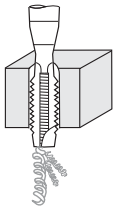
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

# Ref. 3220

## MACHO RECTO MÁQUINA MÉTRICA MULTIFUNCIÓN
Multipurpose Metric Machine Straight Tap
Taraud droit machine métrique multifonction




HSSE V | TIN | DIN 376 | B 3,5-5h | GUN | Tol. 6H | α 10 - 12° | 60°



≤ 2D

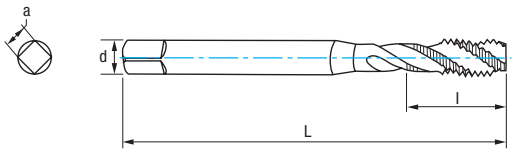
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|---|
| **M12** | **1,75** | 110 | 24 | 9,00 | 7,00 | 3 | 28075 | **44,92** |
| **M14** | **2,00** | 110 | 26 | 11,00 | 9,00 | 3 | 28077 | **58,62** |
| **M16** | **2,00** | 110 | 27 | 12,00 | 9,00 | 3 | 28079 | **64,74** |
| **M18** | **2,50** | 125 | 30 | 14,00 | 11,00 | 4 | 28081 | **92,81** |
| **M20** | **2,50** | 140 | 32 | 16,00 | 12,00 | 4 | 28083 | **95,51** |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TIN |
| P | P.1 | 10-12 |
| | P.2 | 4-6 |
| | P.5 | 4-7 |
| M | | 6-10 |
| K | K.1 | 8-12 |
| | K.2 | 7-10 |
| N | N.1 | 8-12 |
| | N.2 | 12-20 |
| | N.4 | 12-20 |
| | N.5 | 12-20 |
| | N.6 | 10-15 |

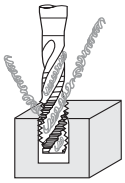
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

# Ref. 3160

## MACHO HELICOIDAL MÁQUINA MÉTRICA MULTIFUNCIÓN M. REFORZADO
Reinforced Shank Multipurpose Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique multifonction queue renforcée




HSSE V | TIN | DIN 371 | C 2-3h | 35° | Tol. 6H | α 6° ± 2 | 60°



< 2D

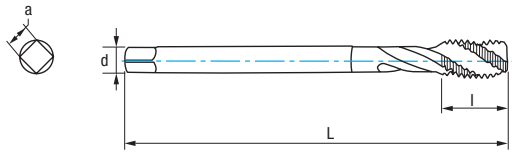
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|---|
| M3 | 0,50 | 56 | 11 | 3,50 | 2,70 | 3 | 28052 | 26,75 |
| M4 | 0,70 | 63 | 13 | 4,50 | 3,40 | 3 | 28053 | 26,75 |
| M5 | 0,80 | 70 | 16 | 6,00 | 4,90 | 3 | 28054 | 27,41 |
| M6 | 1,00 | 80 | 17 | 6,00 | 4,90 | 3 | 28055 | 28,60 |
| M8 | 1,25 | 90 | 20 | 8,00 | 6,20 | 3 | 28056 | 33,18 |
| M10 | 1,50 | 100 | 24 | 10,00 | 8,00 | 3 | 28057 | 39,05 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TIN |
| P | P.1 | 10-12 |
| | P.2 | 4-6 |
| | P.5 | 4-7 |
| M | | 6-10 |
| K | K.1 | 8-12 |
| | K.2 | 7-10 |
| N | N.1 | 8-12 |
| | N.2 | 12-20 |
| | N.4 | 12-20 |
| | N.5 | 12-20 |
| | N.6 | 10-15 |

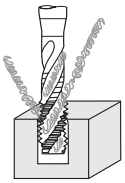
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

# Ref. 3260

## MACHO HELICOIDAL MÁQUINA MÉTRICA MULTIFUNCIÓN
Multipurpose Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique multifonction




HSSE V | TIN | DIN 376 | C 2-3h | 35° | Tol. 6H | α 6° ± 2 | 60°



< 2D

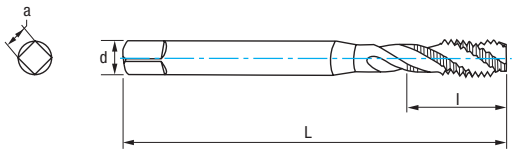
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|---|
| M12 | 1,75 | 110 | 24 | 9,00 | 7,00 | 3 | 28076 | 51,01 |
| M14 | 2,00 | 110 | 26 | 11,00 | 9,00 | 3 | 28078 | 63,74 |
| M16 | 2,00 | 110 | 27 | 12,00 | 9,00 | 4 | 28080 | 70,06 |
| M18 | 2,50 | 125 | 30 | 14,00 | 11,00 | 4 | 28082 | 100,92 |
| M20 | 2,50 | 140 | 32 | 16,00 | 12,00 | 4 | 28084 | 104,20 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TIN |
| P | P.1 | 10-12 |
| | P.2 | 4-6 |
| | P.5 | 4-7 |
| M | | 6-10 |
| K | K.1 | 8-12 |
| | K.2 | 7-10 |
| N | N.1 | 8-12 |
| | N.2 | 12-20 |
| | N.4 | 12-20 |
| | N.5 | 12-20 |
| | N.6 | 10-15 |

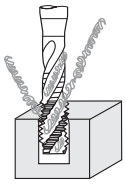
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

# Ref. 3151

## MACHO HELICOIDAL MÁQUINA MÉTRICA MANGO REFORZADO VAPORIZADO
Vaporized Reinforced Shank Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique queue renforcée vaporisée




| HSSE 5%Co | DIN 371 | C 2-3h | Tol. 6H | 35° | α 10° ± 2 | Rompe Virutas Chip Breaker Brise copeaux | 60° | Vaporizado Vaporized Vaporisée |
|---|---|---|---|---|---|---|---|---|



< 2D

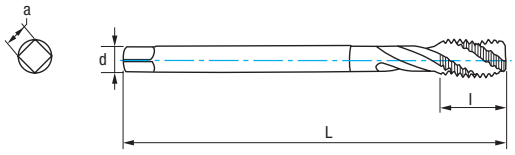
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **M3** | **0,50** | 56 | 11 | 3,50 | 2,70 | 3 | 14779 | **18,50** |
| **M4** | **0,70** | 63 | 13 | 4,50 | 3,40 | 3 | 14782 | **18,50** |
| **M5** | **0,80** | 70 | 16 | 6,00 | 4,90 | 3 | 14785 | **18,88** |
| **M6** | **1,00** | 80 | 19 | 6,00 | 4,90 | 3 | 14788 | **19,77** |
| **M8** | **1,25** | 90 | 22 | 8,00 | 6,20 | 3 | 14790 | **22,97** |
| **M10** | **1,50** | 100 | 24 | 10,00 | 8,00 | 3 | 14791 | **27,00** |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.3 | 14-20 |

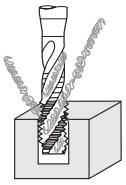
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

# Ref. 3251

## MACHO HELICOIDAL MÁQUINA MÉTRICA VAPORIZADO
Vaporized Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique vaporisée




| HSSE 5%Co | DIN 376 | C 2-3h | Tol. 6H | 35° | α 10° ± 2 | Rompe Virutas Chip Breaker Brise copeaux | 60° | Vaporizado Vaporized Vaporisée |
|---|---|---|---|---|---|---|---|---|



< 2D

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **M12** | **1,75** | 110 | 29 | 9,00 | 7,00 | 3 | 14793 | **35,29** |
| **M14** | **2,00** | 110 | 30 | 11,00 | 9,00 | 3 | 14797 | **44,05** |
| **M16** | **2,00** | 110 | 32 | 12,00 | 9,00 | 3 | 14802 | **48,38** |
| **M18** | **2,50** | 125 | 30 | 14,00 | 11,00 | 4 | 14803 | **69,17** |
| **M20** | **2,50** | 140 | 32 | 16,00 | 12,00 | 4 | 14806 | **72,15** |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.3 | 14-20 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

# MACHOS DE LAMINACIÓN
# Forming Taps
# Tarauds à réfouler

- **No generan viruta.**
- **Vida útil muy superior a machos estándar de corte.**
- **La rosca formada es más resistente dado que el material se comprime en la superficie.**

- No chips.
- Longer life than normal cutting taps.
- Formed threads are stronger because the material is compressed at the surface of it.

- Sans production de copeaux.
- Durée de vie plus longue que les tarauds de coupe standard.
- Le filetage formé est plus solide car le matériel est comprimé en surface.

**Materiales con un Coeficiente de Alargamiento de 12-14%**
**12-14% Lengthening Coefficient Materials**
Matériaux avec coéfficient de rallonge 12-14%

Ref. 3164 PMX

Pag. 227

**M**
**REFRIGERACIÓN INTERIOR** - Internal Cooling - Lubrification interne

Ref. 3171 PMX

Pag. 228

**M/MF**
**ALTO RENDIMIENTO** - High Performance - Haut rendement

Ref. 3162 PMX

Pag. 229

**M/MF**

Ref. 3173 PMX

Pag. 230

**M**
**Entrada E** - E chamfer - Entrée E

Ref. 3163 HSSE

Pag. 230

**M**

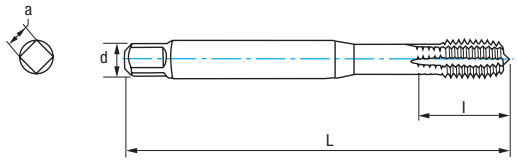
Ref. 3141 HSSE

Pag. 282

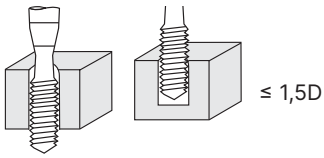
**UNC - UNF**
**ALTO RENDIMIENTO** - High Performance - Haut rendement

# Ref. 3164

## MACHO MÁQUINA MÉTRICA LAMINACIÓN REFRIGERACIÓN INTERIOR
Internal Cooling Cold Forming Metric Machine Tap
Taraud machine métrique réfouleur lubrification interne



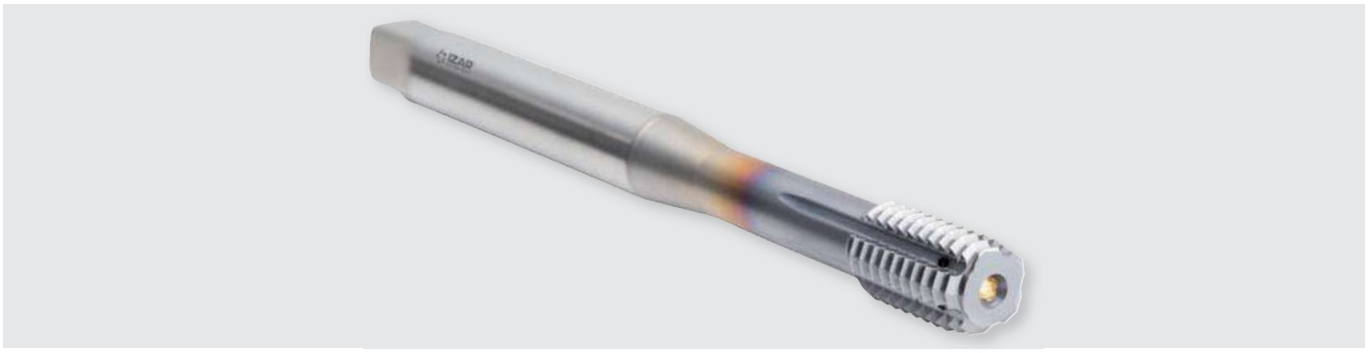

PMX | TICN | DIN 2174 | C 2-3h | Tol. 6HX | 60°




| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TICN |
| P | P.1 | 20-30 |
| | P.2 | 20-30 |
| | P.3 | 20-30 |
| | P.4 | 8-15 |
| M | | 6-12 |
| N | N.1 | 15-22 |
| | N.2 | 15-22 |
| | N.3 | 20-40 |
| | N.4 | 20-40 |
| | N.5 | 20-40 |

**Avance f = P (Paso - Pitch - Pas)**
**Vf (mm/min.) = r.p.m. x f**
**r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$**

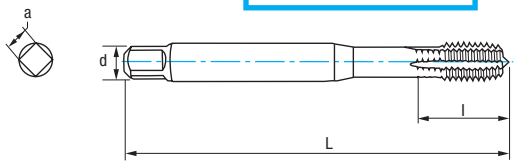
| M | P | L mm | l mm | d mm | a mm | N° Art. TICN | € |
|---|---|---|---|---|---|---|---|
| **M6** | **1,00** | 80 | 16 | 6,00 | 4,90 | 69356 | **94,55** |
| **M8** | **1,25** | 90 | 18 | 8,00 | 6,20 | 69357 | **99,72** |
| **M10** | **1,50** | 100 | 20 | 10,00 | 8,00 | 69358 | **109,34** |
| **M12** | **1,75** | 110 | 24 | 9,00 | 7,00 | 69360 | **127,60** |
| **M14** | **2,00** | 110 | 25 | 11,00 | 9,00 | 69361 | **149,27** |
| **M16** | **2,00** | 110 | 27 | 12,00 | 9,00 | 69363 | **199,03** |



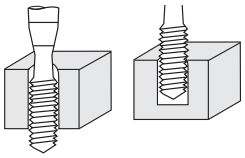
# Ref. 3171

## MACHO MÁQUINA LAMINACIÓN ALTO RENDIMIENTO
High Performance Cold Forming Machine Tap
Taraud machine réfouleur haut rendement

**ALTO RENDIMIENTO**
**High Performance**
Haut rendement




PMX | TIALN-TIN | DIN 371 ≤ M10 | DIN 376 > M10 | C 2-3h | Tol. 6HX | 60°




Video

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TIALN-TIN |
| P | P.1 | 10-30 |
| | P.2 | 10-30 |
| | P.3 | 8-15 |
| | P.5 | 10-25 |
| M | | 10-25 |
| N | N.1 | 20-40 |
| | N.2 | 20-40 |
| | N.3 | 20-40 |
| | N.4 | 20-40 |
| | N.5 | 20-40 |

Avance **f** = **P** (Paso - Pitch - Pas)

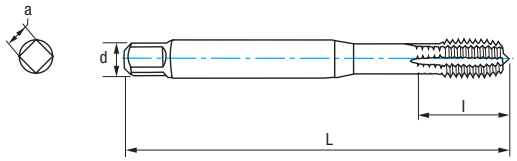
Vf (mm/min.) = r.p.m. x f

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

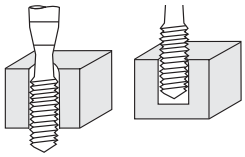
| M | P | L mm | l mm | d mm | a mm | N° Art. TIALN-TIN | € |
|---|---|---|---|---|---|---|---|
| **M2** | **0,40** | 45 | 8 | 2,80 | 2,10 | 78359 | **53,78** |
| **M2,5** | **0,45** | 50 | 9 | 2,80 | 2,10 | 78360 | **53,78** |
| **M3** | **0,50** | 56 | 10 | 3,50 | 2,70 | 67347 | **49,50** |
| MF4 | 0,50 | 63 | 7 | 4,50 | 3,40 | 78373 | **53,78** |
| **M4** | **0,70** | 63 | 7 | 4,50 | 3,40 | 67348 | **49,50** |
| MF5 | 0,50 | 70 | 8 | 6,00 | 4,90 | 78374 | **76,77** |
| **M5** | **0,80** | 70 | 8 | 6,00 | 4,90 | 67356 | **49,50** |
| MF6 | 0,50 | 80 | 10 | 6,00 | 4,90 | 78375 | **79,84** |
| MF6 | 0,75 | 80 | 10 | 7,00 | 5,50 | 78376 | **76,77** |
| **M6** | **1,00** | 80 | 10 | 6,00 | 4,90 | 67362 | **53,78** |
| MF8 | 1,00 | 90 | 13 | 8,00 | 6,20 | 67054 | **76,77** |
| **M8** | **1,25** | 90 | 13 | 8,00 | 6,20 | 65902 | **62,25** |
| MF10 | 1,00 | 90 | 10 | 9,00 | 7,00 | 78378 | **82,03** |
| MF10 | 1,25 | 100 | 15 | 10,00 | 8,00 | 67055 | **82,03** |
| **M10** | **1,50** | 100 | 15 | 10,00 | 8,00 | 67369 | **68,70** |
| MF12 | 1,00 | 100 | 10 | 9,00 | 7,00 | 78380 | **101,84** |
| MF12 | 1,25 | 100 | 15 | 9,00 | 7,00 | 67056 | **101,84** |
| MF12 | 1,50 | 100 | 15 | 9,00 | 7,00 | 78382 | **101,84** |
| **M12** | **1,75** | 110 | 18 | 9,00 | 7,00 | 68955 | **80,84** |
| MF14 | 1,50 | 100 | 15 | 9,00 | 7,00 | 67057 | **150,11** |
| **M14** | **2,00** | 110 | 20 | 11,00 | 9,00 | 68956 | **111,93** |
| MF16 | 1,50 | 100 | 15 | 12,00 | 9,00 | 67058 | **150,11** |
| **M16** | **2,00** | 110 | 20 | 12,00 | 9,00 | 68958 | **136,56** |
| **M18** | **2,50** | 125 | 32 | 14,00 | 11,00 | 78371 | **238,90** |
| MF20 | 1,50 | 125 | 17 | 16,00 | 12,00 | 83550 | **285,15** |
| **M20** | **2,50** | 140 | 32 | 16,00 | 12,00 | 78372 | **244,92** |
| MF22 | 1,50 | 125 | 17 | 18,00 | 14,50 | 83551 | **298,65** |
| **M22** | **2,50** | 140 | 25 | 18,00 | 14,50 | 83552 | **313,28** |

# Ref. 3162

## MACHO MÁQUINA MÉTRICA LAMINACIÓN
Cold Forming Metric Machine Tap
Taraud machine métrique réfouleur




PMX | TIN | DIN 2174 | C 2-3h | Tol. 6HX | 60°



≤ 1,5D

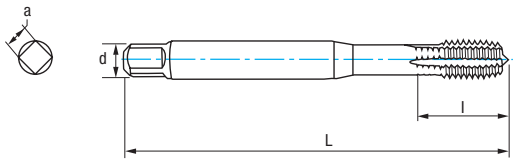
| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TIN |
| P | P.1 | 10-30 |
| | P.2 | 10-30 |
| | P.3 | 8-15 |
| | P.5 | 10-20 |
| M | | 10-20 |
| N | N.1 | 20-40 |
| | N.2 | 20-40 |
| | N.3 | 20-50 |
| | N.4 | 20-50 |
| | N.5 | 20-50 |

**Avance f =** **P** (Paso - Pitch - Pas)
**Vf (mm/min.) =** r.p.m. x f
**r.p.m. =** $\frac{Vc \times 1.000}{\pi \times ø}$

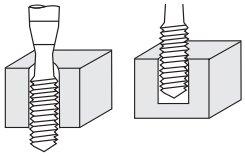
| M/MF | P | L mm | l mm | d mm | a mm | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|
| **M3** | **0,50** | 56 | 9 | 3,50 | 2,70 | 69345 | **41,19** |
| **M4** | **0,70** | 63 | 12 | 4,50 | 3,40 | 69346 | **41,19** |
| **M5** | **0,80** | 70 | 13 | 6,00 | 4,90 | 69348 | **41,19** |
| **M6** | **1,00** | 80 | 15 | 6,00 | 4,90 | 69349 | **44,40** |
| MF8 | 1,00 | 90 | 22 | 8,00 | 6,20 | 69644 | **63,95** |
| **M8** | **1,25** | 90 | 22 | 8,00 | 6,20 | 69351 | **51,86** |
| MF10 | 1,25 | 100 | 24 | 10,00 | 8,00 | 69645 | **68,56** |
| **M10** | **1,50** | 100 | 24 | 10,00 | 8,00 | 69352 | **57,64** |
| MF12 | 1,25 | 100 | 22 | 9,00 | 7,00 | 69648 | **88,96** |
| **M12** | **1,75** | 110 | 28 | 9,00 | 7,00 | 69353 | **67,86** |
| MF14 | 1,50 | 100 | 22 | 11,00 | 9,00 | 69650 | **98,18** |
| **M14** | **2,00** | 110 | 25 | 11,00 | 9,00 | 69354 | **93,50** |
| MF16 | 1,50 | 100 | 22 | 12,00 | 9,00 | 69658 | **124,40** |
| **M16** | **2,00** | 110 | 25 | 12,00 | 9,00 | 69355 | **113,62** |

# Ref. 3173

## MACHO MÉTRICA LAMINACIÓN MAT.S DUROS PUNTA PLANA
Flat Tip Hard Materials Cold Forming Metric Machine Tap
Taraud machine métrique réfouleur matériaux durs pointe plat




PMX | TICN | DIN 371 | E 1,5-2h | Tol. 6HX | 60° | ALTO RENDIMIENTO High Performance Haut rendement



≤ 1,5D

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = Vc x 1.000 / π x ø

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TICN |
| P | P.1 | 10-30 |
| | P.2 | 10-30 |
| | P.3 | 8-15 |
| | P.5 | 10-25 |
| M | | 10-25 |
| N | N.1 | 20-40 |
| | N.2 | 20-40 |
| | N.3 | 20-40 |
| | N.4 | 20-40 |
| | N.5 | 20-40 |

| M | P | L mm | l mm | d mm | a mm | N° Art. TICN | € |
|---|---|---|---|---|---|---|---|
| M3 | 0,50 | 56 | 10 | 3,50 | 2,70 | 76109 | 64,36 |
| M4 | 0,70 | 63 | 7 | 4,50 | 3,40 | 75992 | 64,36 |
| M5 | 0,80 | 70 | 8 | 6,00 | 4,90 | 76110 | 64,36 |
| M6 | 1,00 | 80 | 10 | 6,00 | 4,90 | 76111 | 69,90 |
| M8 | 1,25 | 90 | 13 | 8,00 | 6,20 | 76116 | 80,94 |
| M10 | 1,50 | 100 | 15 | 10,00 | 8,00 | 76117 | 89,30 |

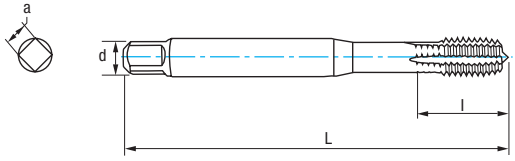
**Entrada ultra-corta para agujeros ciegos con rosca hasta el fondo, por ejemplo en paredes delgadas.**

**Ultra-short chamfer for blind holes with threads tapped to bottom, for instance in thin wall work pieces.**

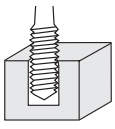
Entrée ultra-courte pour trous borgnes avec filetage jusqu'au fond, par exemple pour des parois fines.

# Ref. 3163

## MACHO MÉTRICA LAMINACIÓN
Cold Forming Metric Machine Tap
Taraud machine métrique réfouleur




HSSE 5% Co | TICN | DIN 2174 | C 2-3h | Tol. 6HX | 60°



≤ 1,5D

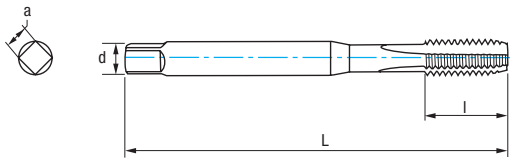
| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TICN |
| N | N.1 | 15-30 |
| | N.2 | 15-30 |
| | N.3 | 15-35 |
| | N.4 | 15-30 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = Vc x 1.000 / π x ø

| M | P | L mm | l mm | d mm | a mm | N° Art. TICN | € |
|---|---|---|---|---|---|---|---|
| M3 | 0,50 | 56 | 10 | 3,50 | 2,70 | 21818 | 34,33 |
| M3,5 | 0,60 | 56 | 11 | 4,00 | 3,00 | 21819 | 35,99 |
| M4 | 0,70 | 63 | 12 | 4,50 | 3,40 | 21820 | 34,33 |
| M5 | 0,80 | 70 | 14 | 6,00 | 4,90 | 21821 | 34,33 |
| M6 | 1,00 | 80 | 16 | 6,00 | 4,90 | 21822 | 37,00 |
| M8 | 1,25 | 90 | 18 | 8,00 | 6,20 | 21823 | 43,23 |
| M10 | 1,50 | 100 | 20 | 10,00 | 8,00 | 21824 | 48,03 |
| M12 | 1,75 | 110 | 22 | 9,00 | 7,00 | 21825 | 56,55 |

# Ref. 3100

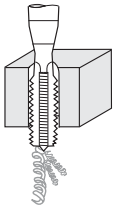
## MACHO RECTO MÁQUINA MÉTRICA MANGO REFORZADO
Reinforced Shank Metric Machine Straight Tap
Taraud droit machine métrique queue renforcée




| HSSE 5%Co | DIN 371 | B 3,5-5h | GUN | Tol. 6H | α 10 -12° | 60° |
|---|---|---|---|---|---|---|

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |



≤ 2D

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M2 | 0,40 | 45 | 9 | 2,80 | 2,10 | 3 | 62771 | 16,80 |
| M2,5 | 0,45 | 50 | 9 | 2,80 | 2,10 | 3 | 76724 | 16,80 |
| M2,6 | 0,45 | 50 | 9 | 2,80 | 2,10 | 3 | 76725 | 16,80 |
| M3 | 0,50 | 56 | 11 | 3,50 | 2,70 | 3 | 62774 | 9,53 |
| M3,5 | 0,60 | 56 | 13 | 4,00 | 3,00 | 3 | 62777 | 15,10 |
| M4 | 0,70 | 63 | 13 | 4,50 | 3,40 | 3 | 62780 | 10,07 |
| M4,5 | 0,75 | 70 | 16 | 6,00 | 4,90 | 3 | 76728 | 22,87 |
| M5 | 0,80 | 70 | 16 | 6,00 | 4,90 | 3 | 62783 | 10,07 |
| M6 | 1,00 | 80 | 19 | 6,00 | 4,90 | 3 | 62789 | 11,07 |
| M7 | 1,00 | 80 | 19 | 7,00 | 5,50 | 3 | 76733 | 17,51 |
| M8 | 1,25 | 90 | 22 | 8,00 | 6,20 | 3 | 62795 | 12,38 |
| M9 | 1,25 | 90 | 18 | 9,00 | 7,00 | 3 | 62798 | 20,68 |
| M10 | 1,50 | 100 | 24 | 10,00 | 8,00 | 3 | 62807 | 15,24 |

Set
pag. 256

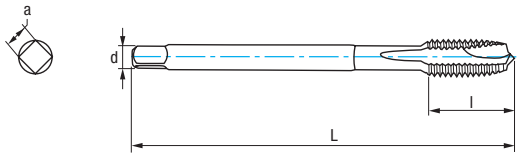
## ACEITES DE CORTE Y REFRIGERANTES
Cutting Oils & Water Soluble Fluids
Huiles de coupe et lubrifiants

Pag. 649

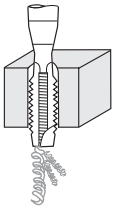
UNI Universal | INOX Heavy Duty | ALU Non Ferrous | STD Standard | TOP Top Line | MULTI Multiusos

# Ref. 3200

## MACHO RECTO MÁQUINA MÉTRICA/ MÉTRICA FINA
Metric / Metric Fine Machine Straight Tap
Taraud droit machine métrique / métrique pas fin




| HSSE 5%Co | M DIN 376 | MF DIN 374 | B 3,5-5h | GUN | Tol. 6H | α 10 -12° | 60° |
|---|---|---|---|---|---|---|---|



≤ 2D

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

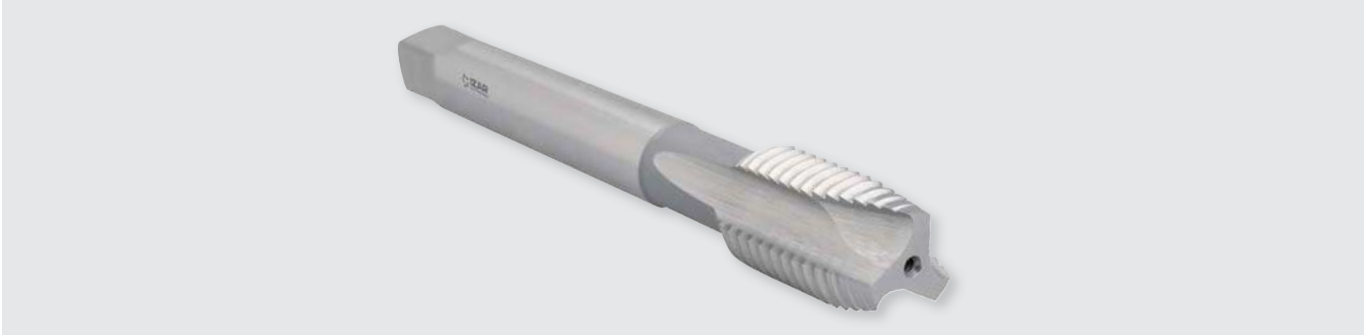
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

| M/MF | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **M3** | **0,50** | 56 | 11 | 2,20 | | | 70090 | **10,18** |
| **M4** | **0,70** | 63 | 13 | 2,80 | 2,10 | 3 | 70092 | **10,31** |
| **M5** | **0,80** | 70 | 16 | 3,50 | 2,70 | 3 | 70093 | **10,31** |
| **M6** | **1,00** | 80 | 19 | 4,50 | 3,40 | 3 | 70095 | **11,32** |
| **M7** | **1,00** | 80 | 19 | 5,50 | 4,30 | 3 | 70224 | **17,98** |
| MF8 | 0,75 | 80 | 19 | 6,00 | 4,90 | 3 | 70267 | **26,22** |
| MF8 | 1,00 | 90 | 22 | 6,00 | 4,90 | 3 | 70248 | **21,26** |
| **M8** | **1,25** | 90 | 22 | 6,00 | 4,90 | 3 | 70096 | **12,71** |
| MF10 | 1,00 | 90 | 20 | 7,00 | 5,50 | 3 | 70249 | **23,69** |
| MF10 | 1,25 | 100 | 24 | 7,00 | 5,50 | 3 | 70251 | **28,24** |
| **M10** | **1,50** | 100 | 24 | 7,00 | 5,40 | 3 | 70098 | **15,66** |
| **M11** | **1,50** | 100 | 24 | 8,00 | 6,20 | 3 | 70225 | **30,21** |
| MF12 | 1,00 | 100 | 22 | 9,00 | 7,00 | 3 | 70252 | **31,20** |
| MF12 | 1,25 | 100 | 22 | 9,00 | 7,00 | 3 | 70254 | **31,51** |
| MF12 | 1,50 | 100 | 22 | 9,00 | 7,00 | 3 | 70255 | **28,15** |
| **M12** | **1,75** | 110 | 29 | 9,00 | 7,00 | 3 | 70183 | **19,29** |
| MF14 | 1,00 | 100 | 22 | 11,00 | 9,00 | 3 | 70281 | **47,83** |
| MF14 | 1,25 | 100 | 22 | 11,00 | 9,00 | 3 | 70257 | **41,92** |
| MF14 | 1,50 | 100 | 22 | 11,00 | 9,00 | 3 | 70258 | **33,32** |
| **M14** | **2,00** | 110 | 30 | 11,00 | 9,00 | 3 | 70185 | **30,94** |
| MF15 | 1,50 | 100 | 22 | 12,00 | 9,00 | 3 | 70282 | **53,11** |
| MF16 | 1,50 | 100 | 22 | 12,00 | 9,00 | 3 | 70260 | **41,65** |
| **M16** | **2,00** | 110 | 32 | 12,00 | 9,00 | 3 | 70186 | **36,42** |
| MF18 | 1,00 | 110 | 25 | 14,00 | 11,00 | 3 | 70284 | **66,64** |
| MF18 | 1,50 | 110 | 25 | 14,00 | 11,00 | 3 | 70261 | **52,11** |
| MF18 | 2,00 | 125 | 34 | 14,00 | 11,00 | 3 | 70285 | **67,25** |
| **M18** | **2,50** | 125 | 34 | 14,00 | 11,00 | 3 | 75215 | **51,57** |
| MF20 | 1,00 | 125 | 25 | 16,00 | 12,00 | 3 | 70287 | **87,95** |
| MF20 | 1,50 | 125 | 25 | 16,00 | 12,00 | 3 | 70263 | **58,92** |
| MF20 | 2,00 | 140 | 34 | 16,00 | 12,00 | 3 | 70288 | **77,27** |
| **M20** | **2,50** | 140 | 34 | 16,00 | 12,00 | 3 | 70189 | **55,76** |
| MF22 | 1,50 | 125 | 25 | 18,00 | 14,50 | 3 | 75216 | **70,99** |
| MF22 | 2,00 | 140 | 34 | 18,00 | 14,50 | 3 | 70290 | **112,50** |
| **M22** | **2,50** | 140 | 34 | 18,00 | 14,50 | 3 | 70212 | **67,45** |
| MF24 | 1,50 | 140 | 28 | 18,00 | 14,50 | 4 | 70264 | **87,27** |
| MF24 | 2,00 | 140 | 28 | 18,00 | 14,50 | 4 | 70291 | **110,31** |
| **M24** | **3,00** | 160 | 38 | 18,00 | 14,50 | 4 | 70213 | **80,20** |
| MF26 | 1,50 | 140 | 28 | 18,00 | 14,50 | 4 | 70293 | **112,15** |

# Ref. 3200

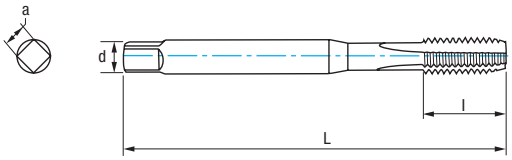
## MACHO RECTO MÁQUINA MÉTRICA/ MÉTRICA FINA
Metric / Metric Fine Machine Straight Tap
Taraud droit machine métrique / métrique pas fin

| M/MF | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| MF27 | 2,00 | 140 | 28 | 20,00 | 16,00 | 4 | 70294 | **152,97** |
| **M27** | **3,00** | 160 | 38 | 20,00 | 16,00 | 4 | 70215 | **100,50** |
| MF28 | 1,50 | 140 | 28 | 20,00 | 16,00 | 4 | 70296 | **128,27** |
| MF30 | 1,50 | 150 | 28 | 22,00 | 18,00 | 4 | 70266 | **133,96** |
| **M30** | **3,50** | 180 | 45 | 22,00 | 18,00 | 4 | 70216 | **129,14** |
| MF32 | 1,50 | 150 | 28 | 22,00 | 18,00 | 4 | 70297 | **160,33** |
| MF33 | 1,50 | 160 | 30 | 25,00 | 20,00 | 4 | 70299 | **183,30** |
| MF33 | 2,00 | 160 | 30 | 25,00 | 20,00 | 4 | 70300 | **264,84** |
| **M33** | **3,50** | 180 | 50 | 25,00 | 20,00 | 4 | 70218 | **162,43** |
| MF35 | 1,50 | 170 | 30 | 28,00 | 22,00 | 4 | 70302 | **212,34** |
| MF36 | **1,50** | 170 | 30 | 28,00 | 22,00 | 4 | 81355 | **235,39** |
| MF36 | 2,00 | 170 | 30 | 28,00 | 22,00 | 4 | 81356 | **235,59** |
| MF36 | 3,00 | 200 | 42 | 28,00 | 22,00 | 4 | 81357 | **270,27** |
| **M36** | **4,00** | 200 | 56 | 28,00 | 22,00 | 4 | 70219 | **198,44** |
| MF39 | 1,50 | 170 | 30 | 32,00 | 24,00 | 4 | 81358 | **266,03** |
| MF39 | 2,00 | 170 | 30 | 32,00 | 24,00 | 4 | 81359 | **236,05** |
| MF39 | 3,00 | 200 | 42 | 32,00 | 24,00 | 4 | 81360 | **227,43** |
| **M39** | **4,00** | 200 | 50 | 32,00 | 24,00 | 4 | 81361 | **222,36** |
| MF42 | 1,50 | 170 | 30 | 32,00 | 24,00 | 4 | 81362 | **249,45** |
| MF42 | 2,00 | 170 | 30 | 32,00 | 24,00 | 4 | 81363 | **244,53** |
| MF42 | 3,00 | 200 | 50 | 32,00 | 24,00 | 4 | 81364 | **378,90** |
| **M42** | **4,50** | 200 | 56 | 32,00 | 24,00 | 4 | 14886 | **285,86** |
| MF45 | 1,50 | 180 | 32 | 36,00 | 29,00 | 6 | 70303 | **372,05** |
| **M45** | **4,50** | 220 | 56 | 36,00 | 29,00 | 6 | 81365 | **361,06** |
| **M48** | **5,00** | 250 | 63 | 36,00 | 29,00 | 6 | 81366 | **518,44** |
| **M52** | **5,00** | 250 | 63 | 40,00 | 32,00 | 6 | 81367 | **583,24** |
| **M56** | **5,50** | 250 | 65 | 40,00 | 32,00 | 6 | 81368 | **638,78** |
| **M60** | **5,50** | 280 | 75 | 45,00 | 35,00 | 6 | 81369 | **678,89** |

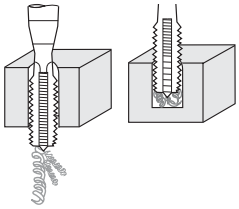


# Ref. 3110

## MACHO RECTO MÁQUINA MÉTRICA MANGO REFORZADO
Reinforced Shank Metric Machine Straight Tap
Taraud droit machine métrique queue renforcée




| HSSE 5%Co | DIN 371 | C 2-3h | Tol. 6H | α 10° ± 2 | 60° |
|---|---|---|---|---|---|



≤ 1,5D

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 15-20 |
| N | N.1 | 5-8 |
| | N.5 | 12-15 |

**Avance f = P (Paso - Pitch - Pas)**
**Vf (mm/min.) = r.p.m. x f**
**r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$**

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **M2** | **0,40** | 45 | 9 | 2,80 | 2,10 | 3 | 62945 | **15,79** |
| **M2,5** | **0,45** | 50 | 9 | 2,80 | 2,10 | 3 | 77131 | **15,79** |
| **M3** | **0,50** | 56 | 11 | 3,50 | 2,70 | 3 | 62948 | **9,43** |
| **M3,5** | **0,60** | 56 | 13 | 4,00 | 3,00 | 3 | 62951 | **14,16** |
| **M4** | **0,70** | 63 | 13 | 4,50 | 3,40 | 3 | 62954 | **9,59** |
| **M4,5** | **0,75** | 70 | 16 | 6,00 | 4,90 | 3 | 77138 | **19,83** |
| **M5** | **0,80** | 70 | 16 | 6,00 | 4,90 | 3 | 62957 | **9,59** |
| **M6** | **1,00** | 80 | 19 | 6,00 | 4,90 | 3 | 62960 | **10,94** |
| **M7** | **1,00** | 80 | 19 | 7,00 | 5,50 | 3 | 62963 | **16,01** |
| **M8** | **1,25** | 90 | 22 | 8,00 | 6,20 | 3 | 62969 | **12,31** |
| **M10** | **1,50** | 100 | 24 | 10,00 | 8,00 | 3 | 62984 | **14,00** |

**Set**
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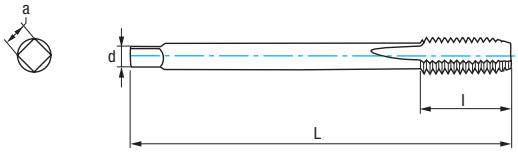
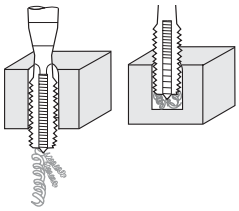
# Ref. 3210

## MACHO RECTO MÁQUINA MÉTRICA / MÉTRICA FINA
Metric / Metric Fine Machine Straight Tap
Taraud droit machine métrique / métrique pas fin




| HSSE 5%Co | M DIN 376 | MF DIN 374 | C 2-3h | Tol. 6H | α 10° ± 2 | 60° |
|---|---|---|---|---|---|---|



≤ 1,5D

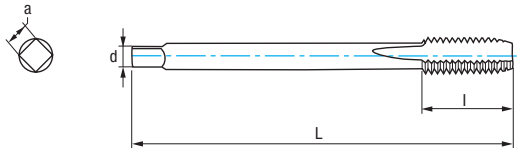
| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 15-20 |
| N | N.1 | 5-8 |
| | N.5 | 12-15 |

**Avance f = P (Paso - Pitch - Pas)**
**Vf (mm/min.) = r.p.m. x f**
**r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$**

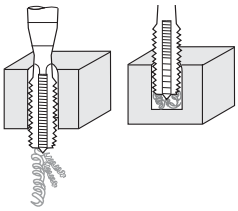
| M/MF | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **M3** | **0,50** | 56 | 11 | 2,20 | | 3 | 69993 | **9,41** |
| MF4 | 0,50 | 63 | 10 | 2,80 | 2,10 | 3 | 70365 | **23,08** |
| **M4** | **0,70** | 63 | 13 | 2,80 | 2,10 | 3 | 69850 | **9,56** |
| MF5 | 0,50 | 70 | 12 | 3,50 | 2,70 | 3 | 70366 | **23,76** |
| **M5** | **0,80** | 70 | 16 | 3,50 | 2,70 | 3 | 69994 | **9,56** |
| MF6 | 0,50 | 80 | 14 | 4,50 | 3,40 | 3 | 74951 | **28,24** |
| MF6 | 0,75 | 80 | 14 | 4,50 | 3,40 | 3 | 70368 | **18,72** |
| **M6** | **1,00** | 80 | 19 | 4,50 | 3,40 | 3 | 69996 | **10,89** |
| **M7** | **1,00** | 80 | 19 | 5,50 | 4,30 | 3 | 70144 | **15,97** |
| MF8 | 0,50 | 80 | 13 | 6,00 | 4,90 | 3 | 70369 | **31,91** |
| MF8 | 0,75 | 80 | 19 | 6,00 | 4,90 | 3 | 70305 | **22,81** |
| MF8 | 1,00 | 90 | 22 | 6,00 | 4,90 | 3 | 70306 | **19,36** |
| **M8** | **1,25** | 90 | 22 | 6,00 | 4,90 | 3 | 69997 | **12,25** |
| MF9 | 1,00 | 90 | 22 | 7,00 | 5,50 | 3 | 70371 | **28,24** |
| MF10 | 0,75 | 90 | 20 | 7,00 | 5,50 | 3 | 70372 | **34,81** |
| MF10 | 1,00 | 90 | 20 | 7,00 | 5,50 | 3 | 70308 | **21,47** |
| MF10 | 1,25 | 100 | 24 | 7,00 | 5,50 | 3 | 70309 | **24,57** |
| **M10** | **1,50** | 100 | 24 | 7,00 | 5,50 | 3 | 69999 | **13,95** |
| MF11 | 1,00 | 90 | 20 | 8,00 | 6,20 | 3 | 70374 | **35,68** |
| MF12 | 1,00 | 100 | 22 | 9,00 | 7,00 | 3 | 70312 | **28,34** |
| MF12 | 1,25 | 100 | 22 | 9,00 | 7,00 | 3 | 70314 | **28,69** |
| MF12 | 1,50 | 100 | 22 | 9,00 | 7,00 | 3 | 70315 | **25,68** |
| **M12** | **1,75** | 110 | 29 | 9,00 | 7,00 | 3 | 70117 | **16,63** |
| MF14 | 1,00 | 100 | 22 | 11,00 | 9,00 | 3 | 70317 | **43,50** |
| MF14 | 1,25 | 100 | 22 | 11,00 | 9,00 | 3 | 70318 | **38,45** |
| MF14 | 1,50 | 100 | 22 | 11,00 | 9,00 | 3 | 70320 | **30,27** |
| **M14** | **2,00** | 110 | 30 | 11,00 | 9,00 | 3 | 70119 | **28,15** |
| MF15 | 1,00 | 100 | 22 | 12,00 | 9,00 | 3 | 70378 | **54,33** |
| MF16 | 1,00 | 100 | 22 | 12,00 | 9,00 | 3 | 70380 | **54,10** |
| MF16 | 1,50 | 100 | 22 | 12,00 | 9,00 | 3 | 70323 | **37,87** |
| **M16** | **2,00** | 110 | 32 | 12,00 | 9,00 | 3 | 70120 | **33,10** |
| MF18 | 1,00 | 110 | 25 | 14,00 | 11,00 | 3 | 70326 | **60,58** |
| MF18 | 1,50 | 110 | 25 | 14,00 | 11,00 | 3 | 70327 | **47,38** |
| MF18 | 2,00 | 125 | 34 | 14,00 | 11,00 | 3 | 70329 | **61,13** |
| **M18** | **2,50** | 125 | 34 | 14,00 | 11,00 | 3 | 70122 | **47,60** |

# Ref. 3210

## MACHO RECTO MÁQUINA MÉTRICA / MÉTRICA FINA
Metric / Metric Fine Machine Straight Tap
Taraud droit machine métrique / métrique pas fin




| HSSE 5%Co | M DIN 376 | MF DIN 374 | C 2-3h | Tol. 6H | α 10° ± 2 | 60° |
|---|---|---|---|---|---|---|



≤ 1,5D

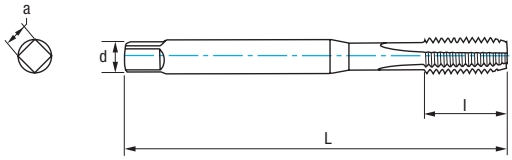
| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 15-20 |
| N | N.1 | 5-8 |
| | N.5 | 12-15 |

**Avance f = P (Paso - Pitch - Pas)**
**Vf (mm/min.) = r.p.m. x f**
**r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$**

| M/MF | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| MF20 | **1,00** | 125 | 25 | 16,00 | 12,00 | 3 | 70330 | **80,03** |
| MF20 | 1,50 | 125 | 25 | 16,00 | 12,00 | 3 | 70332 | **53,62** |
| MF20 | 2,00 | 140 | 34 | 16,00 | 12,00 | 3 | 70333 | **70,24** |
| **M20** | **2,50** | 140 | 34 | 16,00 | 12,00 | 3 | 70123 | **50,69** |
| MF22 | 1,00 | 125 | 25 | 18,00 | 14,50 | 3 | 70381 | **89,70** |
| MF22 | 1,50 | 125 | 25 | 18,00 | 14,50 | 3 | 75023 | **64,55** |
| MF22 | 2,00 | 140 | 34 | 18,00 | 14,50 | 3 | 70335 | **89,70** |
| **M22** | **2,50** | 140 | 34 | 18,00 | 14,50 | 3 | 70146 | **61,35** |
| MF24 | 1,00 | 140 | 28 | 18,00 | 14,50 | 4 | 70383 | **97,77** |
| MF24 | 1,50 | 140 | 28 | 18,00 | 14,50 | 4 | 70336 | **79,31** |
| MF24 | 2,00 | 140 | 28 | 18,00 | 14,50 | 4 | 70338 | **100,25** |
| **M24** | **3,00** | 160 | 38 | 18,00 | 14,50 | 4 | 70147 | **73,46** |
| MF25 | 1,50 | 140 | 28 | 18,00 | 14,50 | 4 | 70384 | **116,85** |
| MF26 | 1,50 | 140 | 28 | 18,00 | 14,50 | 4 | 70339 | **106,98** |
| MF27 | 1,50 | 140 | 28 | 20,00 | 16,00 | 4 | 70386 | **117,03** |
| MF27 | 2,00 | 140 | 28 | 20,00 | 16,00 | 4 | 70341 | **139,05** |
| **M27** | **3,00** | 160 | 38 | 20,00 | 16,00 | 4 | 70149 | **91,70** |
| MF28 | 1,50 | 140 | 28 | 20,00 | 16,00 | 4 | 70342 | **116,85** |
| MF30 | 1,00 | 150 | 28 | 22,00 | 18,00 | 4 | 70387 | **149,46** |
| MF30 | 1,50 | 150 | 28 | 22,00 | 18,00 | 4 | 70344 | **121,79** |
| MF30 | 2,00 | 150 | 28 | 22,00 | 18,00 | 4 | 70389 | **150,75** |
| **M30** | **3,50** | 180 | 45 | 22,00 | 18,00 | 4 | 70150 | **117,42** |
| MF32 | 1,50 | 150 | 28 | 22,00 | 18,00 | 4 | 70345 | **145,83** |
| MF33 | 1,50 | 160 | 30 | 25,00 | 20,00 | 4 | 70347 | **167,19** |
| MF33 | 2,00 | 160 | 30 | 25,00 | 20,00 | 4 | 70348 | **284,55** |
| **M33** | **3,50** | 180 | 50 | 25,00 | 20,00 | 4 | 70152 | **141,14** |
| MF35 | 1,50 | 170 | 30 | 28,00 | 22,00 | 4 | 70350 | **192,98** |
| **M36** | **4,00** | 200 | 56 | 28,00 | 22,00 | 4 | 70153 | **180,46** |
| MF42 | 1,50 | 170 | 30 | 32,00 | 24,00 | 6 | 70390 | **273,13** |
| MF45 | 1,50 | 180 | 32 | 36,00 | 29,00 | 6 | 70351 | **338,24** |
| MF48 | 2,00 | 190 | 32 | 36,00 | 29,00 | 6 | 75037 | **520,24** |
| MF50 | 1,50 | 190 | 32 | 36,00 | 29,00 | 6 | 70393 | **404,11** |

# Ref. 3600

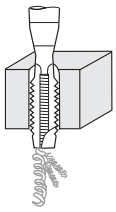
## MACHO RECTO MÁQUINA MÉTRICA MANGO REFORZADO FORMA A
A Form Reinforced Shank Metric Machine Straight Tap
Taraud droit machine métrique queue renforcée form A




HSSE 5%Co | DIN 371 | A 6-8h | Tol. 6H | α 10° ± 2 | 60°

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 10-14 |

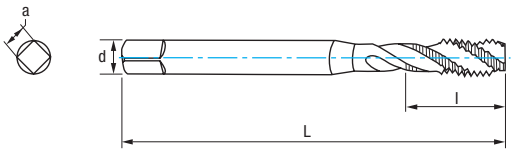
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$


≤ 2D

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **M3** | **0,50** | 56 | 11 | 3,50 | 2,70 | 3 | 76567 | **11,30** |
| **M4** | **0,70** | 63 | 13 | 4,50 | 3,40 | 3 | 76573 | **11,52** |
| **M5** | **0,80** | 70 | 16 | 6,00 | 4,90 | 3 | 76580 | **11,52** |
| **M6** | **1,00** | 80 | 19 | 6,00 | 4,90 | 3 | 76586 | **12,66** |
| **M8** | **1,25** | 90 | 22 | 8,00 | 6,20 | 3 | 76594 | **14,16** |
| **M10** | **1,50** | 100 | 24 | 10,00 | 8,00 | 3 | 76602 | **17,41** |

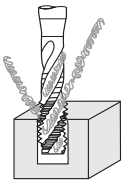
# Ref. 3150

## MACHO HELICOIDAL MÁQUINA MÉTRICA MANGO REFORZADO
Reinforced Shank Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique queue renforcée




| HSSE 5%Co | DIN 371 | C 2-3h | 35° | Tol. 6H | α 10° ± 2 | 60° |
|---|---|---|---|---|---|---|

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |


< 2D

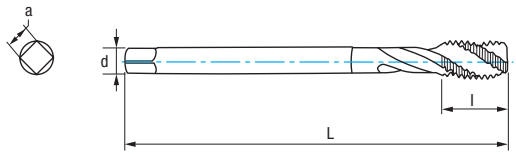
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **M3** | **0,50** | 56 | 5 | 3,50 | 2,70 | 3 | 63050 | **12,57** |
| **M3,5** | **0,60** | 56 | 6 | 4,00 | 3,00 | 3 | 63053 | **18,48** |
| **M4** | **0,70** | 63 | 7 | 4,50 | 3,40 | 3 | 63056 | **12,57** |
| **M5** | **0,80** | 70 | 8 | 6,00 | 4,90 | 3 | 63059 | **11,99** |
| **M6** | **1,00** | 80 | 10 | 6,00 | 4,90 | 3 | 63062 | **13,16** |
| **M7** | **1,00** | 80 | 10 | 7,00 | 5,50 | 3 | 63065 | **20,52** |
| **M8** | **1,25** | 90 | 13 | 8,00 | 6,20 | 3 | 63071 | **15,05** |
| **M9** | **1,25** | 90 | 13 | 9,00 | 7,00 | 3 | 67882 | **25,65** |
| **M10** | **1,50** | 100 | 15 | 10,00 | 8,00 | 3 | 63083 | **17,84** |

**Set**
pag. 257

# Ref. 3250

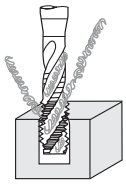
## MACHO HELICOIDAL MÁQUINA MÉTRICA / MÉTRICA FINA
Metric / Metric Fine Machine Spiral Tap
Taraud hélicoïdal machine métrique / métrique pas fin




| HSSE 5%Co | M DIN 376 | MF DIN 374 | C 2-3h | 35° | Tol. 6H | α 10° ± 2 | 60° |
|---|---|---|---|---|---|---|---|

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

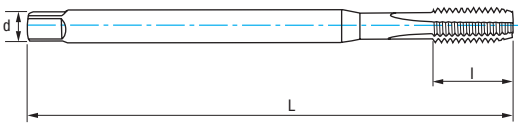


< 2D

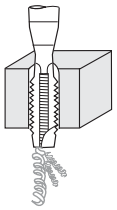
| M/MF | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **M3** | **0,50** | 56 | 5 | 2,20 | | 3 | 70063 | **12,25** |
| **M4** | **0,70** | 63 | 7 | 2,80 | 2,10 | 3 | 70065 | **12,15** |
| **M5** | **0,80** | 70 | 8 | 3,50 | 2,70 | 3 | 70066 | **11,64** |
| **M6** | **1,00** | 80 | 10 | 4,50 | 3,40 | 3 | 70068 | **12,75** |
| MF8 | 1,00 | 90 | 13 | 6,00 | 4,90 | 3 | 70228 | **25,21** |
| **M8** | **1,25** | 90 | 13 | 6,00 | 4,90 | 3 | 70069 | **14,96** |
| MF10 | 1,00 | 90 | 12 | 7,00 | 5,50 | 3 | 70230 | **29,72** |
| MF10 | 1,25 | 100 | 15 | 7,00 | 5,50 | 3 | 70231 | **32,35** |
| **M10** | **1,50** | 100 | 15 | 7,00 | 5,50 | 3 | 70071 | **17,78** |
| MF12 | 1,00 | 100 | 14 | 9,00 | 7,00 | 3 | 70233 | **36,92** |
| MF12 | 1,25 | 100 | 14 | 9,00 | 7,00 | 3 | 70234 | **35,33** |
| MF12 | 1,50 | 100 | 14 | 9,00 | 7,00 | 3 | 70236 | **33,99** |
| **M12** | **1,75** | 110 | 18 | 9,00 | 7,00 | 3 | 70161 | **22,87** |
| MF14 | 1,25 | 100 | 16 | 11,00 | 9,00 | 3 | 70237 | **52,19** |
| MF14 | 1,50 | 100 | 16 | 11,00 | 9,00 | 3 | 70239 | **41,79** |
| **M14** | **2,00** | 110 | 20 | 11,00 | 9,00 | 3 | 70162 | **35,89** |
| MF16 | 1,50 | 100 | 16 | 12,00 | 9,00 | 3 | 70240 | **51,37** |
| **M16** | **2,00** | 110 | 20 | 12,00 | 9,00 | 4 | 70164 | **43,35** |
| MF18 | 1,50 | 110 | 20 | 14,00 | 11,00 | 4 | 70242 | **62,05** |
| **M18** | **2,50** | 125 | 25 | 14,00 | 11,00 | 4 | 75057 | **58,38** |
| MF20 | 1,50 | 125 | 20 | 16,00 | 12,00 | 4 | 70243 | **70,86** |
| **M20** | **2,50** | 140 | 25 | 16,00 | 12,00 | 4 | 70167 | **62,15** |
| MF22 | 1,50 | 125 | 20 | 18,00 | 14,50 | 4 | 75192 | **92,75** |
| **M22** | **2,50** | 140 | 25 | 18,00 | 14,50 | 4 | 70206 | **76,67** |
| MF24 | 1,50 | 140 | 22 | 18,00 | 14,50 | 4 | 70245 | **103,89** |
| MF24 | 2,00 | 140 | 28 | 18,00 | 14,50 | 4 | 24326 | **109,05** |
| **M24** | **3,00** | 160 | 30 | 18,00 | 14,50 | 4 | 70207 | **91,77** |
| New! MF27 | 2,00 | 140 | 28 | 20,00 | 16,00 | 4 | 71566 | **171,98** |
| **M27** | **3,00** | 160 | 30 | 20,00 | 16,00 | 4 | 70209 | **114,65** |
| MF30 | 1,50 | 150 | 28 | 22,00 | 18,00 | 4 | 70246 | **159,74** |
| **M30** | **3,50** | 180 | 35 | 22,00 | 18,00 | 4 | 70210 | **146,85** |

# Ref. 3166

## MACHO RECTO LARGO MÁQUINA MÉTRICA
Metric Machine Long Straight Tap
Taraud droit long machine métrique




HSSE 5%Co | DIN 371 | DIN 376 | B 3,5-5h | GUN | Tol. 6H | α 10 -12° | 60°

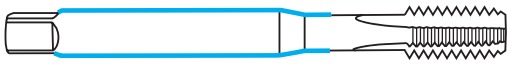


≤ 2D

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

DIN 371



| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M3 | 0,50 | 100 | 11 | 3,50 | 2,70 | 3 | 69381 | 29,67 |
| M4 | 0,70 | 100 | 13 | 4,50 | 3,40 | 3 | 69382 | 30,33 |
| M5 | 0,80 | 120 | 16 | 6,00 | 4,90 | 3 | 69383 | 30,33 |
| M6 | 1,00 | 120 | 19 | 6,00 | 4,90 | 3 | 69384 | 33,33 |
| M8 | 1,25 | 150 | 22 | 8,00 | 6,20 | 3 | 69385 | 39,06 |
| M10 | 1,50 | 150 | 24 | 10,00 | 8,00 | 3 | 69387 | 48,10 |
| M12 | 1,75 | 150 | 29 | 12,00 | 9,00 | 3 | 69388 | 59,18 |

**New!**

DIN 376

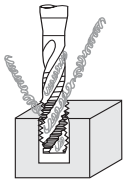
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M6 | 1,00 | 160 | 19 | 4,50 | 3,40 | 3 | 84093 | 35,50 |
| M7 | 1,00 | 160 | 19 | 5,50 | 4,30 | 3 | 84094 | 38,83 |
| M8 | 1,25 | 180 | 22 | 5,20 | 5,00 | 3 | 84095 | 41,65 |
| M10 | 1,50 | 200 | 24 | 7,00 | 5,50 | 3 | 84096 | 49,35 |
| M12 | 1,75 | 220 | 29 | 8,50 | 6,50 | 3 | 84097 | 60,73 |
| M14 | 2,00 | 220 | 30 | 10,50 | 8,00 | 3 | 84098 | 94,24 |
| M16 | 2,00 | 220 | 32 | 12,50 | 10,00 | 3 | 84099 | 110,86 |
| M18 | 2,50 | 250 | 34 | 14,00 | 11,00 | 3 | 84100 | 201,71 |
| M20 | 2,50 | 250 | 34 | 16,00 | 12,00 | 3 | 84101 | 218,01 |

# Ref. 3167

## MACHO HELICOIDAL LARGO MÁQUINA MÉTRICA
Metric Machine Long Spiral Tap
Taraud hélicoïdal long machine métrique

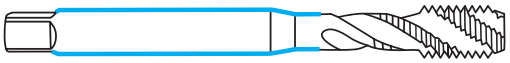
HSSE 5%Co | DIN 371 | DIN 376 | C 2-3h | 35° | Tol. 6H | α 10° ± 2 | 60°

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |


< 2D

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

DIN 371



| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M3 | 0,50 | 100 | 5 | 3,50 | 2,70 | 3 | 69389 | 36,72 |
| M4 | 0,70 | 100 | 7 | 4,50 | 3,40 | 3 | 69392 | 36,72 |
| M5 | 0,80 | 120 | 8 | 6,00 | 4,90 | 3 | 69395 | 35,17 |
| M6 | 1,00 | 120 | 10 | 6,00 | 4,90 | 3 | 69398 | 38,58 |
| M8 | 1,25 | 150 | 13 | 8,00 | 6,20 | 3 | 69401 | 46,88 |
| M10 | 1,50 | 150 | 15 | 10,00 | 8,00 | 3 | 69404 | 54,34 |
| M12 | 1,75 | 150 | 18 | 12,00 | 9,00 | 3 | 69407 | 70,28 |

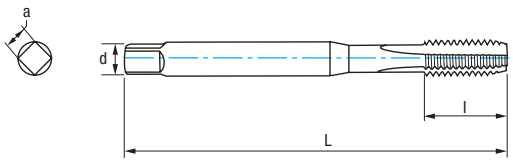
**New!**

DIN 376

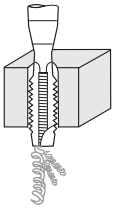
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M6 | 1,00 | 160 | 10 | 4,50 | 3,40 | 3 | 84102 | 41,14 |
| M7 | 1,00 | 160 | 10 | 5,50 | 4,30 | 3 | 84103 | 44,95 |
| M8 | 1,25 | 180 | 13 | 5,20 | 5,00 | 3 | 84104 | 48,99 |
| M10 | 1,50 | 200 | 15 | 7,00 | 5,50 | 3 | 84105 | 55,76 |
| M12 | 1,75 | 220 | 18 | 8,50 | 6,50 | 3 | 84106 | 72,12 |
| M14 | 2,00 | 220 | 20 | 10,50 | 8,00 | 3 | 84107 | 105,60 |
| M16 | 2,00 | 220 | 20 | 12,50 | 10,00 | 3 | 84108 | 153,03 |
| M18 | 2,50 | 250 | 25 | 14,00 | 11,00 | 3 | 84109 | 228,40 |
| M20 | 2,50 | 250 | 25 | 16,00 | 12,00 | 3 | 84110 | 243,08 |

# Ref. 3101

## MACHO RECTO MÁQUINA MÉTRICA CORTE IZQUIERDA MANGO REFORZADO
Reinforced Shank Left Cutting Metric Machine Straight Tap
Taraud droit machine métrique coupe à gauche queue renforcée




| HSSE 5%Co | DIN 371 | B 3,5-5h | GUN | Tol. 6H | α 10 - 12° | L | 60° |
|---|---|---|---|---|---|---|---|



≤ 2D

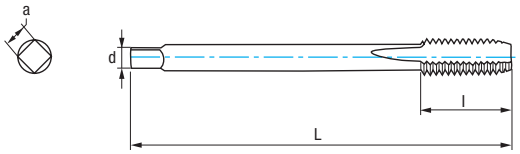
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M2 | 0,40 | 45 | 9 | 2,80 | 2,10 | 3 | 59469 | 33,61 |
| M3 | 0,50 | 56 | 11 | 3,50 | 2,70 | 3 | 59470 | 19,10 |
| M4 | 0,70 | 63 | 13 | 4,50 | 3,40 | 3 | 59471 | 20,13 |
| M5 | 0,80 | 70 | 16 | 6,00 | 4,90 | 3 | 59472 | 20,13 |
| M6 | 1,00 | 80 | 19 | 6,00 | 4,90 | 3 | 59473 | 22,13 |
| M7 | 1,00 | 80 | 19 | 7,00 | 5,50 | 3 | 59474 | 35,01 |
| M8 | 1,25 | 90 | 22 | 8,00 | 6,20 | 3 | 59475 | 24,77 |
| M10 | 1,50 | 100 | 24 | 10,00 | 8,00 | 3 | 59476 | 30,47 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

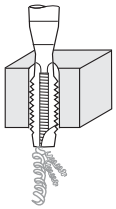
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

# Ref. 3201

## MACHO RECTO MÁQUINA MÉTRICA CORTE IZQUIERDA
Left Cutting Metric Machine Straight Tap
Taraud droit machine métrique coupe à gauche




| HSSE 5%Co | DIN 376 | B 3,5-5h | GUN | Tol. 6H | α 10 -12° | L | 60° |
|---|---|---|---|---|---|---|---|



≤ 2D

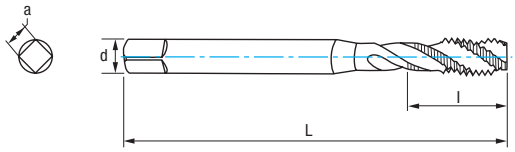
| | M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|---|
| | M3 | 0,50 | 56 | 11 | 2,20 | | | 59840 | 20,37 |
| | M4 | 0,70 | 63 | 13 | 2,80 | 2,10 | 3 | 20077 | 20,59 |
| | M5 | 0,80 | 70 | 16 | 3,50 | 2,70 | 3 | 20078 | 20,59 |
| | M6 | 1,00 | 80 | 19 | 4,50 | 3,40 | 3 | 20079 | 22,67 |
| | M7 | 1,00 | 80 | 19 | 5,50 | 4,30 | 3 | 59843 | 35,97 |
| | M8 | 1,25 | 90 | 22 | 6,00 | 4,90 | 3 | 10767 | 25,45 |
| | M10 | 1,50 | 100 | 24 | 7,00 | 5,50 | 3 | 59844 | 31,31 |
| | M11 | 1,50 | 100 | 24 | 8,00 | 6,20 | 3 | 59845 | 60,40 |
| | M12 | 1,75 | 110 | 29 | 9,00 | 7,00 | 3 | 29501 | 38,56 |
| | M14 | 2,00 | 110 | 30 | 11,00 | 9,00 | 3 | 59846 | 61,89 |
| | M16 | 2,00 | 110 | 32 | 12,00 | 9,00 | 3 | 59847 | 72,82 |
| New! | M18 | 2,50 | 125 | 34 | 14,00 | 11,00 | 3 | 62931 | 103,11 |
| New! | M20 | 2,50 | 140 | 34 | 16,00 | 12,00 | 3 | 39047 | 111,50 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

# Ref. 3161

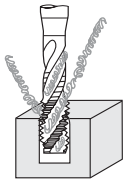
## MACHO HELICOIDAL MÁQUINA MÉTRICA CORTE IZQUIERDA M. REFORZADO
Reinforced Shank Left Cutting Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique coupe à gauche queue renforcée




HSSE 5%Co | DIN 371 | C 2-3h | 35° | Tol. 6H | α 10° ± 2 | L | 60°

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

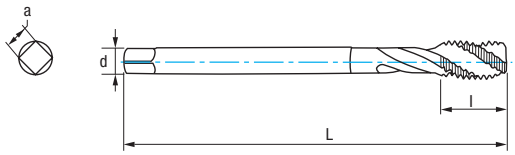


< 2D

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M3 | 0,50 | 56 | 5 | 3,50 | 2,70 | 3 | 59477 | 25,11 |
| M4 | 0,70 | 63 | 7 | 4,50 | 3,40 | 3 | 59478 | 25,11 |
| M5 | 0,80 | 70 | 8 | 6,00 | 4,90 | 3 | 59479 | 23,98 |
| M6 | 1,00 | 80 | 10 | 6,00 | 4,90 | 3 | 59480 | 26,36 |
| M7 | 1,00 | 80 | 10 | 7,00 | 5,50 | 3 | 59481 | 41,01 |
| M8 | 1,25 | 90 | 13 | 8,00 | 6,20 | 3 | 59482 | 30,09 |
| M10 | 1,50 | 100 | 15 | 10,00 | 8,00 | 3 | 59483 | 35,70 |

# Ref. 3261

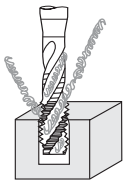
## MACHO HELICOIDAL MÁQUINA MÉTRICA CORTE IZQUIERDA
Left Cutting Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique coupe à gauche




HSSE 5%Co | DIN 376 | C 2-3h | 35° | Tol. 6H | α 10° ± 2 | L | 60°

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

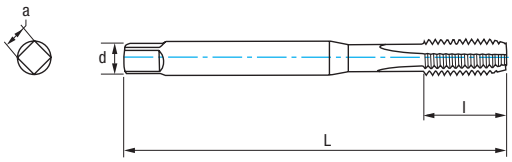


< 2D

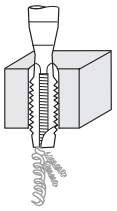
| | M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|---|
| | M3 | 0,50 | 56 | 5 | 2,20 | | | 59848 | 24,50 |
| | M4 | 0,70 | 63 | 7 | 2,80 | 2,10 | 3 | 59849 | 24,30 |
| | M5 | 0,80 | 70 | 8 | 3,50 | 2,70 | 3 | 59850 | 23,26 |
| | M6 | 1,00 | 80 | 10 | 4,50 | 3,40 | 3 | 59851 | 25,51 |
| | M8 | 1,25 | 90 | 13 | 6,00 | 4,90 | 3 | 59852 | 29,91 |
| | M10 | 1,50 | 100 | 15 | 7,00 | 5,50 | 3 | 59853 | 35,55 |
| | M12 | 1,75 | 110 | 18 | 9,00 | 7,00 | 3 | 59854 | 45,72 |
| | M14 | 2,00 | 110 | 20 | 11,00 | 9,00 | 3 | 59855 | 71,80 |
| | M16 | 2,00 | 110 | 20 | 12,00 | 9,00 | 3 | 59856 | 86,75 |
| New! | M18 | 2,50 | 125 | 25 | 14,00 | 11,00 | 4 | 62956 | 116,81 |
| New! | M20 | 2,50 | 140 | 25 | 16,00 | 12,00 | 4 | 62959 | 124,35 |

# Ref. 3105

## MACHO RECTO MÁQUINA MÉTRICA MANGO REFORZADO 6G
6G Reinforced Shank Metric Machine Straight Tap
Taraud droit machine métrique queue renforcée 6G




HSSE 5%Co | DIN 371 | B 3,5-5h | GUN | Tol. 6G | α 10 - 12° | 60°



≤ 2D

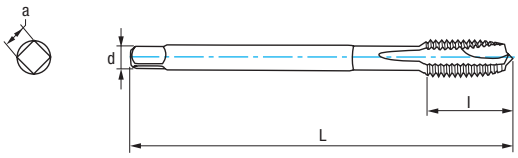
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M3 | 0,50 | 56 | 11 | 3,50 | 2,70 | 3 | 38319 | 13,34 |
| M4 | 0,70 | 63 | 13 | 4,50 | 3,40 | 3 | 38320 | 13,34 |
| M5 | 0,80 | 70 | 16 | 6,00 | 4,90 | 3 | 38321 | 13,34 |
| M6 | 1,00 | 80 | 19 | 6,00 | 4,90 | 3 | 38322 | 13,47 |
| M8 | 1,25 | 90 | 22 | 8,00 | 6,20 | 3 | 38323 | 16,15 |
| M10 | 1,50 | 100 | 24 | 10,00 | 8,00 | 3 | 38324 | 18,97 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

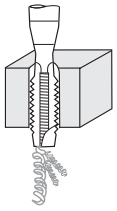
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

# Ref. 3205

## MACHO RECTO MÁQUINA MÉTRICA TOLERANCIA 6G
6G Tolerance Metric Machine Straight Tap
Taraud droit machine métrique tolérance 6G




HSSE 5%Co | DIN 376 | B 3,5-5h | GUN | Tol. 6G | α 10 - 12° | 60°



< 2D

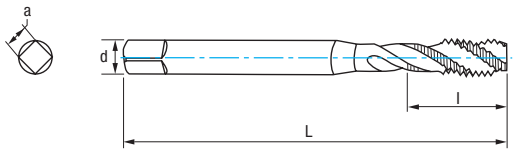
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M12 | 1,75 | 110 | 29 | 9,00 | 7,00 | 3 | 38325 | 23,73 |
| M14 | 2,00 | 110 | 30 | 11,00 | 9,00 | 3 | 38326 | 29,76 |
| M16 | 2,00 | 110 | 32 | 12,00 | 9,00 | 3 | 38327 | 36,00 |
| M18 | 2,50 | 125 | 34 | 14,00 | 11,00 | 3 | 38328 | 49,43 |
| M20 | 2,50 | 140 | 34 | 16,00 | 12,00 | 3 | 38329 | 51,68 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

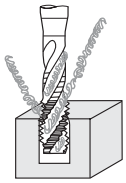
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

# Ref. 3155

## MACHO HELICOIDAL MÁQUINA MÉTRICA MANGO REFORZADO TOLERANCIA 6G
6G Tolerance Reinforced Shank Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique queue renforcée tolérance 6G




HSSE 5%Co | DIN 371 | C 2-3h | Tol. 6G | 35° | α 10° ± 2 | 60°



< 2D

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

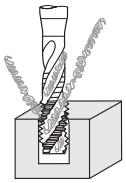
Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M3 | 0,50 | 56 | 5 | 3,50 | 2,70 | 3 | 38330 | 14,71 |
| M4 | 0,70 | 63 | 7 | 4,50 | 3,40 | 3 | 38331 | 14,71 |
| M5 | 0,80 | 70 | 8 | 6,00 | 4,90 | 3 | 38332 | 14,19 |
| M6 | 1,00 | 80 | 10 | 6,00 | 4,90 | 3 | 38333 | 15,54 |
| M8 | 1,25 | 90 | 13 | 8,00 | 6,20 | 3 | 38334 | 18,55 |
| M10 | 1,50 | 100 | 15 | 10,00 | 8,00 | 3 | 38335 | 22,03 |

# Ref. 3255

## MACHO HELICOIDAL MÁQUINA MÉTRICA TOLERANCIA 6G
6G Tolerance Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique tolérance 6G

HSSE 5%Co | DIN 376 | C 2-3h | Tol. 6G | 35° | α 10° ± 2 | 60°



< 2D

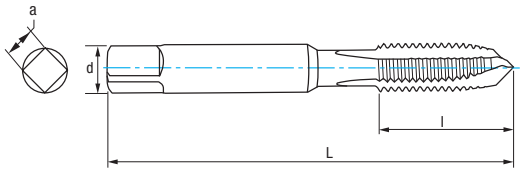
| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

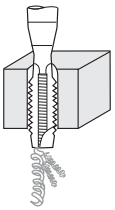
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| M12 | 1,75 | 110 | 18 | 9,00 | 7,00 | 3 | 38336 | 29,38 |
| M14 | 2,00 | 110 | 20 | 11,00 | 9,00 | 3 | 38337 | 33,93 |
| M16 | 2,00 | 110 | 20 | 12,00 | 9,00 | 4 | 38338 | 40,97 |
| M18 | 2,50 | 125 | 25 | 14,00 | 11,00 | 4 | 38339 | 55,81 |
| M20 | 2,50 | 140 | 25 | 16,00 | 12,00 | 4 | 38340 | 58,73 |

# Ref. 3119

## MACHO RECTO MÁQUINA MÉTRICA NORMA ISO 529
ISO 529 Norm Standard Metric Machine Straight Tap
Taraud droit machine métrique norme ISO 529




HSSE 5%Co | ISO 529 | B 3,5-5h | Tol. 6H | GUN | α 10-12° | 60° | **Vaporizado** Vaporized Vaporisée



≤ 2D

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| M | | 8-12 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

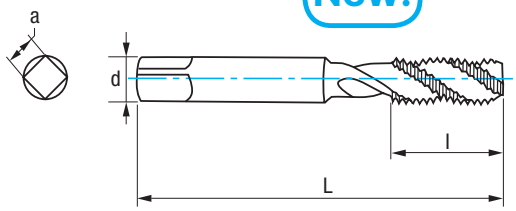
**Avance f = P** (Paso - Pitch - Pas)
**Vf (mm/min.) = r.p.m. x f**
**r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$**

| | M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|---|
| New! | **M2** | **0,40** | 41 | 8 | 2,50 | 2,00 | 2 | 77478 | **15,03** |
| New! | **M2,5** | **0,45** | 44 | 9,5 | 2,80 | 2,24 | 2 | 77479 | **15,03** |
| | **M3** | **0,50** | 48 | 11 | 3,15 | 2,50 | 3 | 69558 | **8,51** |
| New! | **M3,5** | **0,60** | 53 | 13 | 4,00 | 3,15 | 3 | 69562 | **13,48** |
| | **M4** | **0,70** | 53 | 13 | 4,00 | 3,15 | 3 | 69567 | **8,51** |
| New! | **M4,5** | **0,75** | 58 | 16 | 5,00 | 4,00 | 3 | 69570 | **13,48** |
| | **M5** | **0,80** | 58 | 16 | 5,00 | 4,00 | 3 | 69575 | **8,51** |
| | **M6** | **1,00** | 66 | 19 | 6,30 | 5,00 | 3 | 69582 | **8,51** |
| New! | **M7** | **1,00** | 66 | 19 | 6,30 | 5,00 | 3 | 69583 | **16,05** |
| | **M8** | **1,25** | 72 | 22 | 8,00 | 6,30 | 3 | 69586 | **12,50** |
| | **M10** | **1,50** | 80 | 24 | 10,00 | 8,00 | 3 | 69588 | **15,01** |
| | **M12** | **1,75** | 89 | 29 | 9,00 | 7,10 | 3 | 69607 | **19,27** |
| | **M14** | **2,00** | 95 | 30 | 11,20 | 9,00 | 3 | 69608 | **25,02** |
| | **M16** | **2,00** | 102 | 32 | 12,50 | 10,00 | 3 | 69610 | **34,98** |
| | **M18** | **2,50** | 112 | 37 | 14,00 | 11,20 | 3 | 69611 | **45,87** |
| | **M20** | **2,50** | 112 | 37 | 14,00 | 11,20 | 3 | 69613 | **61,75** |
| | **M22** | **2,50** | 118 | 38 | 16,00 | 12,50 | 3 | 69614 | **74,77** |
| | **M24** | **3,00** | 130 | 45 | 18,00 | 14,00 | 3 | 69616 | **98,56** |
| | **M27** | **3,00** | 135 | 45 | 20,00 | 16,00 | 3 | 69617 | **121,40** |
| | **M30** | **3,50** | 138 | 48 | 20,00 | 16,00 | 3 | 69619 | **156,44** |

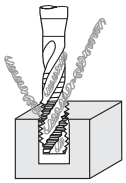
# Ref. 3113

## MACHO HELICOIDAL MÁQUINA MÉTRICA NORMA ISO 529
ISO 529 Standard Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique norme ISO 529

New!




HSSE 5%Co | ISO 529 | C 2-3h | Tol. 6H | 45° | α 12-14° | 60° | **Vaporizado** Vaporized Vaporisée



< 2D

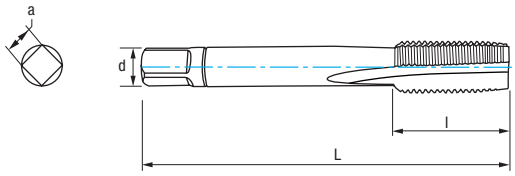
| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5% Co |
| P | P.1 | 6-10 |
| M | | 8-12 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

**Avance f =** **P** (Paso - Pitch - Pas)
**Vf (mm/min.) =** **r.p.m. x f**
**r.p.m. =** $\frac{Vc \times 1.000}{\pi \times \varnothing}$

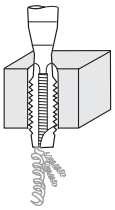
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **M2** | **0,40** | 41 | 8 | 2,50 | 2,00 | 2 | 48989 | **17,64** |
| **M2,5** | **0,45** | 44 | 9,5 | 2,80 | 2,24 | 2 | 48992 | **17,64** |
| **M3** | **0,50** | 48 | 6 | 3,15 | 2,50 | 3 | 49004 | **10,01** |
| **M3,5** | **0,60** | 50 | 6 | 3,55 | 2,80 | 3 | 49016 | **15,86** |
| **M4** | **0,70** | 53 | 7 | 4,00 | 3,15 | 3 | 49019 | **10,01** |
| **M5** | **0,80** | 58 | 8 | 5,00 | 4,00 | 3 | 49022 | **10,01** |
| **M6** | **1,00** | 66 | 10 | 6,30 | 5,00 | 3 | 49025 | **10,01** |
| **M7** | **1,00** | 66 | 13 | 7,10 | 5,60 | 3 | 49028 | **18,89** |
| **M8** | **1,25** | 72 | 12 | 8,00 | 6,30 | 3 | 49031 | **13,36** |
| **M10** | **1,50** | 80 | 15 | 10,00 | 8,00 | 3 | 49034 | **17,00** |
| **M12** | **1,75** | 89 | 16 | 9,00 | 7,10 | 3 | 49187 | **21,87** |
| **M14** | **2,00** | 95 | 18 | 11,20 | 9,00 | 3 | 49190 | **27,82** |
| **M16** | **2,00** | 102 | 18 | 12,50 | 10,00 | 4 | 49193 | **38,86** |
| **M18** | **2,50** | 112 | 29 | 14,00 | 11,20 | 4 | 49196 | **51,01** |
| **M20** | **2,50** | 112 | 29 | 14,00 | 11,20 | 4 | 49199 | **68,61** |
| **M22** | **2,50** | 118 | 29 | 16,00 | 12,50 | 4 | 49202 | **83,09** |
| **M24** | **3,00** | 130 | 35 | 18,00 | 14,00 | 4 | 49205 | **109,51** |
| **M27** | **3,00** | 135 | 35 | 20,00 | 16,00 | 4 | 77480 | **137,23** |
| **M30** | **3,50** | 138 | 42 | 20,00 | 16,00 | 4 | 77481 | **176,17** |

# Ref. 3109

## MACHO RECTO MÁQUINA MÉTRICA NORMA ISO 529
ISO 529 Norm Standard Metric Machine Straight Tap
Taraud droit machine métrique norme ISO 529




HSS | HSS + TIN | ISO 529 | B 3,5-5h | Tol. 6H | GUN | α 10-12° | 60°

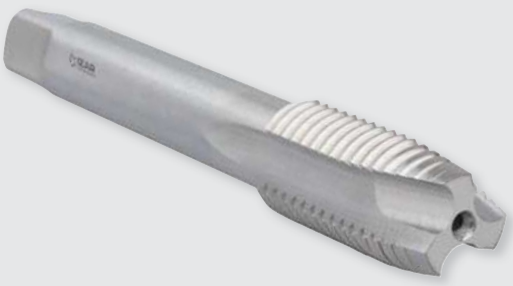


≤ 2D

| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | HSS | TIN |
| P | P.1 | 6-10 | 9-13 |
| N | N.1 | 5-8 | 8-12 |
| | N.3 | 15-35 | 20-45 |
| | N.4 | 14-20 | 18-30 |

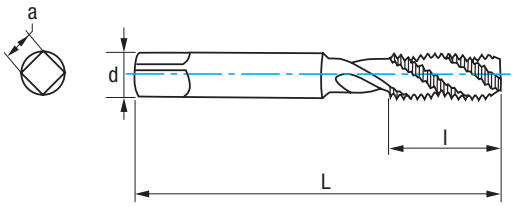
Avance **f** = **P** (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$

| | M | P | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € | New! N° Art. TIN | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | M3 | 0,50 | 48 | 11 | 3,15 | 2,50 | 3 | 38180 | 7,40 | 31717 | 10,23 |
| | M3,5 | 0,60 | 53 | 13 | 4,00 | 3,15 | 3 | 38181 | 11,71 | 70208 | 14,88 |
| | M4 | 0,70 | 53 | 13 | 4,00 | 3,15 | 3 | 38182 | 7,40 | 31718 | 10,46 |
| | M4,5 | 0,75 | 58 | 16 | 5,00 | 4,00 | 3 | 38183 | 11,71 | 70229 | 14,88 |
| | M5 | 0,80 | 58 | 16 | 5,00 | 4,00 | 3 | 38373 | 7,40 | 31719 | 10,46 |
| | M6 | 1,00 | 66 | 19 | 6,30 | 5,00 | 3 | 38185 | 7,40 | 31720 | 10,46 |
| | M7 | 1,00 | 66 | 19 | 6,30 | 5,00 | 3 | 38186 | 11,98 | 70235 | 15,88 |
| | M8 | 1,25 | 72 | 22 | 8,00 | 6,30 | 3 | 38187 | 9,88 | 31721 | 13,78 |
| | M10 | 1,50 | 80 | 24 | 10,00 | 8,00 | 3 | 38188 | 12,57 | 31722 | 18,65 |
| | M12 | 1,75 | 89 | 29 | 9,00 | 7,10 | 3 | 38189 | 16,14 | 31729 | 22,78 |
| | M14 | 2,00 | 95 | 30 | 11,20 | 9,00 | 3 | 38190 | 19,30 | 31730 | 27,23 |
| | M16 | 2,00 | 102 | 32 | 12,50 | 10,00 | 3 | 38191 | 23,97 | 31732 | 33,62 |
| | M18 | 2,50 | 112 | 37 | 14,00 | 11,20 | 3 | 38192 | 36,08 | 31734 | 46,29 |
| | M20 | 2,50 | 112 | 37 | 14,00 | 11,20 | 3 | 38193 | 40,33 | 31736 | 52,63 |
| | M22 | 2,50 | 118 | 38 | 16,00 | 12,50 | 3 | 38194 | 46,63 | 31737 | 60,85 |
| | M24 | 3,00 | 130 | 45 | 18,00 | 14,00 | 3 | 38195 | 52,68 | 31746 | 67,99 |
| | M27 | 3,00 | 135 | 45 | 20,00 | 16,00 | 3 | 38196 | 64,88 | 31747 | 107,32 |
| | M30 | 3,50 | 138 | 48 | 20,00 | 16,00 | 3 | 38197 | 96,40 | 31748 | 138,83 |
| New! | M33 | 3,50 | 151 | 51 | 22,40 | 18,00 | 4 | 31585 | 120,79 | 31749 | 163,22 |
| New! | M36 | 4,00 | 162 | 57 | 25,00 | 20,00 | 4 | 31588 | 147,57 | 31751 | 197,50 |
| New! | M39 | 4,00 | 170 | 60 | 28,00 | 22,40 | 4 | 31605 | 165,36 | 31752 | 215,29 |
| New! | M42 | 4,50 | 170 | 60 | 28,00 | 22,40 | 4 | 31607 | 212,58 | 31753 | 271,99 |
| New! | M45 | 4,50 | 187 | 67 | 31,50 | 25,00 | 4 | 31609 | 268,51 | 31754 | 327,92 |
| New! | M48 | 5,00 | 187 | 67 | 31,50 | 25,00 | 4 | 31616 | 385,55 | 31755 | 448,95 |

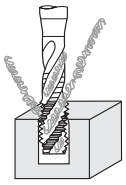


# Ref. 3157

## MACHO HELICOIDAL MÁQUINA MÉTRICA NORMA ISO 529
ISO 529 Norm Standard Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique norme ISO 529




HSS | HSS + TIN | ISO 529 | C 2-3h | Tol. 6H | 35° | α 12-14° | 60°



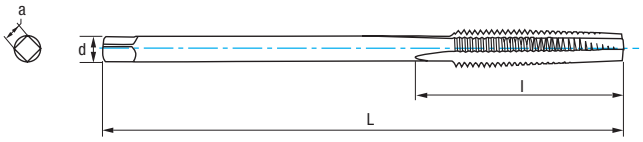

| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | HSS | TIN |
| P | P.1 | 6-10 | 9-13 |
| N | N.1 | 5-8 | 8-12 |
| | N.3 | 15-35 | 20-45 |
| | N.4 | 14-20 | 18-30 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

| | M | P | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | M3 | 0,50 | 48 | 11 | 3,15 | 2,50 | 3 | 38198 | 8,91 | 31723 | 11,74 |
| | M3,5 | 0,60 | 53 | 13 | 4,00 | 3,15 | 3 | 38199 | 14,11 | 70194 | 17,28 |
| | M4 | 0,70 | 53 | 13 | 4,00 | 3,15 | 3 | 38201 | 8,91 | 31724 | 12,08 |
| | M5 | 0,80 | 58 | 16 | 5,00 | 4,00 | 3 | 38206 | 8,91 | 31725 | 12,08 |
| | M6 | 1,00 | 66 | 19 | 6,30 | 5,00 | 3 | 38209 | 9,11 | 12168 | 12,28 |
| | M7 | 1,00 | 66 | 19 | 6,30 | 5,00 | 3 | 38211 | 14,43 | 70197 | 18,33 |
| | M8 | 1,25 | 72 | 22 | 8,00 | 6,30 | 3 | 38214 | 10,21 | 31726 | 14,11 |
| | M10 | 1,50 | 80 | 24 | 10,00 | 8,00 | 3 | 38216 | 13,15 | 31728 | 19,24 |
| | M12 | 1,75 | 89 | 29 | 9,00 | 7,10 | 3 | 38226 | 17,10 | 31756 | 23,74 |
| | M14 | 2,00 | 95 | 30 | 11,20 | 9,00 | 3 | 38228 | 23,37 | 31757 | 31,30 |
| | M16 | 2,00 | 102 | 32 | 12,50 | 10,00 | 3 | 38229 | 27,11 | 31758 | 36,76 |
| New! | M18 | 2,50 | 112 | 37 | 14,00 | 11,20 | 4 | 31627 | 40,81 | 31759 | 51,02 |
| New! | M20 | 2,50 | 118 | 38 | 16,00 | 12,50 | 4 | 31629 | 45,62 | 31760 | 57,92 |
| New! | M22 | 2,50 | 130 | 45 | 18,00 | 14,00 | 4 | 31630 | 52,74 | 31761 | 66,96 |
| New! | M24 | 3,00 | 135 | 45 | 20,00 | 16,00 | 4 | 31634 | 59,53 | 31762 | 86,41 |
| New! | M27 | 3,00 | 138 | 48 | 20,00 | 16,00 | 4 | 31635 | 73,32 | 31763 | 115,75 |
| New! | M30 | 3,50 | 151 | 51 | 22,40 | 18,00 | 4 | 31638 | 108,93 | 31764 | 151,37 |
| New! | M33 | 3,50 | 162 | 57 | 25,00 | 20,00 | 4 | 31586 | 136,50 | 31766 | 178,93 |
| New! | M36 | 4,00 | 170 | 60 | 28,00 | 22,40 | 4 | 31604 | 167,14 | 31767 | 217,07 |
| New! | M39 | 4,00 | 170 | 60 | 28,00 | 22,40 | 4 | 31606 | 187,28 | 31768 | 237,22 |
| New! | M42 | 4,50 | 187 | 67 | 31,50 | 25,00 | 4 | 31608 | 240,77 | 31769 | 300,18 |
| New! | M45 | 4,50 | 187 | 67 | 31,50 | 25,00 | 4 | 31612 | 304,12 | 31772 | 363,53 |
| New! | M48 | 5,00 | 187 | 67 | 31,50 | 25,00 | 4 | 31620 | 436,68 | 31775 | 500,08 |

# Ref. 3185

## MACHO MÁQUINA TUERCAS
Nut Tap
Taraud machine filières pour écrous



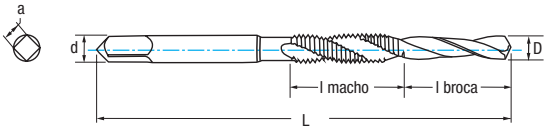

HSS | DIN 357 | 18h | Tol. 6H

**Otras Tol. bajo demanda**
**Other Tol. upon request**
Autres tol. sur demande

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **M3** | 0,50 | 70 | 22 | 2,20 | | 3 | 16332 | **20,66** |
| **M4** | 0,70 | 90 | 25 | 2,80 | 2,10 | 3 | 16333 | **20,66** |
| **M5** | 0,80 | 100 | 28 | 3,50 | 2,70 | 3 | 16334 | **20,66** |
| **M6** | 1,00 | 110 | 32 | 4,50 | 3,50 | 3 | 16335 | **20,66** |
| **M7** | 1,00 | 110 | 36 | 5,50 | 4,30 | 3 | 16336 | **26,25** |
| **M8** | 1,25 | 125 | 40 | 6,00 | 4,90 | 3 | 16337 | **24,40** |
| **M10** | 1,50 | 140 | 45 | 7,00 | 5,50 | 3 | 16338 | **28,55** |
| **M12** | 1,75 | 180 | 50 | 9,00 | 7,00 | 3 | 16339 | **46,76** |
| **M14** | 2,00 | 200 | 56 | 11,00 | 9,00 | 3 | 16340 | **57,52** |
| **M16** | 2,00 | 200 | 63 | 12,00 | 9,00 | 3 | 16342 | **73,92** |
| **M18** | 2,50 | 220 | 63 | 14,00 | 11,00 | 3 | 59877 | **79,59** |
| **M20** | 2,50 | 250 | 70 | 16,00 | 12,00 | 3 | 16343 | **110,14** |
| **M22** | 2,50 | 280 | 80 | 18,00 | 14,50 | 3 | 59878 | **118,06** |
| **M24** | 3,00 | 280 | 80 | 18,00 | 14,50 | 4 | 59879 | **139,26** |

# Ref. 3099

## BROCA-MACHO
Tap Drill
Foret taraudeur




HSSE 5%Co | Tol. 6H | **Broca-Macho Tap Drill** Foret taraudeur

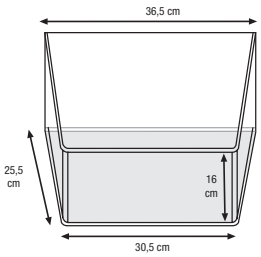
| M | P | D Broca Drill Foret mm | L mm | l Broca Drill Foret mm | l Macho Tap Taraud mm | d mm | a mm | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|---|
| **M3** | 0,50 | 2,50 | 56 | 16,00 | 11,00 | 3,00 | 2,40 | 63294 | **31,53** |
| **M4** | 0,70 | 3,30 | 63 | 18,00 | 14,00 | 4,00 | 3,00 | 63297 | **31,53** |
| **M5** | 0,80 | 4,20 | 71 | 20,00 | 18,00 | 5,00 | 3,80 | 63300 | **35,30** |
| **M6** | 1,00 | 5,00 | 80 | 22,00 | 22,00 | 6,00 | 4,90 | 63303 | **47,70** |
| **M8** | 1,25 | 6,80 | 95 | 26,00 | 25,00 | 8,00 | 6,20 | 63306 | **60,07** |
| **M10** | 1,50 | 8,50 | 106 | 30,00 | 31,00 | 10,00 | 8,00 | 63309 | **81,64** |
| **M12** | 1,75 | 10,20 | 115 | 32,00 | 35,00 | 12,00 | 9,00 | 63312 | **86,59** |

# Ref. 4995

## EXPOSITOR MACHOS MÉTRICOS MÁQUINA
Machine Metric Tap Exhibitor
Présentoir tarauds métriques machine

**66 Pcs**

| N° Art. | € |
|---|---|
| 70077 | 1.575,38 |



**Contenido:**

| Ref. | Mat. | | M | Uds. |
|---|---|---|---|---|
| 3130-3230 | HARD | Materiales duros<br>Hard Materials<br>Matériaux durs | | 1 |
| 3170-3270 | | | | 1 |
| 3143-3243 | HSSE-V | Materiales aleados<br>Alloy Materials<br>Matériaux alliages | | 1 |
| 3153-3253 | | | 4×0,70 | 1 |
| 3125-3225 | HARD | INOX<br>Alto Rendimiento<br>High Performance<br>Stainless<br>Inox<br>Haut rendement | 5×0,80 | 1 |
| | | | 6×1,00 | |
| 3165-3265 | | | 8×1,25 | 1 |
| 3149-3249 | TIN | INOX<br>Stainless Steel<br>Inoxydable | 10×1,50 | 1 |
| 3159-3259 | | | 12×1,75 | 1 |
| 3172-3272 | 5% Co | Aluminio<br>Aluminium | | 1 |
| 3100-3200 | 5% Co | Uso general<br>General Purpose<br>Utilisation générale | | 1 |
| 3150-3250 | | | | 1 |

**Apilable** / Stackable / Empilable

# SETS MACHOS
## Tap Sets
## Jeux de tarauds

**Set Price!**

**Benefíciate de un 5% de descuento extra en nuestros sets de roscado**
**Get an extra 5% discount on our threading sets**
Bénéficiez d'une remise supplémentaire de 5 % sur nos jeux de taraudage

## Sets 3125

**MACHO RECTO MÁQUINA MÉTRICA INOX GRAN RENDIMIENTO M. REFORZADO**
Reinforced Shank High Performance Stainless Metric Machine Straight Tap
Taraud droit machine métrique inox haut rendement queue renforcée

### Ref. 3125 + 1016 TIALSIN

10 Pcs

| Cont. | N° Art. TIALSIN | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 371: M4-M5-M6-M8-M10**<br>**Brocas / Drill Bits /** Forets **1016 TIALSIN: 3,3-4,2-5,0-6,8-8,5** | 32669 | Set Price!<br>**168,69** |

### Ref. 3125 + 1020 HSSE

10 Pcs

| Cont. | N° Art. 5% Co | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 371: M4-M5-M6-M8-M10**<br>**Brocas / Drill Bits /** Forets **1020 HSSE: 3,3-4,2-5,0-6,8-8,5** | 32674 | Set Price!<br>**158,18** |

## Sets 3165

**MACHO HELICOIDAL MÁQUINA MÉTRICA INOX GRAN RENDIMIENTO M. REFORZADO**
Reinforced Shank High Performance Stainless Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique inox haut rendement queue renforcée

### Ref. 3165 + 1016 TIALSIN

10 Pcs

| Cont. | N° Art. TIALSIN | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 371: M4-M5-M6-M8-M10**<br>**Brocas / Drill Bits /** Forets **1016 TIALSIN: 3,3-4,2-5,0-6,8-8,5** | 32675 | Set Price!<br>**185,73** |

### Ref. 3165 + 1020 HSSE

10 Pcs

| Cont. | N° Art. 5% Co | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 371: M4-M5-M6-M8-M10**<br>**Brocas / Drill Bits /** Forets **1020 HSSE: 3,3-4,2-5,0-6,8-8,5** | 32670 | Set Price!<br>**175,21** |

Sets
# 3143-3153

## MACHO MÁQUINA MÉTRICA MATERIALES ALEADOS MANGO REFORZADO
Reinforced Shank Alloy Materials Metric Machine Tap
Taraud machine métrique matériaux alliages queue renforcée

### Ref. 3143 + 1016 HSSE
**MACHO RECTO**
Straight Tap
Taraud Droit

10 Pcs

| Cont. | N° Art. 5% Co | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 371: M4-M5-M6-M8-M10**<br>**Brocas / Drill Bits /** Forets **1016 HSSE: 3,3-4,2-5,0-6,8-8,5** | 82434 | Set Price!<br>**92,16** |

### Ref. 3153 + 1016 HSSE
**MACHO HELICOIDAL**
Spiral Tap
Taraud Helicoïdal

10 Pcs

| Cont. | N° Art. 5% Co | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 371: M4-M5-M6-M8-M10**<br>**Brocas / Drill Bits /** Forets **1016 HSSE: 3,3-4,2-5,0-6,8-8,5** | 10555 | Set Price!<br>**100,08** |

Sets
# 3149-3159

## MACHO MÁQUINA MÉTRICA INOX MANGO REFORZADO
Reinforced Shank Stainless Metric Machine Tap
Taraud machine métrique inox queue renforcée

### Ref. 3149 + 1016 HSSE
**MACHO RECTO**
Straight Tap
Taraud Droit

New!

14 Pcs

| Cont. | N° Art. TIN | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 371: M3-M4-M5-M6-M8-M10-M12**<br>**Brocas / Drill Bits /** Forets **1016 HSSE: 2,5-3,3-4,2-5,0-6,8-8,5-10,2** | 77303 | Set Price!<br>**174,96** |

### Ref. 3159 + 1016 HSSE
**MACHO HELICOIDAL**
Spiral Tap
Taraud Helicoïdal

New!

14 Pcs

| Cont. | N° Art. TIN | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 371: M3-M4-M5-M6-M8-M10-M12**<br>**Brocas / Drill Bits /** Forets **1016 HSSE: 2,5-3,3-4,2-5,0-6,8-8,5-10,2** | 77304 | Set Price!<br>**189,71** |

# Sets 3110

## MACHO RECTO MÁQUINA MÉTRICA MANGO REFORZADO
Reinforced Shank Metric Machine Straight Tap
Taraud droit machine métrique queue renforcée

### Ref. 3110

7 Pcs

| Cont. | N° Art. 5% Co | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 371: M3-M4-M5-M6-M8-M10 + DIN 376: M12** | 43351 | **82,49** |

### Ref. 3110 + 1010 HSS

14 Pcs

| Cont. | N° Art. HSS | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 371: M3-M4-M5-M6-M8-M10 + DIN 376: M12** | 43357 | **95,77** |
| **Brocas / Drill Bits /** Forets **HSS: 2,5-3,3-4,2-5,0-6,8-8,5-10,2** | | |

### Ref. 3110 + 1016 HSSE

14 Pcs

| Cont. | N° Art. 5% Co | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 371: M3-M4-M5-M6-M8-M10 + DIN 376: M12** | 16198 | **107,02** |
| **Brocas / Drill Bits /** Forets **HSSE: 2,5-3,3-4,2-5,0-6,8-8,5-10,2** | | |

# Sets 3100

## MACHO RECTO MÁQUINA MÉTRICA MANGO REFORZADO
Reinforced Shank Metric Machine Straight Tap
Taraud droit machine métrique queue renforcée

### Ref. 3100

7 Pcs

| Cont. | N° Art. 5% Co | € |
|---|---|---|
| **Machos** **Taps /** Tarauds **DIN 371: M3-M4-M5-M6-M8-M10 + DIN 376: M12** | 43348 | **87,65** |

### Ref. 3100 + 1010 HSS

14 Pcs

| Cont. | N° Art. HSS | € |
|---|---|---|
| **Machos** **Taps /** Tarauds **DIN 371: M3-M4-M5-M6-M8-M10 + DIN 376: M12** **Brocas** **Drill Bits /** Forets **HSS:** 2,5-3,3-4,2-5,0-6,8-8,5-10,2 | 43354 | **100,93** |

### Ref. 3100 + 1016 HSSE

14 Pcs

| Cont. | N° Art. 5% Co | € |
|---|---|---|
| **Machos** **Taps /** Tarauds **DIN 371: M3-M4-M5-M6-M8-M10 + DIN 376: M12** **Brocas** **Drill Bits /** Forets **HSSE:** 2,5-3,3-4,2-5,0-6,8-8,5-10,2 | 21801 | **112,18** |

### Ref. 3100 + 1015 Zirkonio

New!

14 Pcs

| Cont. | N° Art. Zirkonio | € |
|---|---|---|
| **Machos** **Taps /** Tarauds **DIN 371: M3-M4-M5-M6-M8-M10 + DIN 376: M12** **Brocas** **Drill Bits /** Forets **HSSE:** 2,5-3,3-4,2-5,0-6,8-8,5-10,2 | 56424 | **112,82** |

25 Pcs

| Cont. | N° Art. 5% Co | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 371: M4-M5-M6-M8-M10** (5 pcs x M) | 38998 | **294,15** |

# Set 3200

## MACHO RECTO MÁQUINA MÉTRICA
Metric Machine Straight Tap
Taraud droit machine métrique

25 Pcs

| Cont. | N° Art. 5% Co | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 376: M4-M5-M6-M8-M10** (5 pcs x M) | 39000 | **301,55** |

# Sets 3150

## MACHO HELICOIDAL MÁQUINA MÉTRICA MANGO REFORZADO
Reinforced Shank Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique queue renforcée

### Ref. 3150

7 Pcs

| Cont. | N° Art. 5% Co | € |
|---|---|---|
| **Machos** Taps / Tarauds **DIN 371: M3-M4-M5-M6-M8-M10 + DIN 376: M12** | 43353 | **106,05** |

### Ref. 3150 + 1010 HSS

14 Pcs

| Cont. | N° Art. HSS | € |
|---|---|---|
| **Machos** Taps / Tarauds **DIN 371: M3-M4-M5-M6-M8-M10 + DIN 376: M12**<br>**Brocas** Drill Bits / Forets **HSS:** 2,5-3,3-4,2-5,0-6,8-8,5-10,2 | 43359 | **119,33** |

### Ref. 3150 + 1016 HSSE

14 Pcs

| Cont. | N° Art. 5% Co | € |
|---|---|---|
| **Machos** Taps / Tarauds **DIN 371: M3-M4-M5-M6-M8-M10 + DIN 376: M12**<br>**Brocas** Drill Bits / Forets **HSSE:** 2,5-3,3-4,2-5,0-6,8-8,5-10,2 | 21802 | **130,58** |

### Ref. 3150 + 1015 Zirkonio

New!

14 Pcs

| Cont. | N° Art. Zirkonio | € |
|---|---|---|
| **Machos** Taps / Tarauds **DIN 371: M3-M4-M5-M6-M8-M10 + DIN 376: M12**<br>**Brocas** Drill Bits / Forets **HSSE:** 2,5-3,3-4,2-5,0-6,8-8,5-10,2 | 56428 | **131,22** |

25 Pcs

| Cont. | N° Art. 5% Co | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 371: M4-M5-M6-M8-M10** (5 pcs x M) | 38999 | **353,05** |

# Set 3250

## MACHO HELICOIDAL MÁQUINA MÉTRICA
Metric Machine Spiral Tap
Taraud hélicoïdal machine métrique

25 Pcs

| Cont. | N° Art. 5% Co | € |
|---|---|---|
| **Machos / Taps /** Tarauds **DIN 376: M4-M5-M6-M8-M10** (5 pcs x M) | 39001 | **346,40** |

## Ref. 3405

**JUEGO MACHOS MANO MÉTRICA**
Metric Hand Tap Set
Jeu de tarauds à main métrique

### 29 Pcs

| Cont. | | N° Art. HSS | € |
|---|---|---|---|
| **Juegos Machos** / **Tap Sets** / Jeux Tarauds | **M3-M4-M5-M6-M8-M10-M12** | | |
| **Brocas** / **Drill Bits** / Forets mm | 2,5-3,3-4,2-5,0-6,8-8,5-10,2 | 69624 | **105,11** |
| **Gira-Machos** / **Tap-Wrench** / Porte-Tarauds | **M1-M12** | | |

## Ref. 3404

**JUEGO MACHOS MANO PERFIL ROSCA COMPLETA**
Whole Thread Profile Hand Tap Set
Jeu de tarauds à main profil filetage complet

### 15 Pcs

| Cont. | | N° Art. HSS | € |
|---|---|---|---|
| **Machos** / **Taps** / Tarauds | **M3-M4-M5-M6-M8-M10-M12** | | |
| **Brocas** / **Drill Bits** / Forets mm | 2,5-3,3-4,2-5,0-6,8-8,5-10,2 | 68214 | **86,46** |
| **Gira-Machos** / **Tap-Wrench** / Porte-Tarauds | **M1-M12** | | |

# Ref. 3406

## JUEGO MACHOS Y COJINETES MANO MÉTRICA
Metric Hand Tap & Die Set
Jeu de tarauds et filières à main métrique

### 33 Pcs

| Mod. 0 - Cont. | |
|---|---|
| **Juegos Machos** **Tap Sets** / Jeux Tarauds | **M3-M4-M5-M6-M8-M10-M12** |
| **Gira-Machos** **Tap-Wrench** / Porte-Tarauds | **M1-M12** |
| **Gira-Machos** **Tap-Wrench** / Porte-Tarauds | Criqué **M3-M10** Ratchet |
| **Cojinetes** **Dies** / Filières | **M3-M4-M5-M6-M8-M10-M12** |
| **Porta-Cojinetes** **Die Holder** / Porte-Filières | 25×9 |
| **Galga** **Gauge** / Gabarit | 1 pc |
| **Destornillador** **Screwdriver** / Tournevis | 1 pc |

| N° Art. HSS | € |
|---|---|
| 70527 | **133,61** |

New! ISO

| N° Art. HSS | € |
|---|---|
| 18959 | **182,52** |

### 55 Pcs

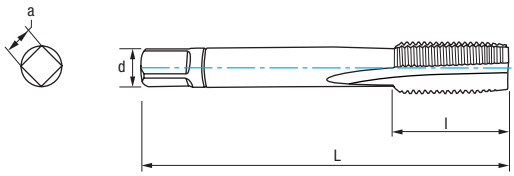
| Mod. 1 - Cont. | | N° Art. HSS | € |
|---|---|---|---|
| **Juegos Machos** **Tap Sets** / Jeux Tarauds | **M3-M4-M5-M6-M8-M10-M12-M14-M16-M18-M20** | | |
| **Gira-Machos** **Tap-Wrench** / Porte-Tarauds | **M1-M12, M5-M20** | | |
| **Gira-Machos** **Tap-Wrench** / Porte-Tarauds | Criqué **M3-M10 + M5-M12** Ratchet | | |
| **Cojinetes** **Dies** / Filières | **M3-M4-M5-M6-M8-M10-M12-M14-M16-M18-M20** | 38404 | **399,59** |
| **Porta-Cojinetes** **Die Holder** / Porte-Filières | 20×5, 20×7, 25×9, 30×11, 38×14, 45×18 | | |
| **Galga** **Gauge** / Gabarit | 1 pc | | |
| **Destornillador** **Screwdriver** / Tournevis | 1 pc | | |

### 45 Pcs

| Mod. 2 - Cont. | | N° Art. HSS | € |
|---|---|---|---|
| **Juegos Machos** **Tap Sets** / Jeux Tarauds | **M3-M4-M5-M6-M8-M10-M12** | | |
| **Gira-Machos** **Tap-Wrench** / Porte-Tarauds | **M1-M10, M4-M12** | | |
| **Gira-Machos** **Tap-Wrench** / Porte-Tarauds | Criqué **M3-M10** Ratchet | | |
| **Cojinetes** **Dies** / Filières | **M3-M4-M5-M6-M8-M10-M12** | 38981 | **195,99** |
| **Porta-Cojinetes** **Die Holder** / Porte-Filières | 20×5, 20×7, 25×9, 30×11, 38×14 | | |
| **Galga** **Gauge** / Gabarit | 1 pc | | |
| **Destornillador** **Screwdriver** / Tournevis | 1 pc | | |
| **Brocas** **Drill Bits** / Forets mm | 2,5-3,3-4,2-5,0-6,8-8,5-10,2 | | |

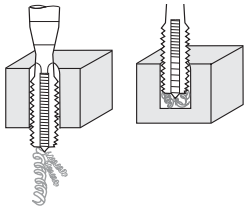
# Ref. 3036

## JUEGO MACHOS MANO MÉTRICA/ MÉTRICA FINA COBALTO INOX
STAINLESS Cobalt Metric / Metric Fine Hand Tap Set
Jeu de tarauds à main métrique / métrique pas fin cobalt INOX




| HSSE 5%Co | M DIN 352 | MF DIN 2181 | C 2-3h | Tol. 6H | **Vaporizado** Vaporized Vaporisée | | α 6 - 8° | 60° |
|---|---|---|---|---|---|---|---|---|

| **N°1 Desbaste** Roughing Ébauche | **N°2 Semidesbaste** Semiroughing Semi-Ébauche | **N°3 Acabado** Finishing Finition | **N°1-N°2 Con guía** Guided Avec Guide | **Grupo** Group-Groupe **P** | **Subgrup.** **P.5** | **Grupo** Group-Groupe **M** | **Grupo** Group-Groupe **K** |
|---|---|---|---|---|---|---|---|

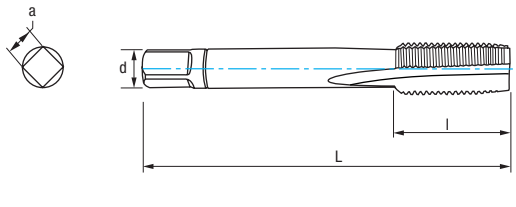


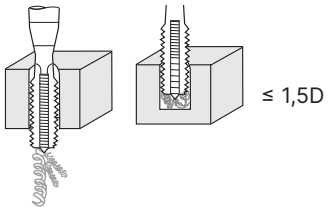

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **M2** | **0,40** | 36 | 8 | 2,80 | 2,10 | 3 | 69229 | **38,15** |
| **M3** | **0,50** | 40 | 11 | 3,50 | 2,70 | 3 | 16404 | **30,52** |
| **M4** | **0,70** | 45 | 13 | 4,50 | 3,40 | 3 | 16405 | **30,52** |
| **M5** | **0,80** | 50 | 16 | 6,00 | 4,90 | 3 | 16406 | **31,78** |
| MF6 | 0,75 | 56 | 14 | 6,00 | 4,90 | 3 | 82254 | **59,06** |
| **M6** | **1,00** | 56 | 19 | 6,00 | 4,90 | 3 | 16407 | **31,78** |
| MF8 | 1,00 | 63 | 18 | 6,00 | 4,90 | 3 | 82255 | **59,06** |
| **M8** | **1,25** | 63 | 22 | 6,00 | 4,90 | 3 | 16408 | **36,90** |
| MF10 | 1,00 | 63 | 18 | 7,00 | 5,50 | 3 | 82256 | **65,57** |
| **M10** | **1,50** | 70 | 24 | 7,00 | 5,50 | 3 | 16409 | **47,46** |
| MF12 | 1,00 | 70 | 18 | 9,00 | 7,00 | 3 | 82257 | **74,89** |
| MF12 | 1,50 | 70 | 22 | 9,00 | 7,00 | 3 | 82258 | **73,16** |
| **M12** | **1,75** | 75 | 29 | 9,00 | 7,00 | 3 | 16410 | **67,92** |
| MF14 | 1,50 | 70 | 22 | 11,00 | 9,00 | 4 | 82259 | **91,18** |
| **M14** | **2,00** | 80 | 30 | 11,00 | 9,00 | 4 | 16411 | **75,22** |
| MF16 | 1,50 | 70 | 22 | 12,00 | 9,00 | 4 | 82290 | **94,45** |
| **M16** | **2,00** | 80 | 32 | 12,00 | 9,00 | 4 | 16412 | **103,09** |
| MF18 | 1,50 | 80 | 22 | 14,00 | 11,00 | 4 | 82260 | **137,88** |
| **M18** | **2,50** | 95 | 40 | 14,00 | 11,00 | 4 | 16413 | **140,81** |
| MF20 | 1,50 | 80 | 22 | 16,00 | 12,00 | 4 | 82261 | **134,18** |
| **M20** | **2,50** | 95 | 40 | 16,00 | 12,00 | 4 | 16414 | **156,34** |

**Macho único Ref. 3037 disponible en pag. 265 / Single Tap Ref. 3037 available in page 265 /** Taraud unique Ref. 3037 disponible pag. 265

# Ref. 3030

## JUEGO MACHOS MANO MÉTRICA
Metric Hand Tap Set
Jeu de tarauds à main métrique




HSS | DIN 352 | C 2-3h | Tol. 6H | α 10° ± 2 | 60°

**N°1 Desbaste** Roughing Ébauche | **N°2 Semidesbaste** Semiroughing Semi-Ébauche | **N°3 Acabado** Finishing - Finition **(Ref. 3010)**

Grupo Group-Groupe **P** — Subgrup. P.1 | Grupo Group-Groupe **K** | Grupo Group-Groupe **N** — Subgrup. N.1 - N.3 N.4 - N.5

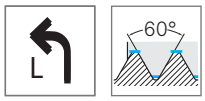
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| M2 | 0,40 | 36 | 8 | 2,80 | 2,10 | 3 | 62531 | 29,17 |
| M2,5 | 0,45 | 40 | 9 | 2,80 | 2,10 | 3 | 62534 | 29,17 |
| M3 | 0,50 | 40 | 11 | 3,50 | 2,70 | 3 | 62537 | 16,51 |
| M3,5 | 0,60 | 45 | 13 | 4,00 | 3,00 | 3 | 62540 | 19,45 |
| M4 | 0,70 | 45 | 13 | 4,50 | 3,40 | 3 | 62543 | 16,51 |
| M4 | 0,75 | 45 | 14 | 4,50 | 3,40 | 3 | 76377 | 28,58 |
| M4,5 | 0,75 | 50 | 16 | 6,00 | 4,90 | 3 | 62546 | 29,17 |
| M5 | 0,80 | 50 | 16 | 6,00 | 4,90 | 3 | 62549 | 17,50 |
| M6 | 1,00 | 56 | 19 | 6,00 | 4,90 | 3 | 62552 | 17,50 |
| M7 | 1,00 | 56 | 19 | 6,00 | 4,90 | 3 | 62555 | 21,39 |
| M8 | 1,25 | 56 | 22 | 6,00 | 4,90 | 4 | 62561 | 21,39 |
| M9 | 1,25 | 63 | 22 | 7,00 | 5,50 | 4 | 62567 | 34,99 |
| M10 | 1,50 | 70 | 24 | 7,00 | 5,50 | 4 | 62573 | 26,27 |
| M11 | 1,50 | 70 | 24 | 8,00 | 6,20 | 4 | 62576 | 43,73 |
| M12 | 1,75 | 75 | 28 | 9,00 | 7,00 | 4 | 62579 | 36,93 |
| M13 | 1,75 | 75 | 28 | 9,00 | 7,00 | 4 | 62582 | 67,06 |
| M14 | 2,00 | 80 | 30 | 11,00 | 9,00 | 4 | 62585 | 40,84 |

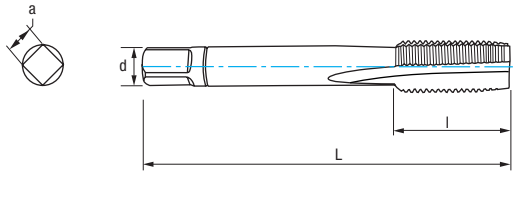
| M | P | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| M15 | 2,00 | 80 | 32 | 12,00 | 9,00 | 4 | 62588 | 81,65 |
| M16 | 2,00 | 80 | 32 | 12,00 | 9,00 | 4 | 62591 | 57,95 |
| M18 | 2,50 | 95 | 34 | 14,00 | 11,00 | 4 | 62594 | 76,80 |
| M20 | 2,50 | 95 | 34 | 16,00 | 12,00 | 4 | 62597 | 86,53 |
| M22 | 2,50 | 100 | 34 | 18,00 | 14,50 | 4 | 62603 | 115,70 |
| M24 | 3,00 | 110 | 50 | 18,00 | 14,50 | 4 | 62606 | 135,59 |
| M27 | 3,00 | 110 | 50 | 20,00 | 16,00 | 4 | 62609 | 174,49 |
| M30 | 3,50 | 125 | 50 | 22,00 | 18,00 | 4 | 62612 | 223,56 |
| M33 | 3,50 | 125 | 50 | 25,00 | 20,00 | 4 | 62615 | 281,90 |
| M36 | 4,00 | 150 | 56 | 28,00 | 22,00 | 4 | 62618 | 359,63 |
| M39 | 4,00 | 150 | 60 | 32,00 | 24,00 | 4 | 62621 | 402,46 |
| M42 | 4,50 | 150 | 60 | 32,00 | 24,00 | 4 | 62624 | 503,54 |
| M45 | 4,50 | 160 | 65 | 36,00 | 29,00 | 6 | 73760 | 581,31 |
| M48 | 5,00 | 180 | 70 | 36,00 | 29,00 | 6 | 62627 | 699,89 |
| M52 | 5,00 | 180 | 70 | 40,00 | 32,00 | 6 | 76382 | 849,61 |
| M56 | 5,50 | 180 | 70 | 40,00 | 32,00 | 6 | 76383 | 1.310,20 |
| M60 | 5,50 | 200 | 85 | 45,00 | 35,00 | 6 | 76384 | 1.639,82 |

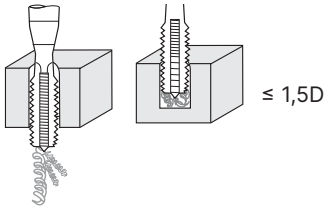
**Macho único Ref. 3010 disponible en pag. 266 / Single Tap Ref. 3010 available in page 266 /** Taraud unique Ref. 3010 disponible pag. 266

# Ref. 3031

## JUEGO MACHOS MANO MÉTRICA CORTE IZQUIERDA
Left Cutting Metric Hand Tap Set
Jeu de tarauds à main métrique coupe à gauche



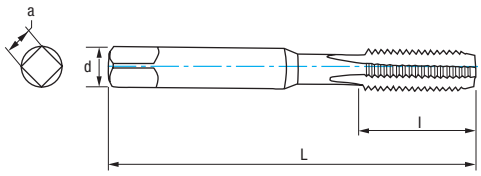

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| M3 | 0,50 | 40 | 11 | 3,50 | 2,70 | 3 | 23302 | 34,00 |
| M3,5 | 0,60 | 45 | 13 | 4,00 | 3,00 | 3 | 23303 | 40,02 |
| M4 | 0,70 | 45 | 13 | 4,50 | 3,40 | 3 | 23304 | 34,00 |
| M4,5 | 0,75 | 50 | 16 | 6,00 | 4,90 | 3 | 23305 | 60,03 |
| M5 | 0,80 | 50 | 16 | 6,00 | 4,90 | 3 | 23306 | 36,04 |
| M6 | 1,00 | 50 | 19 | 6,00 | 4,90 | 3 | 23307 | 36,04 |
| M7 | 1,00 | 50 | 19 | 6,00 | 4,90 | 3 | 23308 | 44,01 |
| M8 | 1,25 | 56 | 22 | 6,00 | 4,90 | 4 | 23309 | 44,01 |

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| M9 | 1,25 | 63 | 22 | 7,00 | 5,50 | 4 | 23310 | 72,05 |
| M10 | 1,50 | 70 | 24 | 7,00 | 5,50 | 4 | 23311 | 54,03 |
| M11 | 1,50 | 70 | 24 | 8,00 | 6,20 | 4 | 23312 | 90,03 |
| M12 | 1,75 | 75 | 29 | 9,00 | 7,00 | 4 | 23313 | 76,01 |
| M14 | 2,00 | 80 | 30 | 11,00 | 9,00 | 4 | 23314 | 84,07 |
| M16 | 2,00 | 80 | 32 | 12,00 | 9,00 | 4 | 23315 | 119,28 |
| M18 | 2,50 | 95 | 40 | 14,00 | 11,00 | 4 | 23316 | 158,06 |
| M20 | 2,50 | 95 | 40 | 16,00 | 12,00 | 4 | 23317 | 178,08 |

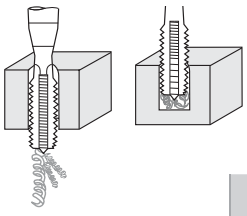
# Ref. 3040

## JUEGO MACHOS ÚNICOS MANO MÉTRICA NORMA ISO
ISO Standard Metric Hand Single Tap Set
Jeu de tarauds uniques à main métrique norme ISO

C 2-3h
B 3,5-5h
A 6-8h




HSS | ISO 529 | Tol. 6H | A 6-8h | B 3,5-5h | C 2-3h | α 10° ± 2 | 60° | **Nº3 Acabado Finishing** Finition



≤ 1,5D

| Grupo Group-Groupe | Subgrup. |
|---|---|
| **P** | **P.1** |

| Grupo Group-Groupe | |
|---|---|
| **K** | |

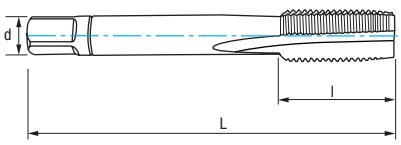
| Grupo Group-Groupe | Subgrup. |
|---|---|
| **N** | **N.1 - N.2 N.3 - N.4 - N.5** |

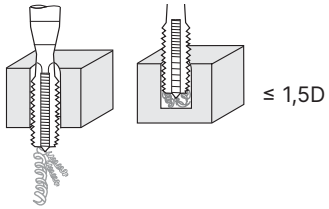
| M | P | L mm | l mm | d mm | a mm | z | Nº Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **M2** | **0,40** | 41 | 8 | 2,50 | 2,00 | 3 | 83527 | **29,17** |
| **M3** | **0,50** | 48 | 11 | 3,15 | 2,50 | 3 | 68870 | **16,51** |
| **M4** | **0,70** | 53 | 13 | 4,00 | 3,15 | 3 | 68871 | **16,51** |
| **M5** | **0,80** | 58 | 16 | 5,00 | 4,00 | 3 | 68872 | **17,50** |
| **M6** | **1,00** | 66 | 19 | 6,30 | 5,00 | 3 | 68873 | **17,50** |
| **M8** | **1,25** | 72 | 22 | 8,00 | 6,30 | 4 | 68874 | **21,39** |
| **M10** | **1,50** | 80 | 24 | 10,00 | 8,00 | 4 | 68875 | **26,27** |
| **M12** | **1,75** | 89 | 29 | 9,00 | 7,10 | 4 | 68876 | **36,93** |
| **M14** | **2,00** | 95 | 30 | 11,20 | 9,00 | 4 | 68877 | **40,84** |
| **M16** | **2,00** | 102 | 32 | 12,50 | 10,00 | 4 | 68878 | **57,95** |

**PASTA DE CORTE**
Cutting Paste
Pâte de coupe
**Pág. 654**

# Ref. 3020

## JUEGO MACHOS MANO MÉTRICA FINA
Metric Fine Hand Tap Set
Jeu de tarauds à main métrique pas fin




| HSS | DIN 2181 | C 2-3h | Tol. 6H | | α 10° ± 2 | 60° | **N°1 Desbaste Roughing** Ébauche | **N°3 Acabado Finishing** - Finition **(Ref. 3010)** |
|---|---|---|---|---|---|---|---|---|

| Grupo Group-Groupe | Subgrup. | Grupo Group-Groupe | Grupo Group-Groupe | Subgrup. |
|---|---|---|---|---|
| **P** | **P.1** | **K** | **N** | **N.1 - N.3 N.4 - N.5** |

| MF | P | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| MF4 | **0,50** | 45 | 10 | 4,50 | 3,40 | 3 | 62336 | **32,87** |
| MF5 | **0,50** | 50 | 12 | 6,00 | 4,90 | 3 | 62342 | **32,70** |
| MF5 | **0,75** | 50 | 12 | 6,00 | 4,90 | 3 | 62345 | **33,07** |
| MF6 | **0,50** | 50 | 14 | 6,00 | 4,90 | 3 | 62351 | **23,36** |
| MF6 | **0,75** | 50 | 14 | 6,00 | 4,90 | 3 | 62354 | **19,79** |
| MF7 | **0,75** | 50 | 14 | 6,00 | 4,90 | 3 | 62360 | **30,11** |
| MF8 | **0,50** | 50 | 19 | 6,00 | 4,90 | 4 | 62366 | **44,79** |
| MF8 | **0,75** | 50 | 19 | 6,00 | 4,90 | 4 | 62369 | **27,19** |
| MF8 | **1,00** | 56 | 20 | 6,00 | 4,90 | 4 | 62372 | **19,70** |
| MF9 | **1,00** | 63 | 20 | 7,00 | 5,50 | 4 | 75090 | **33,43** |
| MF10 | **0,50** | 63 | 20 | 7,00 | 5,50 | 4 | 21727 | **42,72** |
| MF10 | **0,75** | 63 | 20 | 7,00 | 5,50 | 4 | 76309 | **50,56** |
| MF10 | **1,00** | 63 | 20 | 7,00 | 5,50 | 4 | 62378 | **21,23** |
| MF10 | **1,25** | 70 | 24 | 7,00 | 5,50 | 4 | 62381 | **21,50** |
| MF11 | **0,75** | 63 | 20 | 8,00 | 6,20 | 4 | 16118 | **104,76** |
| MF11 | **1,00** | 63 | 20 | 8,00 | 6,20 | 4 | 76311 | **46,62** |
| MF11 | **1,25** | 63 | 20 | 8,00 | 6,20 | 4 | 75298 | **46,62** |
| MF12 | **0,75** | 70 | 22 | 9,00 | 7,00 | 4 | 76312 | **57,90** |
| MF12 | **1,00** | 70 | 20 | 9,00 | 7,00 | 4 | 62387 | **37,12** |
| MF12 | **1,25** | 70 | 22 | 9,00 | 7,00 | 4 | 62390 | **37,19** |
| MF12 | **1,50** | 70 | 22 | 9,00 | 7,00 | 4 | 62393 | **31,70** |
| MF13 | **0,75** | 70 | 22 | 11,00 | 9,00 | 4 | 56832 | **104,76** |
| MF13 | **1,00** | 70 | 20 | 11,00 | 9,00 | 4 | 76314 | **66,31** |
| MF13 | **1,25** | 70 | 22 | 11,00 | 9,00 | 4 | 76315 | **58,59** |
| MF13 | **1,50** | 70 | 22 | 11,00 | 9,00 | 4 | 62399 | **58,59** |
| MF14 | **0,75** | 70 | 22 | 11,00 | 9,00 | 4 | 56833 | **103,13** |
| MF14 | **1,00** | 70 | 20 | 11,00 | 9,00 | 4 | 62402 | **66,31** |
| MF14 | **1,25** | 70 | 20 | 11,00 | 9,00 | 4 | 62405 | **45,43** |
| MF14 | **1,50** | 70 | 20 | 11,00 | 9,00 | 4 | 62408 | **35,30** |
| MF14 | **1,75** | 70 | 30 | 11,00 | 9,00 | 4 | 10875 | **135,39** |
| MF15 | **1,00** | 70 | 20 | 12,00 | 9,00 | 4 | 76318 | **92,79** |
| MF15 | **1,25** | 70 | 22 | 12,00 | 9,00 | 4 | 76319 | **84,56** |
| MF15 | **1,50** | 70 | 20 | 12,00 | 9,00 | 4 | 75299 | **85,95** |
| MF16 | **1,00** | 70 | 20 | 12,00 | 9,00 | 4 | 62414 | **92,84** |
| MF16 | **1,25** | 70 | 20 | 12,00 | 9,00 | 4 | 76320 | **97,74** |
| MF16 | **1,50** | 70 | 20 | 12,00 | 9,00 | 4 | 62417 | **44,19** |
| MF17 | **1,00** | 70 | 22 | 12,00 | 9,00 | 4 | 76321 | **124,64** |
| MF17 | **1,25** | 70 | 22 | 12,00 | 9,00 | 4 | 56834 | **124,64** |
| MF17 | **1,50** | 70 | 22 | 12,00 | 9,00 | 4 | 62420 | **124,64** |
| MF18 | **1,00** | 80 | 22 | 14,00 | 11,00 | 4 | 62423 | **103,25** |
| MF18 | **1,25** | 80 | 22 | 14,00 | 11,00 | 4 | 76323 | **122,85** |
| MF18 | **1,50** | 80 | 22 | 14,00 | 11,00 | 4 | 62426 | **58,36** |

| MF | P | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| MF18 | **2,00** | 80 | 22 | 14,00 | 11,00 | 4 | 62429 | **110,15** |
| MF19 | **1,00** | 80 | 22 | 14,00 | 11,00 | 4 | 10831 | **180,90** |
| MF19 | **1,25** | 80 | 22 | 14,00 | 11,00 | 4 | 56835 | **180,75** |
| MF19 | **1,50** | 80 | 22 | 14,00 | 11,00 | 4 | 76326 | **180,90** |
| MF19 | **2,00** | 80 | 22 | 14,00 | 11,00 | 4 | 56837 | **215,49** |
| MF20 | **1,00** | 80 | 22 | 16,00 | 12,00 | 4 | 76327 | **136,77** |
| MF20 | **1,25** | 80 | 22 | 16,00 | 12,00 | 4 | 74816 | **180,90** |
| MF20 | **1,50** | 80 | 22 | 16,00 | 12,00 | 4 | 62435 | **73,16** |
| MF20 | **2,00** | 80 | 22 | 16,00 | 12,00 | 4 | 62438 | **114,69** |
| MF21 | **1,00** | 80 | 22 | 16,00 | 12,00 | 4 | 56838 | **233,78** |
| MF21 | **1,25** | 80 | 22 | 16,00 | 12,00 | 4 | 56840 | **233,78** |
| MF21 | **1,50** | 80 | 22 | 16,00 | 12,00 | 4 | 75300 | **184,86** |
| MF22 | **1,00** | 80 | 22 | 18,00 | 14,50 | 4 | 76330 | **153,29** |
| MF22 | **1,25** | 80 | 22 | 18,00 | 14,50 | 4 | 74601 | **180,90** |
| MF22 | **1,50** | 80 | 22 | 18,00 | 14,50 | 4 | 62441 | **79,77** |
| MF22 | **2,00** | 80 | 22 | 18,00 | 14,50 | 4 | 62444 | **127,73** |
| MF23 | **1,00** | 80 | 22 | 18,00 | 14,50 | 4 | 56841 | **233,54** |
| MF23 | **1,50** | 80 | 22 | 18,00 | 14,50 | 4 | 56842 | **233,54** |
| MF24 | **1,00** | 90 | 22 | 18,00 | 14,50 | 4 | 76333 | **143,55** |
| MF24 | **1,25** | 90 | 22 | 18,00 | 14,50 | 4 | 62447 | **233,78** |
| MF24 | **1,50** | 90 | 22 | 18,00 | 14,50 | 4 | 62450 | **101,82** |
| MF24 | **2,00** | 90 | 22 | 18,00 | 14,50 | 4 | 62453 | **171,38** |
| MF25 | **1,00** | 90 | 22 | 18,00 | 14,50 | 4 | 76334 | **204,55** |
| MF25 | **1,25** | 90 | 22 | 18,00 | 14,50 | 4 | 56843 | **333,06** |
| MF25 | **1,50** | 90 | 22 | 18,00 | 14,50 | 4 | 75301 | **200,97** |
| MF25 | **2,00** | 90 | 22 | 18,00 | 14,50 | 4 | 56844 | **342,58** |
| MF26 | **1,00** | 90 | 22 | 18,00 | 14,50 | 4 | 56846 | **178,75** |
| MF26 | **1,50** | 90 | 22 | 18,00 | 14,50 | 4 | 75302 | **193,99** |
| MF26 | **2,00** | 90 | 22 | 18,00 | 14,50 | 4 | 56847 | **196,77** |
| MF27 | **1,00** | 90 | 22 | 20,00 | 16,00 | 4 | 76338 | **196,81** |
| MF27 | **1,50** | 90 | 22 | 20,00 | 16,00 | 4 | 76339 | **213,88** |
| MF27 | **2,00** | 90 | 22 | 20,00 | 16,00 | 4 | 75303 | **237,59** |
| MF28 | **1,00** | 90 | 22 | 20,00 | 16,00 | 4 | 76340 | **333,37** |
| MF28 | **1,50** | 90 | 22 | 20,00 | 16,00 | 4 | 76341 | **215,48** |
| MF30 | **1,00** | 90 | 22 | 22,00 | 18,00 | 4 | 76342 | **206,85** |
| MF30 | **1,50** | 90 | 22 | 22,00 | 18,00 | 4 | 76343 | **223,50** |
| MF30 | **2,00** | 90 | 22 | 22,00 | 18,00 | 4 | 75304 | **257,62** |
| New! MF30 | **3,00** | 90 | 22 | 22,00 | 18,00 | 4 | 14421 | **257,62** |
| MF32 | **1,50** | 90 | 22 | 22,00 | 18,00 | 4 | 76345 | **258,03** |
| MF33 | **1,50** | 100 | 25 | 25,00 | 20,00 | 4 | 76348 | **303,28** |
| MF33 | **2,00** | 100 | 25 | 25,00 | 20,00 | 4 | 75305 | **383,02** |
| MF34 | **1,50** | 100 | 25 | 28,00 | 22,00 | 4 | 76349 | **316,10** |

# Ref. 3020

## JUEGO MACHOS MANO MÉTRICA FINA
Metric Fine Hand Tap Set
Jeu de tarauds à main métrique pas fin

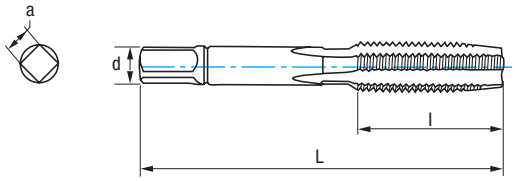
**Cont.**

| MF | P | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| MF35 | **1,50** | 100 | 25 | 28,00 | 22,00 | 4 | 76350 | **316,10** |
| MF36 | **1,50** | 100 | 25 | 28,00 | 22,00 | 4 | 76351 | **348,15** |
| MF36 | **2,00** | 125 | 33 | 28,00 | 22,00 | 4 | 76140 | **445,51** |
| MF36 | **3,00** | 125 | 33 | 28,00 | 22,00 | 4 | 76352 | **511,12** |
| MF38 | **1,50** | 100 | 25 | 28,00 | 22,00 | 4 | 76353 | **391,55** |
| MF38 | **2,00** | 125 | 40 | 28,00 | 22,00 | 4 | 75306 | **465,45** |
| MF39 | **1,50** | 110 | 25 | 32,00 | 24,00 | 4 | 76354 | **511,12** |
| MF39 | **2,00** | 125 | 33 | 32,00 | 24,00 | 4 | 76355 | **610,45** |
| MF39 | **3,00** | 125 | 33 | 32,00 | 24,00 | 4 | 76356 | **511,12** |
| MF40 | **1,50** | 110 | 25 | 32,00 | 24,00 | 6 | 76357 | **459,96** |
| MF40 | **2,00** | 110 | 25 | 32,00 | 24,00 | 6 | 76358 | **449,23** |
| MF40 | **3,00** | 125 | 40 | 32,00 | 24,00 | 6 | 76359 | **445,06** |

| MF | P | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| MF42 | **2,00** | 125 | 33 | 32,00 | 24,00 | 6 | 76361 | **611,27** |
| MF42 | **3,00** | 125 | 33 | 32,00 | 24,00 | 6 | 76362 | **611,27** |
| MF45 | **1,50** | 110 | 25 | 36,00 | 29,00 | 6 | 76363 | **481,62** |
| MF45 | **2,00** | 125 | 33 | 36,00 | 29,00 | 6 | 76364 | **733,86** |
| MF45 | **3,00** | 125 | 33 | 36,00 | 29,00 | 6 | 76365 | **786,79** |
| MF48 | **1,50** | 140 | 33 | 36,00 | 29,00 | 6 | 76366 | **542,71** |
| MF48 | **2,00** | 140 | 33 | 36,00 | 29,00 | 6 | 76367 | **889,26** |
| MF48 | **3,00** | 140 | 33 | 36,00 | 29,00 | 6 | 76368 | **889,32** |
| MF50 | **1,50** | 140 | 40 | 36,00 | 29,00 | 6 | 76369 | **593,52** |
| MF52 | **1,50** | 140 | 40 | 40,00 | 32,00 | 6 | 76370 | **629,62** |
| MF52 | **2,00** | 140 | 40 | 40,00 | 32,00 | 6 | 77643 | **905,81** |
| MF52 | **3,00** | 140 | 40 | 40,00 | 32,00 | 6 | 76372 | **840,98** |

# Ref. 3021

## JUEGO MACHOS MANO MÉTRICA FINA CORTE IZQUIERDA
Left Cutting Metric Fine Hand Tap Set
Jeu de tarauds à main métrique pas fin coupe à gauche




HSS | DIN 2181 | C 2-3h | Tol. 6H | α 10° ± 2 | **N°1 Desbaste** Roughing Ébauche | **N°3 Acabado** Finishing - Finition | 60° | L

| Grupo Group-Groupe | Subgrup. |
|---|---|
| **P** | **P.1** |

| Grupo Group-Groupe | Subgrup. |
|---|---|
| **K** | |

| Grupo Group-Groupe | Subgrup. |
|---|---|
| **N** | **N.1 - N.3 N.4 - N.5** |

| MF | P | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| MF8 | **1,00** | 56 | 22 | 6,00 | 4,90 | 4 | 18877 | **39,44** |
| MF10 | **1,00** | 63 | 20 | 7,00 | 5,50 | 4 | 22028 | **42,46** |
| MF10 | **1,25** | 70 | 24 | 7,00 | 5,50 | 4 | 21874 | **43,01** |
| MF12 | **1,25** | 70 | 22 | 9,00 | 7,00 | 4 | 34029 | **74,40** |
| MF12 | **1,50** | 70 | 22 | 9,00 | 7,00 | 4 | 34030 | **63,43** |
| MF14 | **1,25** | 70 | 22 | 11,00 | 9,00 | 4 | 38318 | **90,83** |
| MF14 | **1,50** | 70 | 22 | 11,00 | 9,00 | 4 | 10531 | **70,61** |
| MF16 | **1,50** | 70 | 22 | 12,00 | 9,00 | 4 | 13143 | **88,35** |
| MF20 | **1,50** | 80 | 22 | 16,00 | 12,00 | 4 | 19101 | **146,30** |

Ref. 3020

Ref. 3021

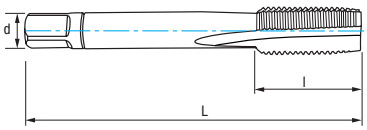
# Ref. 3037

## MACHO ÚNICO MÉTRICA/ MÉTRICA FINA COBALTO INOX
STAINLESS Cobalt Metric / Metric Fine Hand Single Tap
Taraud à main unique métrique / métrique pas fin cobalt INOX

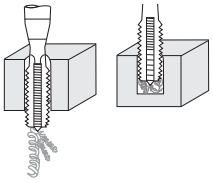
| M | P | L mm | l mm | d mm | a mm | Z | Nº 3 Acabado Finishing Finition N° Art. 5% Co | Nº 1 Desbaste Roughing Ébauche N° Art. 5% Co | Nº 2 Semidesbaste Semiroughing Semi-Ébauche N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **M2** | **0,40** | 36 | 8 | 2,80 | 2,10 | 3 | 83127 | 83125 | 83126 | **12,96** |
| **M3** | **0,50** | 40 | 11 | 3,50 | 2,70 | 3 | 74981 | 74979 | 74980 | **10,37** |
| **M4** | **0,70** | 45 | 13 | 4,50 | 3,40 | 3 | 75010 | 74982 | 74983 | **10,37** |
| **M5** | **0,80** | 50 | 16 | 6,00 | 4,90 | 3 | 74986 | 74984 | 74985 | **10,79** |
| MF6 | 0,75 | 56 | 14 | 6,00 | 4,90 | 3 | 82264 | 82262 | | **29,51** |
| **M6** | **1,00** | 56 | 19 | 6,00 | 4,90 | 3 | 74990 | 74988 | 74989 | **10,79** |
| MF8 | 1,00 | 63 | 18 | 6,00 | 4,90 | 3 | 82267 | 82265 | | **29,51** |
| **M8** | **1,25** | 63 | 22 | 6,00 | 4,90 | 3 | 74993 | 74991 | 74992 | **12,55** |
| MF10 | 1,00 | 63 | 18 | 7,00 | 5,50 | 3 | 82270 | 82268 | | **32,81** |
| **M10** | **1,50** | 70 | 24 | 7,00 | 5,50 | 3 | 74998 | 74994 | 74997 | **16,14** |
| MF12 | 1,00 | 70 | 18 | 9,00 | 7,00 | 3 | 82273 | 82271 | | **37,47** |
| MF12 | 1,50 | 70 | 22 | 9,00 | 7,00 | 3 | 82276 | 82274 | | **36,59** |
| **M12** | **1,75** | 75 | 29 | 9,00 | 7,00 | 3 | 75003 | 74999 | 75000 | **23,09** |
| MF14 | 1,50 | 70 | 22 | 11,00 | 9,00 | 4 | 82279 | 82277 | | **45,60** |
| **M14** | **2,00** | 80 | 30 | 11,00 | 9,00 | 4 | 75006 | 75004 | 75005 | **25,59** |
| MF16 | 1,50 | 70 | 22 | 12,00 | 9,00 | 4 | 82283 | 82280 | | **47,22** |
| **M16** | **2,00** | 80 | 32 | 12,00 | 9,00 | 4 | 74974 | 72865 | 72864 | **35,06** |
| MF18 | 1,50 | 80 | 22 | 14,00 | 11,00 | 4 | 82286 | 82284 | | **68,90** |
| **M18** | **2,50** | 95 | 40 | 14,00 | 11,00 | 4 | 75009 | 75007 | 75008 | **47,88** |
| MF20 | 1,50 | 80 | 22 | 16,00 | 12,00 | 4 | 82289 | 82287 | | **67,10** |
| **M20** | **2,50** | 95 | 40 | 16,00 | 12,00 | 4 | 59960 | 74131 | 74977 | **53,16** |

# Ref. 3010

## MACHO ÚNICO MANO MÉTRICA/ MÉTRICA FINA
Metric / Metric Fine Hand Single Tap
Taraud à main unique métrique / métrique pas fin




| HSS | M DIN 352 (Ref. 3030) | MF DIN 2181 (Ref. 3020) | C 2-3h | Tol. 6H | | α 10° ± 2 | 60° |
|---|---|---|---|---|---|---|---|




| Grupo Group-Groupe | Subgrup. | Grupo Group-Groupe | Grupo Group-Groupe | Subgrup. |
|---|---|---|---|---|
| P | P.1 | K | N | N.1 - N.3 N.4 - N.5 |

| | | | | | | | N°3 Acabado Finishing Finition (M Ref. 3030 / MF Ref. 3020) | | N° 1 Desbaste M Roughing Ébauche (Ref. 3030) | | N° 2 Semidesbaste M Semiroughing Semi-ébauche (Ref. 3030) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M/MF | P | L mm | l mm | d mm | a mm | z | N° Art. HSS | € | N° Art. HSS | € | N° Art. HSS | € |
| **M2** | **0,40** | 36 | 8 | 2,80 | 2,10 | 3 | 76385 | **9,97** | 22710 | **9,97** | 33368 | **9,97** |
| **M2** | **0,45** | 41 | 8 | 2,50 | 2,00 | 3 | 16451 | **9,97** | | | | |
| **M2,5** | **0,45** | 40 | 9 | 2,80 | 2,10 | 3 | 76387 | **9,97** | | | | |
| **M3** | **0,50** | 40 | 11 | 3,50 | 2,70 | 3 | 76389 | **5,67** | 11158 | **5,67** | 12723 | **5,67** |
| **M3,5** | **0,60** | 45 | 13 | 4,00 | 3,00 | 3 | 76391 | **6,70** | 66186 | **6,70** | 20538 | **6,70** |
| MF4 | 0,50 | 45 | 10 | 4,50 | 3,40 | 3 | 76393 | **16,43** | | | | |
| **M4** | **0,70** | 45 | 13 | 4,50 | 3,40 | 3 | 76394 | **5,67** | 18943 | **5,67** | 11263 | **5,67** |
| **M4,5** | **0,75** | 50 | 16 | 6,00 | 4,90 | 3 | 76397 | **9,99** | 66187 | **9,99** | 66192 | **9,99** |
| MF5 | 0,50 | 50 | 12 | 6,00 | 4,90 | 3 | 59484 | **17,37** | | | | |
| MF5 | 0,75 | 50 | 12 | 6,00 | 4,90 | 3 | 59485 | **16,45** | | | | |
| **M5** | **0,80** | 50 | 16 | 6,00 | 4,90 | 3 | 76400 | **6,02** | 11262 | **6,02** | 26620 | **6,02** |
| MF6 | 0,50 | 50 | 14 | 6,00 | 4,90 | 3 | 59486 | **11,95** | | | | |
| MF6 | 0,75 | 50 | 14 | 6,00 | 4,90 | 3 | 76405 | **9,89** | | | | |
| **M6** | **1,00** | 50 | 19 | 6,00 | 4,90 | 3 | 75383 | **6,02** | 10630 | **6,02** | 10833 | **6,02** |
| MF7 | 0,75 | 50 | 14 | 6,00 | 4,90 | 3 | 46217 | **15,06** | | | | |
| **M7** | **1,00** | 50 | 19 | 6,00 | 4,90 | 3 | 76408 | **7,34** | 66201 | **7,34** | 32812 | **7,34** |
| MF8 | 0,50 | 50 | 19 | 6,00 | 4,90 | 4 | 59487 | **18,52** | | | | |
| MF8 | 0,75 | 50 | 19 | 6,00 | 4,90 | 4 | 59488 | **14,67** | | | | |
| MF8 | 1,00 | 56 | 20 | 6,00 | 4,90 | 4 | 76411 | **9,86** | | | | |
| **M8** | **1,25** | 56 | 22 | 6,00 | 4,90 | 4 | 75449 | **7,34** | 10938 | **7,34** | 26629 | **7,34** |
| MF9 | 1,00 | 63 | 20 | 7,00 | 5,50 | 4 | 34577 | **16,72** | | | | |
| **M9** | **1,25** | 63 | 22 | 7,00 | 5,50 | 4 | 76414 | **11,99** | 66208 | **11,99** | 20543 | **11,99** |
| MF10 | 0,50 | 63 | 20 | 7,00 | 5,50 | 4 | 59489 | **21,36** | | | | |
| MF10 | 0,75 | 63 | 20 | 7,00 | 5,50 | 4 | 59490 | **25,29** | | | | |
| MF10 | 1,00 | 63 | 20 | 7,00 | 5,50 | 4 | 76417 | **10,60** | | | | |
| MF10 | 1,25 | 70 | 24 | 7,00 | 5,50 | 4 | 76418 | **10,75** | | | | |
| **M10** | **1,50** | 70 | 24 | 7,00 | 5,50 | 4 | 74995 | **8,99** | 11148 | **8,99** | 15086 | **8,99** |
| MF11 | 0,75 | 63 | 20 | 8,00 | 6,20 | 4 | 59491 | **51,52** | | | | |
| MF11 | 1,00 | 63 | 20 | 8,00 | 6,20 | 4 | 59492 | **18,54** | | | | |
| MF11 | 1,25 | 63 | 22 | 8,00 | 6,20 | 4 | 59493 | **18,69** | | | | |
| **M11** | **1,50** | 70 | 24 | 8,00 | 6,20 | 4 | 76422 | **15,03** | 25211 | **15,03** | 21282 | **15,03** |
| MF12 | 0,75 | 70 | 22 | 9,00 | 7,00 | 4 | 59494 | **29,67** | | | | |
| MF12 | 1,00 | 70 | 20 | 9,00 | 7,00 | 4 | 22221 | **18,58** | | | | |
| MF12 | 1,25 | 70 | 22 | 9,00 | 7,00 | 4 | 76425 | **18,61** | | | | |
| MF12 | 1,50 | 70 | 22 | 9,00 | 7,00 | 4 | 76426 | **15,86** | | | | |
| **M12** | **1,75** | 75 | 29 | 9,00 | 7,00 | 4 | 74996 | **12,68** | 10834 | **12,68** | 28407 | **12,68** |

**MF N°1 bajo demanda upon request** sur demande

**Cont.**

Ref. 3010

**Cont.**

| | | | | | | | Nº3 Acabado Finishing Finition (M Ref. 3030 / MF Ref. 3020) | | Nº 1 Desbaste M Roughing Ébauche (Ref. 3030) | | Nº 2 Semidesbaste M Semiroughing Semi-ébauche (Ref. 3030) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| M/MF | P | L mm | l mm | d mm | a mm | z | Nº Art. HSS | € | Nº Art. HSS | € | Nº Art. HSS | € |
| MF13 | 0,75 | 70 | 22 | 11,00 | 9,00 | 4 | 59495 | **52,60** | | | | |
| MF13 | 1,00 | 70 | 20 | 11,00 | 9,00 | 4 | 59496 | **29,78** | | | | |
| MF13 | 1,25 | 70 | 22 | 11,00 | 9,00 | 4 | 59497 | **30,01** | | | | |
| MF13 | 1,50 | 70 | 22 | 11,00 | 9,00 | 4 | 59498 | **30,08** | | | | |
| MF14 | 0,75 | 70 | 22 | 11,00 | 9,00 | 4 | 59499 | **51,99** | | | | |
| MF14 | 1,00 | 70 | 20 | 11,00 | 9,00 | 4 | 76433 | **33,15** | | | | |
| MF14 | 1,25 | 70 | 20 | 11,00 | 9,00 | 4 | 45040 | **22,71** | | | | |
| MF14 | 1,50 | 70 | 20 | 11,00 | 9,00 | 4 | 76435 | **17,65** | | | | |
| MF14 | 1,75 | 70 | 30 | 11,00 | 9,00 | 4 | 59500 | **67,70** | | | | |
| **M14** | **2,00** | 80 | 30 | 11,00 | 9,00 | 4 | 76436 | **14,01** | 11772 | **14,01** | 20529 | **14,01** |
| MF15 | 1,00 | 70 | 20 | 12,00 | 9,00 | 4 | 59501 | **40,18** | | | | |
| MF15 | 1,25 | 70 | 22 | 12,00 | 9,00 | 4 | 59503 | **42,99** | | | | |
| MF15 | 1,50 | 70 | 20 | 12,00 | 9,00 | 4 | 76439 | **42,98** | | | | |
| MF16 | 1,00 | 70 | 22 | 12,00 | 9,00 | 4 | 59504 | **38,37** | | | | |
| MF16 | 1,25 | 70 | 22 | 12,00 | 9,00 | 4 | 59505 | **40,38** | | | | |
| MF16 | 1,50 | 70 | 20 | 12,00 | 9,00 | 4 | 76443 | **22,08** | | | | |
| **M16** | **2,00** | 80 | 32 | 12,00 | 9,00 | 4 | 76444 | **19,87** | 17461 | **19,87** | 16312 | **19,87** |
| MF17 | 1,00 | 70 | 22 | 12,00 | 9,00 | 4 | 59506 | **61,80** | | | | |
| MF17 | 1,25 | 70 | 22 | 12,00 | 9,00 | 4 | 59507 | **62,05** | | | | |
| MF17 | 1,50 | 70 | 22 | 12,00 | 9,00 | 4 | 59562 | **29,11** | | | | |
| MF18 | 1,00 | 80 | 22 | 14,00 | 11,00 | 4 | 59508 | **42,63** | | | | |
| MF18 | 1,25 | 80 | 22 | 14,00 | 11,00 | 4 | 59509 | **60,42** | | | | |
| MF18 | 1,50 | 80 | 22 | 14,00 | 11,00 | 4 | 45039 | **29,18** | | | | |
| MF18 | 2,00 | 80 | 22 | 14,00 | 11,00 | 4 | 59510 | **46,32** | | | | |
| **M18** | **2,50** | 95 | 40 | 14,00 | 11,00 | 4 | 76452 | **26,35** | 11916 | **26,35** | 66249 | **26,35** |
| MF19 | 1,25 | 80 | 22 | 14,00 | 11,00 | 4 | 59511 | **88,90** | | | | |
| MF19 | 1,50 | 80 | 22 | 14,00 | 11,00 | 4 | 59512 | **90,45** | | | | |
| MF19 | 2,00 | 80 | 22 | 14,00 | 11,00 | 4 | 59513 | **107,74** | | | | |
| MF20 | 1,00 | 80 | 22 | 16,00 | 12,00 | 4 | 59514 | **56,78** | | | | |
| MF20 | 1,25 | 80 | 22 | 16,00 | 12,00 | 4 | 59515 | **88,98** | | | | |
| MF20 | 1,50 | 80 | 22 | 16,00 | 12,00 | 4 | 76476 | **36,57** | | | | |
| MF20 | 2,00 | 80 | 22 | 16,00 | 12,00 | 4 | 59516 | **48,01** | | | | |
| **M20** | **2,50** | 95 | 40 | 16,00 | 12,00 | 4 | 76478 | **29,66** | 11917 | **29,66** | 17261 | **29,66** |
| MF21 | 1,00 | 80 | 22 | 16,00 | 12,00 | 4 | 59517 | **115,93** | | | | |
| MF21 | 1,25 | 80 | 22 | 16,00 | 12,00 | 4 | 59518 | **114,97** | | | | |
| MF21 | 1,50 | 80 | 22 | 16,00 | 12,00 | 4 | 59519 | **92,43** | | | | |
| MF22 | 1,00 | 80 | 22 | 18,00 | 14,50 | 4 | 59521 | **62,80** | | | | |
| MF22 | 1,25 | 80 | 22 | 18,00 | 14,50 | 4 | 59522 | **90,45** | | | | |
| MF22 | 1,50 | 80 | 22 | 18,00 | 14,50 | 4 | 76484 | **39,88** | | | | |
| MF22 | 2,00 | 80 | 22 | 18,00 | 14,50 | 4 | 76485 | **63,87** | | | | |
| **M22** | **2,50** | 100 | 40 | 18,00 | 14,50 | 4 | 76486 | **39,69** | 65789 | **39,69** | 15241 | **39,69** |
| MF23 | 1,00 | 80 | 22 | 18,00 | 14,50 | 4 | 59523 | **115,83** | | | | |
| MF23 | 1,50 | 80 | 22 | 18,00 | 14,50 | 4 | 59524 | **114,87** | | | | |
| MF24 | 1,25 | 90 | 22 | 18,00 | 14,50 | 4 | 59525 | **116,89** | | | | |
| MF24 | 2,00 | 90 | 22 | 18,00 | 14,50 | 4 | 59526 | **70,81** | | | | |
| **M24** | **3,00** | 110 | 50 | 18,00 | 14,50 | 4 | 76493 | **46,51** | 58475 | **46,51** | 12505 | **46,51** |
| MF25 | 1,00 | 90 | 22 | 18,00 | 14,50 | 4 | 59527 | **101,46** | | | | |
| MF25 | 1,25 | 90 | 22 | 18,00 | 14,50 | 4 | 59528 | **163,80** | | | | |
| MF25 | 2,00 | 90 | 22 | 18,00 | 14,50 | 4 | 59561 | **171,28** | | | | |
| MF26 | 1,00 | 90 | 22 | 18,00 | 14,50 | 4 | 59529 | **89,36** | | | | |
| MF26 | 1,50 | 90 | 22 | 18,00 | 14,50 | 4 | 59530 | **80,11** | | | | |
| MF26 | 2,00 | 90 | 22 | 18,00 | 14,50 | 4 | 59531 | **98,39** | | | | |
| MF27 | 1,00 | 90 | 22 | 20,00 | 16,00 | 4 | 59532 | **99,55** | | | | |
| MF27 | 1,50 | 90 | 22 | 20,00 | 16,00 | 4 | 59533 | **88,79** | | | | |
| **M27** | **3,00** | 110 | 50 | 20,00 | 16,00 | 4 | 76505 | **59,88** | 10836 | **59,88** | 66294 | **59,88** |
| MF28 | 1,00 | 90 | 22 | 20,00 | 16,00 | 4 | 59534 | **165,30** | | | | |

**Cont.**

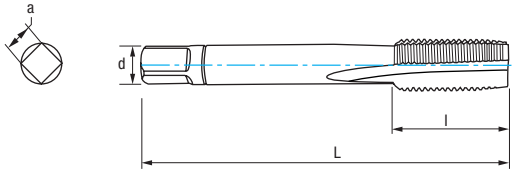
Ref. 3010

**Cont.**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | **Nº3 Acabado Finishing** Finition **(M** Ref. 3030 / MF Ref. 3020) | | **Nº 1 Desbaste M Roughing** Ébauche **(Ref. 3030)** | | **Nº 2 Semidesbaste M Semiroughing** Semi-ébauche **(Ref. 3030)** | |
| | **M/MF** | **P** | **L mm** | **l mm** | **d mm** | **a mm** | **Z** | | **Nº Art. HSS** | **€** | **Nº Art. HSS** | **€** | **Nº Art. HSS** | **€** |
| | MF28 | 1,50 | 90 | 22 | 20,00 | 16,00 | 4 | | 59535 | **89,00** | | | | |
| | MF30 | 1,00 | 90 | 22 | 22,00 | 18,00 | 4 | | 16388 | **124,16** | | | | |
| | MF30 | 1,50 | 90 | 22 | 22,00 | 18,00 | 4 | | 59536 | **92,32** | | | | |
| | **M30** | **3,50** | 125 | 50 | 22,00 | 18,00 | 4 | | 76512 | **76,67** | 26582 | **76,67** | 13046 | **76,67** |
| New! | M32 | 1,50 | 90 | 22 | 22,00 | 18,00 | 4 | | 25967 | **128,81** | | | | |
| | MF33 | 1,50 | 100 | 25 | 25,00 | 20,00 | 4 | | 59537 | **125,24** | | | | |
| | MF33 | 2,00 | 100 | 25 | 25,00 | 20,00 | 4 | | 59538 | **148,91** | | | | |
| | **M33** | **3,50** | 125 | 56 | 25,00 | 20,00 | 4 | | 76519 | **96,71** | 66307 | **96,71** | 66308 | **96,71** |
| | MF34 | 1,50 | 100 | 25 | 28,00 | 22,00 | 4 | | 59539 | **135,53** | | | | |
| | MF35 | 1,50 | 100 | 25 | 28,00 | 22,00 | 4 | | 59540 | **150,30** | | | | |
| | MF36 | 1,50 | 100 | 25 | 28,00 | 22,00 | 4 | | 59541 | **145,16** | | | | |
| | MF36 | 3,00 | 125 | 40 | 28,00 | 22,00 | 4 | | 59542 | **253,44** | | | | |
| | **M36** | **4,00** | 150 | 63 | 28,00 | 22,00 | 4 | | 76525 | **123,39** | 66317 | **123,39** | 38036 | **123,39** |
| | MF38 | 1,50 | 100 | 25 | 28,00 | 22,00 | 4 | | 59543 | **163,31** | | | | |
| | MF38 | 2,00 | 125 | 40 | 28,00 | 22,00 | 4 | | 59544 | **232,73** | | | | |
| | MF39 | 1,50 | 110 | 25 | 32,00 | 24,00 | 4 | | 59545 | **219,02** | | | | |
| | MF39 | 2,00 | 125 | 40 | 32,00 | 24,00 | 4 | | 59546 | **217,21** | | | | |
| | MF39 | 3,00 | 125 | 40 | 28,00 | 22,00 | 4 | | 59547 | **214,90** | | | | |
| | **M39** | **4,00** | 150 | 63 | 32,00 | 24,00 | 4 | | 76531 | **138,06** | 66328 | **138,06** | 66329 | **138,06** |
| | MF40 | 1,50 | 110 | 25 | 32,00 | 24,00 | 4 | | 59548 | **193,38** | | | | |
| | MF40 | 2,00 | 125 | 40 | 32,00 | 24,00 | 4 | | 59549 | **220,92** | | | | |
| | MF40 | 3,00 | 125 | 40 | 32,00 | 24,00 | 4 | | 59550 | **222,54** | | | | |
| | MF42 | 1,50 | 110 | 25 | 32,00 | 24,00 | 4 | | 14781 | **255,85** | | | | |
| | MF42 | 2,00 | 125 | 40 | 32,00 | 24,00 | 4 | | 59551 | **256,97** | | | | |
| | MF42 | 3,00 | 125 | 40 | 32,00 | 24,00 | 4 | | 59552 | **252,77** | | | | |
| | **M42** | **4,50** | 150 | 63 | 32,00 | 24,00 | 4 | | 76538 | **172,73** | 66342 | **172,73** | 61071 | **172,73** |
| | MF45 | 1,50 | 110 | 25 | 36,00 | 29,00 | 6 | | 16389 | **289,06** | | | | |
| | MF45 | 2,00 | 125 | 40 | 36,00 | 29,00 | 6 | | 59553 | **300,92** | | | | |
| | MF45 | 3,00 | 125 | 40 | 36,00 | 29,00 | 6 | | 59554 | **305,93** | | | | |
| | **M45** | **4,50** | 160 | 70 | 36,00 | 29,00 | 6 | | 76542 | **199,42** | 32663 | **199,42** | 32664 | **199,42** |
| | MF48 | 1,50 | 140 | 40 | 36,00 | 29,00 | 6 | | 16390 | **325,78** | | | | |
| | MF48 | 2,00 | 140 | 40 | 36,00 | 29,00 | 6 | | 59555 | **402,52** | | | | |
| | MF48 | 3,00 | 140 | 40 | 36,00 | 29,00 | 6 | | 59556 | **364,32** | | | | |
| | **M48** | **5,00** | 180 | 75 | 36,00 | 29,00 | 6 | | 76546 | **240,09** | 66355 | **240,09** | 66356 | **240,09** |
| | MF50 | 1,50 | 140 | 40 | 36,00 | 29,00 | 6 | | 59557 | **291,89** | | | | |
| | MF52 | 1,50 | 140 | 40 | 40,00 | 32,00 | 6 | | 59558 | **312,23** | | | | |
| | MF52 | 2,00 | 140 | 40 | 40,00 | 32,00 | 6 | | 59559 | **452,91** | | | | |
| | MF52 | 3,00 | 140 | 40 | 40,00 | 32,00 | 6 | | 59560 | **413,61** | | | | |
| | **M52** | **5,00** | 180 | 75 | 40,00 | 32,00 | 6 | | 76551 | **291,45** | 66367 | **291,45** | 66368 | **291,45** |

# Ref. 3023

## MACHO MANO PERFIL ROSCA COMPLETA
Whole Thread Profile Hand Tap
Taraud à main profil filetage complet

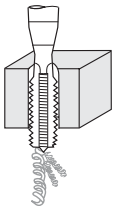



HSS | DIN 352 | Tol. 6H | α 10° ± 2 | 4-6h | 60°

| Grupo Group-Groupe | Subgrup. |
|---|---|
| P | P.1 |

| Grupo Group-Groupe |
|---|
| K |

| Grupo Group-Groupe | Subgrup. |
|---|---|
| N | N.1 - N.3<br>N.4 - N.5 |



≤ 2D

| M | P | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **M3** | **0,50** | 40 | 11 | 3,50 | 2,70 | 3 | 46263 | **8,50** |
| **M4** | **0,70** | 45 | 13 | 4,50 | 3,40 | 3 | 46264 | **8,50** |
| **M5** | **0,80** | 50 | 16 | 6,00 | 4,90 | 3 | 46265 | **9,01** |
| **M6** | **1,00** | 50 | 19 | 6,00 | 4,90 | 3 | 46266 | **9,01** |
| **M8** | **1,25** | 56 | 22 | 6,00 | 4,90 | 4 | 46267 | **11,00** |
| **M10** | **1,50** | 70 | 24 | 7,00 | 5,50 | 4 | 46268 | **13,51** |
| **M12** | **1,75** | 75 | 29 | 9,00 | 7,00 | 4 | 46269 | **19,03** |
| **M16** | **2,00** | 80 | 32 | 12,00 | 9,00 | 4 | 46270 | **29,81** |
| **M20** | **2,50** | 95 | 40 | 16,00 | 12,00 | 4 | 46271 | **44,50** |

**Macho único que finaliza la rosca completa en agujeros pasantes. Espesor material <1,5 mm. Viruta media/larga.**

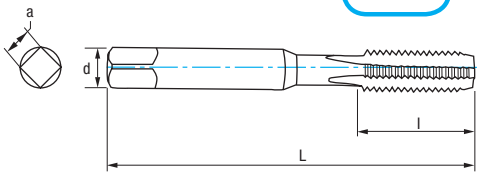
**Single tap for whole thread finishing in through holes. Material thickness <1,5 mm. Medium/long chip removal.**

Guidage et filetage complet sur trous débouchants. Épaisseur materiel <1,5 mm. Copeaux moyens/longs.

# Ref. 3039

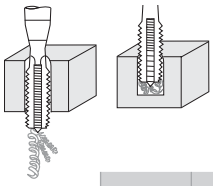
## MACHO ÚNICO MANO MÉTRICA / MÉTRICA FINA NORMA ISO
ISO Standard Metric / Metric Fine Hand Single Tap
Taraud à main unique métrique / métrique pas fin norme ISO

New!




HSS | ISO 529 | Tol. 6H | α 10° ± 2 | 60°

| Grupo Group-Groupe | Subgrup. | Grupo Group-Groupe | Grupo Group-Groupe | Subgrup. |
|---|---|---|---|---|
| P | P.1 | K | N | N.1 - N.3 N.4 - N.5 |



≤ 1,5D

**N°3 Acabado Finishing** Finition

A 6-8h | B 3,5-5h | C 2-3h

| M | P | L mm | l mm | d mm | a mm | z | N° Art. HSS | € | N° Art. HSS | € | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M1** | **0,25** | 38,50 | 5,50 | 2,50 | 2,00 | 3 | 29121 | **21,31** | 29122 | **21,31** | 29123 | **21,31** |
| **M1,2** | **0,25** | 38,50 | 5,50 | 2,50 | 2,00 | 3 | 29124 | **21,31** | 29125 | **21,31** | 29126 | **21,31** |
| **M1,4** | **0,30** | 40,00 | 7,00 | 2,50 | 2,00 | 3 | 29127 | **21,31** | 29128 | **21,31** | 29129 | **21,31** |
| **M1,6** | **0,35** | 41,00 | 8,00 | 2,50 | 2,00 | 3 | 29130 | **19,45** | 29131 | **19,45** | 29132 | **19,45** |
| **M1,7** | **0,35** | 41,00 | 8,00 | 2,50 | 2,00 | 3 | 29133 | **12,28** | 29134 | **12,28** | 29159 | **12,28** |
| **M1,8** | **0,35** | 41,00 | 8,00 | 2,50 | 2,00 | 3 | 29160 | **18,25** | 29162 | **18,25** | 29164 | **18,25** |
| **M2** | **0,40** | 41,00 | 8,00 | 2,50 | 2,00 | 3 | 29171 | **9,68** | 29172 | **9,68** | 29175 | **9,68** |
| M2 | 0,45 | 41,00 | 8,00 | 2,50 | 2,00 | 3 | 29176 | **9,68** | 29177 | **9,68** | 29193 | **9,68** |
| **M2,2** | **0,45** | 44,50 | 9,50 | 2,80 | 2,24 | 3 | 29195 | **10,09** | 29196 | **10,09** | 29197 | **10,09** |
| **M2,3** | **0,45** | 44,50 | 9,50 | 2,80 | 2,24 | 3 | 29199 | **10,09** | 29211 | **10,09** | 29212 | **10,09** |
| **M2,5** | **0,45** | 44,50 | 9,50 | 2,80 | 2,24 | 3 | 29214 | **9,68** | 29216 | **9,68** | 29217 | **9,68** |
| **M2,6** | **0,45** | 44,50 | 9,50 | 2,80 | 2,24 | 3 | 29218 | **8,91** | 29234 | **8,91** | 29277 | **8,91** |
| MF3 | 0,35 | 48,00 | 11,00 | 3,15 | 2,50 | 3 | 45629 | **15,95** | 45644 | **15,95** | 45647 | **15,95** |
| **M3** | **0,50** | 48,00 | 11,00 | 3,15 | 2,50 | 3 | 29475 | **5,50** | 29477 | **5,50** | 29484 | **5,50** |
| M3 | 0,60 | 48,00 | 11,00 | 3,15 | 2,50 | 3 | 29494 | **10,55** | 29633 | **10,55** | 29846 | **10,55** |
| MF3,5 | 0,35 | 48,00 | 11,00 | 3,15 | 2,50 | 3 | | | | | 45650 | **15,95** |
| **M3,5** | **0,60** | 50,00 | 13,00 | 3,55 | 2,80 | 3 | 29861 | **6,50** | 29862 | **6,50** | 29865 | **6,50** |
| MF4 | 0,50 | 53,00 | 13,00 | 4,00 | 3,15 | 3 | 45659 | **15,95** | 45662 | **15,95** | 45665 | **15,95** |
| **M4** | **0,70** | 53,00 | 13,00 | 4,00 | 3,15 | 3 | 29866 | **5,50** | 29867 | **5,50** | 29872 | **5,50** |
| M4 | 0,75 | 53,00 | 13,00 | 4,00 | 3,15 | 3 | 29879 | **9,89** | 29886 | **9,89** | 29887 | **9,89** |
| **M4,5** | **0,75** | 53,00 | 13,00 | 4,00 | 3,15 | 3 | 29889 | **9,70** | 29890 | **9,70** | 29892 | **9,70** |
| MF5 | 0,50 | 58,00 | 16,00 | 5,00 | 4,00 | 3 | 45668 | **16,86** | 45671 | **16,86** | 45698 | **16,86** |
| MF5 | 0,75 | 58,00 | 16,00 | 5,00 | 4,00 | 3 | 45701 | **15,97** | 45705 | **15,97** | 45744 | **15,97** |
| **M5** | **0,80** | 58,00 | 16,00 | 5,00 | 4,00 | 3 | 29943 | **5,84** | 29948 | **5,84** | 29956 | **5,84** |
| M5 | 0,90 | 58,00 | 16,00 | 5,00 | 4,00 | 3 | 29957 | **11,45** | 29966 | **11,45** | 29973 | **11,45** |
| **M5,5** | **0,90** | 62,00 | 12,00 | 5,60 | 4,50 | 3 | 29982 | **39,47** | 29983 | **39,47** | 29984 | **39,47** |
| MF6 | 0,50 | 66,00 | 19,00 | 6,30 | 5,00 | 3 | 45819 | **11,60** | 45822 | **11,60** | 45845 | **11,60** |
| MF6 | 0,75 | 66,00 | 19,00 | 6,30 | 5,00 | 3 | 45854 | **9,60** | 45856 | **9,60** | 45859 | **9,60** |
| **M6** | **1,00** | 66,00 | 19,00 | 6,30 | 5,00 | 3 | 29986 | **5,84** | 29987 | **5,84** | 30006 | **5,84** |
| MF7 | 0,75 | 66,00 | 19,00 | 7,10 | 5,60 | 3 | 45869 | **14,62** | 45875 | **14,62** | 45878 | **14,62** |
| **M7** | **1,00** | 66,00 | 19,00 | 7,10 | 5,60 | 3 | 30007 | **7,13** | 30009 | **7,13** | 30010 | **7,13** |
| MF8 | 0,50 | 66,00 | 19,00 | 8,00 | 6,30 | 3 | 45884 | **17,98** | 45890 | **17,98** | 45893 | **17,98** |
| MF8 | 0,75 | 66,00 | 19,00 | 8,00 | 6,30 | 3 | 45902 | **14,24** | 45904 | **14,24** | 45917 | **14,24** |
| MF8 | 1,00 | 66,00 | 19,00 | 8,00 | 6,30 | 3 | 45931 | **9,57** | 45934 | **9,57** | 45935 | **9,57** |
| **M8** | **1,25** | 66,00 | 19,00 | 8,00 | 6,30 | 3 | 30011 | **7,13** | 30013 | **7,13** | 30016 | **7,13** |
| MF9 | 0,75 | 66,00 | 19,00 | 9,00 | 7,10 | 3 | | | | | 45936 | **16,23** |
| MF9 | 1,00 | 72,00 | 22,00 | 9,00 | 7,10 | 3 | 45938 | **16,23** | 45939 | **16,23** | 45940 | **16,23** |
| **M9** | **1,25** | 72,00 | 22,00 | 9,00 | 7,10 | 3 | 30017 | **11,64** | 30018 | **11,64** | 30020 | **11,64** |
| MF10 | 0,50 | 73,00 | 20,00 | 10,00 | 8,00 | 3 | | | | | 45942 | **20,74** |
| MF10 | 0,75 | 73,00 | 20,00 | 10,00 | 8,00 | 3 | 46031 | **20,25** | 46034 | **20,25** | 46037 | **20,25** |
| MF10 | 1,00 | 80,00 | 24,00 | 10,00 | 8,00 | 3 | 46040 | **10,29** | 46043 | **10,29** | 46046 | **10,29** |
| MF10 | 1,25 | 80,00 | 24,00 | 10,00 | 8,00 | 3 | 46049 | **10,14** | 46052 | **10,14** | 46055 | **10,14** |
| **M10** | **1,50** | 80,00 | 24,00 | 10,00 | 8,00 | 3 | 30021 | **8,73** | 30063 | **8,73** | 30064 | **8,73** |
| MF11 | 0,75 | 80,00 | 22,00 | 8,00 | 6,30 | 4 | 46058 | **50,02** | 46061 | **50,02** | 46067 | **50,02** |
| MF11 | 1,00 | 80,00 | 22,00 | 8,00 | 6,30 | 4 | 46070 | **18,00** | 46075 | **18,00** | 46078 | **18,00** |
| MF11 | 1,25 | 80,00 | 22,00 | 8,00 | 6,30 | 4 | | | | | 46089 | **18,15** |

# Ref. 3039

**Cont.**

| M | P | L mm | l mm | d mm | a mm | Z | A 6-8h N° Art. HSS | A 6-8h € | B 3,5-5h N° Art. HSS | B 3,5-5h € | C 2-3h N° Art. HSS | C 2-3h € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **M11** | **1,50** | 80,00 | 22,00 | 8,00 | 6,30 | 4 | 30065 | **14,59** | 30066 | **14,59** | 30067 | **14,59** |
| MF12 | 0,75 | 80,00 | 22,00 | 9,00 | 7,10 | 4 | | | | | 46091 | **28,81** |
| MF12 | 1,00 | 80,00 | 22,00 | 9,00 | 7,10 | 4 | 46093 | **18,04** | 46095 | **18,04** | 46098 | **18,04** |
| MF12 | 1,25 | 89,00 | 29,00 | 9,00 | 7,10 | 4 | 46101 | **18,07** | 46103 | **18,07** | 46104 | **18,07** |
| MF12 | 1,50 | 89,00 | 29,00 | 9,00 | 7,10 | 4 | 46105 | **15,40** | 46155 | **15,40** | 46156 | **15,40** |
| **M12** | **1,75** | 89,00 | 29,00 | 9,00 | 7,10 | 4 | 30068 | **12,31** | 30069 | **12,31** | 30070 | **12,31** |
| MF13 | 1,50 | 89,00 | 29,00 | 9,00 | 7,10 | 4 | | | | | 46158 | **29,20** |
| MF14 | 1,00 | 87,00 | 22,00 | 11,20 | 9,00 | 4 | 46159 | **32,18** | 46161 | **32,18** | 46162 | **32,18** |
| MF14 | 1,25 | 95,00 | 30,00 | 11,20 | 9,00 | 4 | 46164 | **22,05** | 46165 | **22,05** | 46167 | **22,05** |
| MF14 | 1,50 | 95,00 | 30,00 | 11,20 | 9,00 | 4 | 46168 | **17,14** | 46169 | **17,14** | 46170 | **17,14** |
| **M14** | **2,00** | 95,00 | 30,00 | 11,20 | 9,00 | 4 | 30071 | **13,60** | 30072 | **13,60** | 30073 | **13,60** |
| MF15 | 1,50 | 95,00 | 30,00 | 11,20 | 9,00 | 4 | | | 46171 | **41,73** | 46173 | **41,73** |
| MF16 | 1,00 | 92,00 | 22,00 | 12,50 | 10,00 | 4 | 46176 | **37,25** | 46177 | **37,25** | 46178 | **37,25** |
| MF16 | 1,25 | 102,00 | 32,00 | 12,50 | 10,00 | 4 | | | | | 46179 | **39,20** |
| MF16 | 1,50 | 102,00 | 32,00 | 12,50 | 10,00 | 4 | 46180 | **21,44** | 46181 | **21,44** | 46182 | **21,44** |
| **M16** | **2,00** | 102,00 | 32,00 | 12,50 | 10,00 | 4 | 30074 | **19,29** | 30075 | **19,29** | 30076 | **19,29** |
| MF18 | 1,00 | 97,00 | 22,00 | 14,00 | 11,20 | 4 | 46183 | **41,39** | 46184 | **41,39** | 46315 | **41,39** |
| MF18 | 1,50 | 112,00 | 37,00 | 14,00 | 11,20 | 4 | 46327 | **28,33** | 46348 | **28,33** | 46525 | **28,33** |
| MF18 | 2,00 | 112,00 | 37,00 | 14,00 | 11,20 | 4 | 46531 | **44,97** | 46540 | **44,97** | 46631 | **44,97** |
| **M18** | **2,50** | 112,00 | 37,00 | 14,00 | 11,20 | 4 | 30077 | **25,58** | 30078 | **25,58** | 30080 | **25,58** |
| MF20 | 1,00 | 102,00 | 22,00 | 14,00 | 11,20 | 4 | 46901 | **55,13** | 46823 | **55,13** | 46898 | **55,13** |
| MF20 | 1,50 | 112,00 | 37,00 | 14,00 | 11,20 | 4 | 46919 | **35,50** | 46925 | **35,50** | 46931 | **35,50** |
| MF20 | 2,00 | 112,00 | 37,00 | 14,00 | 11,20 | 4 | 46940 | **46,61** | 46967 | **46,61** | 46976 | **46,61** |
| **M20** | **2,50** | 112,00 | 37,00 | 14,00 | 11,20 | 4 | 30082 | **28,80** | 30083 | **28,80** | 30085 | **28,80** |
| MF22 | 1,00 | 118,00 | 38,00 | 16,00 | 12,50 | 4 | | | 46979 | **60,97** | 46982 | **60,97** |
| MF22 | 1,50 | 118,00 | 38,00 | 16,00 | 12,50 | 4 | 46985 | **38,72** | 46988 | **38,72** | 46994 | **38,72** |
| MF22 | 2,00 | 118,00 | 38,00 | 16,00 | 12,50 | 4 | 46997 | **62,01** | 47000 | **62,01** | 47006 | **62,01** |
| **M22** | **2,50** | 118,00 | 38,00 | 16,00 | 12,50 | 4 | 30086 | **38,53** | 30087 | **38,53** | 30088 | **38,53** |
| MF24 | 1,00 | 130,00 | 45,00 | 18,00 | 14,00 | 4 | | | 47012 | **71,78** | 47015 | **71,78** |
| MF24 | 1,50 | 130,00 | 45,00 | 18,00 | 14,00 | 4 | 47018 | **50,91** | 47021 | **50,91** | 47024 | **50,91** |
| MF24 | 2,00 | 130,00 | 45,00 | 18,00 | 14,00 | 4 | 47027 | **68,75** | 47033 | **68,75** | 47036 | **68,75** |
| **M24** | **3,00** | 130,00 | 45,00 | 18,00 | 14,00 | 4 | 30089 | **45,16** | 30090 | **45,16** | 30091 | **45,16** |
| MF25 | 1,50 | 130,00 | 45,00 | 18,00 | 14,00 | 4 | 47198 | **100,49** | 47273 | **100,49** | 47276 | **100,49** |
| MF26 | 1,50 | 120,00 | 35,00 | 18,00 | 14,00 | 4 | | | 47279 | **77,78** | 47282 | **77,78** |
| MF27 | 1,50 | 127,00 | 37,00 | 20,00 | 16,00 | 4 | | | 47288 | **86,20** | 47300 | **86,20** |
| MF27 | 2,00 | 127,00 | 37,00 | 20,00 | 16,00 | 4 | | | | | 47435 | **118,80** |
| **M27** | **3,00** | 127,00 | 37,00 | 20,00 | 16,00 | 4 | 30092 | **58,14** | 30093 | **58,14** | 30111 | **58,14** |
| MF28 | 1,50 | 127,00 | 37,00 | 20,00 | 16,00 | 4 | | | 47444 | **86,41** | 47453 | **86,41** |
| MF30 | 1,50 | 127,00 | 37,00 | 20,00 | 16,00 | 4 | | | 47960 | **89,63** | 47963 | **89,63** |
| MF30 | 2,00 | 127,00 | 37,00 | 20,00 | 16,00 | 4 | | | 47966 | **128,81** | 47969 | **128,81** |
| **M30** | **3,50** | 127,00 | 37,00 | 20,00 | 16,00 | 4 | 30112 | **74,44** | 30113 | **74,44** | 30115 | **74,44** |
| MF32 | 1,50 | 137,00 | 37,00 | 22,40 | 18,00 | 4 | 48092 | **129,01** | 48095 | **129,01** | 48098 | **129,01** |
| MF33 | 2,00 | 137,00 | 37,00 | 22,40 | 18,00 | 4 | | | 48104 | **144,57** | 48107 | **144,57** |
| **M33** | **3,50** | 137,00 | 37,00 | 22,40 | 18,00 | 4 | 30118 | **93,89** | 30120 | **93,89** | 30125 | **93,89** |
| MF35 | 1,50 | 144,00 | 39,00 | 25,00 | 20,00 | 4 | | | 48110 | **145,92** | 48113 | **145,92** |
| MF36 | 1,50 | 144,00 | 39,00 | 25,00 | 20,00 | 4 | | | | | 48140 | **140,93** |
| MF36 | 2,00 | 144,00 | 39,00 | 25,00 | 20,00 | 4 | | | 48149 | **222,75** | 48152 | **222,75** |
| MF36 | 3,00 | 144,00 | 39,00 | 25,00 | 20,00 | 4 | | | 48161 | **246,06** | 48164 | **246,06** |
| **M36** | **4,00** | 144,00 | 39,00 | 25,00 | 20,00 | 4 | 30126 | **119,80** | 30138 | **119,80** | 30145 | **119,80** |
| MF39 | 3,00 | 170,00 | 60,00 | 28,00 | 22,40 | 4 | | | 48176 | **208,64** | 48188 | **208,64** |
| **M39** | **4,00** | 170,00 | 60,00 | 28,00 | 22,40 | 4 | 30146 | **134,04** | 30147 | **134,04** | 30148 | **134,04** |
| MF40 | 1,50 | 149,00 | 39,00 | 28,00 | 22,40 | 4 | | | 48191 | **187,75** | 48194 | **187,75** |
| MF42 | 1,50 | 149,00 | 39,00 | 28,00 | 22,40 | 4 | | | 48197 | **248,40** | 48200 | **248,40** |
| MF42 | 3,00 | 149,00 | 39,00 | 28,00 | 22,40 | 4 | | | | | 48203 | **245,41** |
| **M42** | **4,50** | 149,00 | 39,00 | 28,00 | 22,40 | 4 | 30149 | **167,70** | 30150 | **167,70** | 30151 | **167,70** |
| MF45 | 1,50 | 165,00 | 45,00 | 31,50 | 25,00 | 4 | | | 48206 | **280,64** | 48209 | **280,64** |
| **M45** | **4,50** | 165,00 | 45,00 | 31,50 | 25,00 | 4 | 30152 | **193,61** | 30430 | **193,61** | 30459 | **193,61** |
| MF48 | 1,50 | 165,00 | 45,00 | 31,50 | 25,00 | 4 | | | | | 48212 | **316,29** |
| MF48 | 2,00 | 165,00 | 45,00 | 31,50 | 25,00 | 4 | | | | | 48218 | **390,80** |
| MF48 | 3,00 | 165,00 | 45,00 | 31,50 | 25,00 | 4 | | | | | 48224 | **353,71** |
| **M48** | **5,00** | 187,00 | 67,00 | 31,50 | 25,00 | 4 | 30487 | **233,10** | 30493 | **233,10** | 30494 | **233,10** |
| MF50 | 1,50 | 165,00 | 45,00 | 31,50 | 25,00 | 4 | | | 48284 | **283,39** | 48287 | **283,39** |
| **M52** | **5,00** | 200,00 | 70,00 | 35,50 | 28,00 | 4 | | | | | 30495 | **282,96** |
| **M56** | **5,50** | 200,00 | 70,00 | 35,50 | 28,00 | 4 | | | | | 30500 | **436,73** |

# Set 3039

## MACHO ÚNICO MANO MÉTRICA / MÉTRICA FINA NORMA ISO
ISO Standard Metric / Metric Fine Hand Single Tap
Taraud à main unique métrique / métrique pas fin norme ISO

New!

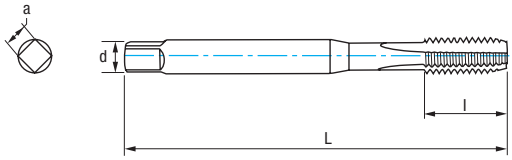
### Ref. 3039 + 1015 Zirkonio

**14 Pcs**

| Cont. | | Nº Art. Zirkonio | € |
|---|---|---|---|
| **Machos / Taps /** Tarauds<br>**ISO 529: M3-M4-M5-M6-M8-M10-M12**<br><br>**Brocas / Drill Bits /** Forets<br>**HSS: 2,5-3,3-4,2-5,0-6,8-8,5-10,2** | C 2-3h | 26020 | **76,02** |

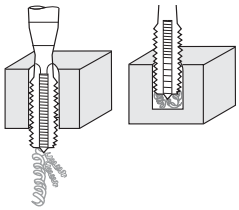
# Ref. 3144

## MACHO RECTO MÁQUINA UNC
UNC Machine Straight Tap
Taraud droit machine UNC




PMX | HARD | DIN 371 | C 2-3h | Tol. 2B | α 10 -14° | 60°

**Estándar americano para rosca gruesa**
**U.S standard for coarse thread**
Norme américaine pour le filetage grossier



< 2D

| Material | | Vc (m/min) * |
|---|---|---|
| Grupo | Sub. | HARD |
| P | P.2 | 6-8 |
| | P.5 | 6-10 |
| M | | 8-14 |
| N | N.1 | 10-15 |
| | N.2 | 12-20 |

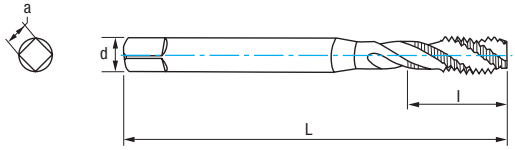
*** Posible Uso en Seco: Vc -50 %**
*** Possible Dry-Use: Vc -50%**
* Emploi possible à sec: Vc -50 %

**Avance f = P (Paso - Pitch - Pas)**
**Vf (mm/min.) = r.p.m. x f**
**r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$**

| UNC | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| **UNC Nº10** | **24** | 70 | 13 | 6,00 | 4,90 | 3 | 71378 | **39,52** |
| **UNC 1/4** | **20** | 80 | 15 | 7,00 | 5,50 | 3 | 71372 | **43,08** |
| **UNC 5/16** | **18** | 90 | 18 | 8,00 | 6,20 | 3 | 71376 | **49,13** |
| **UNC 3/8** | **16** | 90 | 20 | 9,00 | 7,00 | 3 | 71374 | **58,74** |

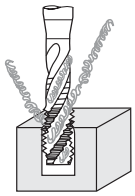
# Ref. 3104

## MACHO HELICOIDAL MÁQUINA UNC
UNC Machine Spiral Tap
Taraud hélicoïdal machine UNC




PMX | HARD | DIN 371 | C 2-3h | Tol. 2B | 35° | α 10 -14° | 60°

**Estándar americano para rosca gruesa**
**U.S standard for coarse thread**
Norme américaine pour le filetage grossier



≤ 2D

| Material | | Vc (m/min) * |
|---|---|---|
| Grupo | Sub. | HARD |
| P | P.2 | 6-8 |
| | P.5 | 6-10 |
| M | | 8-14 |
| N | N.1 | 10-15 |
| | N.2 | 12-20 |

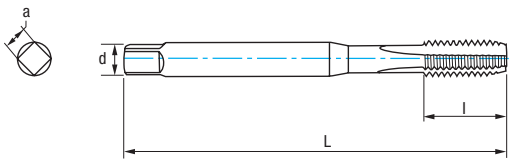
*** Posible Uso en Seco: Vc -50 %**
*** Possible Dry-Use: Vc -50%**
* Emploi possible à sec: Vc -50 %

**Avance f = P (Paso - Pitch - Pas)**
**Vf (mm/min.) = r.p.m. x f**
**r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$**

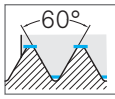
| UNC | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| **UNC Nº10** | **24** | 70 | 8 | 6,00 | 4,90 | 3 | 69500 | **43,90** |
| **UNC 1/4** | **20** | 80 | 10 | 7,00 | 5,50 | 3 | 69502 | **45,35** |
| **UNC 5/16** | **18** | 90 | 13 | 8,00 | 6,20 | 3 | 69503 | **54,59** |
| **UNC 3/8** | **16** | 90 | 15 | 9,00 | 7,00 | 3 | 69505 | **65,28** |

# Ref. 3134

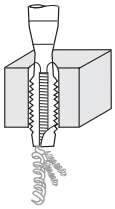
## MACHO RECTO MÁQUINA UNC MANGO REFORZADO
Reinforced Shank UNC Machine Straight Tap
Taraud droit machine UNC queue renforcée




HSSE 5%Co | DIN 371 | B 3,5-5h | Tol. 2B | GUN | α 10 -14°




**Estándar americano para rosca gruesa**
**U.S standard for coarse thread**
Norme américaine pour le filetage grossier



≤ 2D

| UNC | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| UNC N°5 | 40 | 56 | 9 | 3,50 | 2,70 | 3 | 75627 | 27,52 |
| UNC N°6 | 32 | 56 | 11 | 4,00 | 3,00 | 3 | 75628 | 26,23 |
| UNC N°8 | 32 | 63 | 12 | 4,50 | 3,40 | 3 | 75629 | 26,23 |
| UNC N°10 | 24 | 70 | 13 | 6,00 | 4,90 | 3 | 75630 | 27,52 |
| UNC N°12 | 24 | 80 | 15 | 6,00 | 4,90 | 3 | 75631 | 28,88 |
| UNC 1/4 | 20 | 80 | 15 | 7,00 | 5,50 | 3 | 75527 | 22,24 |
| UNC 5/16 | 18 | 90 | 18 | 8,00 | 6,20 | 3 | 75531 | 25,92 |
| UNC 3/8 | 16 | 90 | 20 | 9,00 | 7,00 | 3 | 75529 | 27,97 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

$$P = \frac{25{,}40}{\text{Hilos Threads - Filets}}$$

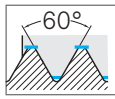
Vf (mm/min.) = r.p.m. x f

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

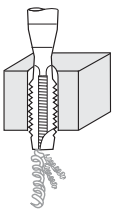
# Ref. 3234

## MACHO RECTO MÁQUINA UNC
UNC Machine Straight Tap
Taraud droit machine UNC

HSSE 5%Co | DIN 376 | B 3,5-5h | Tol. 2B | GUN | α 10 -14°




**Estándar americano para rosca gruesa**
**U.S standard for coarse thread**
Norme américaine pour le filetage grossier



≤ 2D

| UNC | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| UNC 7/16 | 14 | 100 | 20 | 8,00 | 6,20 | 3 | 70521 | 39,70 |
| UNC 1/2 | 13 | 110 | 23 | 9,00 | 7,00 | 3 | 70512 | 43,52 |
| UNC 9/16 | 12 | 110 | 25 | 11,00 | 9,00 | 3 | 70522 | 59,26 |
| UNC 5/8 | 11 | 110 | 25 | 12,00 | 9,00 | 3 | 70516 | 57,72 |
| UNC 3/4 | 10 | 125 | 30 | 14,00 | 11,00 | 3 | 70513 | 76,34 |
| UNC 7/8 | 9 | 140 | 30 | 18,00 | 14,50 | 3 | 70519 | 100,38 |
| UNC 1" | 8 | 160 | 36 | 18,00 | 14,50 | 3 | 70524 | 131,86 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

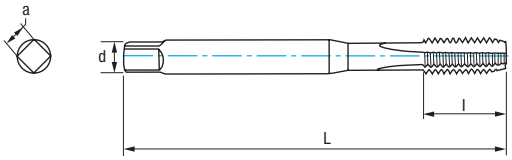
$$P = \frac{25{,}40}{\text{Hilos Threads - Filets}}$$

Vf (mm/min.) = r.p.m. x f

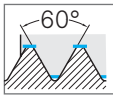
$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

# Ref. 3114

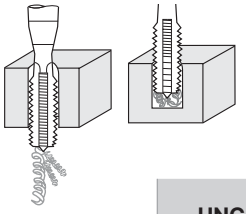
## MACHO RECTO MÁQUINA UNC MANGO REFORZADO
Reinforced Shank UNC Machine Straight Tap
Taraud droit machine UNC queue renforcée




HSSE 5%Co | DIN 371 | C 2-3h | Tol. 2B | α 10° ± 2




**Estándar americano para rosca gruesa**
**U.S standard for coarse thread**
Norme américaine pour le filetage grossier



≤ 1,5D

| UNC | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| UNC N°5 | 40 | 56 | 11 | 3,50 | 2,70 | 3 | 75615 | 22,96 |
| UNC N°6 | 32 | 56 | 13 | 4,00 | 3,00 | 3 | 75616 | 21,83 |
| UNC N°8 | 32 | 63 | 13 | 4,50 | 3,40 | 3 | 75617 | 21,83 |
| UNC N°10 | 24 | 70 | 16 | 6,00 | 4,90 | 3 | 75618 | 22,96 |
| UNC N°12 | 24 | 80 | 17 | 6,00 | 4,90 | 3 | 75619 | 24,08 |
| UNC 1/4 | 20 | 80 | 19 | 7,00 | 5,50 | 3 | 75507 | 20,37 |
| UNC 5/16 | 18 | 90 | 22 | 8,00 | 6,20 | 3 | 16693 | 23,46 |
| UNC 3/8 | 16 | 90 | 22 | 9,00 | 7,00 | 3 | 75509 | 26,83 |

| Material Grupo | Material Sub. | Vc (m/min) 5%Co |
|---|---|---|
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

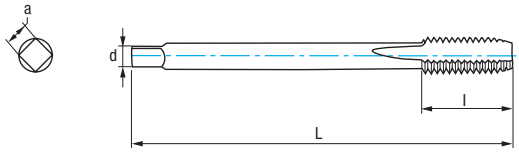
$$P = \frac{25{,}40}{\text{Hilos Threads - Filets}}$$

Vf (mm/min.) = r.p.m. x f

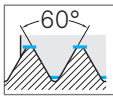
$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

# Ref. 3214

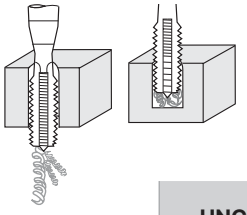
## MACHO RECTO MÁQUINA UNC
UNC Machine Straight Tap
Taraud droit machine UNC




HSSE 5%Co | DIN 376 | C 2-3h | Tol. 2B | α 10° ± 2




**Estándar americano para rosca gruesa**
**U.S standard for coarse thread**
Norme américaine pour le filetage grossier



≤ 1,5D

| UNC | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| UNC 7/16 | 14 | 100 | 22 | 8,00 | 6,20 | 4 | 70485 | 36,16 |
| UNC 1/2 | 13 | 110 | 25 | 9,00 | 7,00 | 4 | 70486 | 39,65 |
| UNC 9/16 | 12 | 110 | 26 | 11,00 | 9,00 | 4 | 70488 | 54,03 |
| UNC 5/8 | 11 | 110 | 28 | 12,00 | 9,00 | 4 | 70489 | 52,43 |
| UNC 3/4 | 10 | 125 | 30 | 14,00 | 11,00 | 4 | 70491 | 69,44 |
| UNC 7/8 | 9 | 140 | 32 | 18,00 | 14,50 | 4 | 70492 | 91,33 |
| UNC 1" | 8 | 160 | 36 | 18,00 | 14,50 | 4 | 70494 | 119,91 |
| UNC 1"1/8 | 7 | 180 | 40 | 22,00 | 18,00 | 4 | 75339 | 145,41 |

| Material Grupo | Material Sub. | Vc (m/min) 5%Co |
|---|---|---|
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

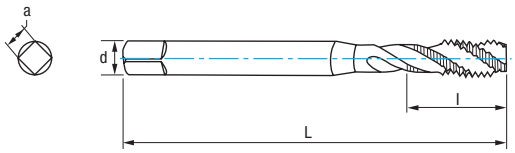
$$P = \frac{25{,}40}{\text{Hilos Threads - Filets}}$$

Vf (mm/min.) = r.p.m. x f

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

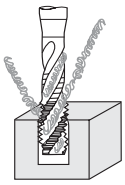
# Ref. 3154

## MACHO HELICOIDAL MÁQUINA UNC MANGO REFORZADO
Reinforced Shank UNC Machine Spiral Tap
Taraud hélicoïdal machine UNC queue renforcée




HSSE 5%Co | DIN 371 | C 2-3h | Tol. 2B | 35° | α 10° ± 2 | 60°

**Estándar americano para rosca gruesa**
**U.S standard for coarse thread**
Norme américaine pour le filetage grossier



< 2D

| UNC | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| UNC N°5 | 40 | 56 | 5 | 3,50 | 2,70 | 3 | 10621 | 29,89 |
| UNC N°6 | 32 | 56 | 7 | 4,00 | 3,00 | 3 | 75634 | 29,89 |
| UNC N°8 | 32 | 63 | 7 | 4,50 | 3,40 | 3 | 59071 | 29,89 |
| UNC N°10 | 24 | 70 | 8 | 6,00 | 4,90 | 3 | 75636 | 31,36 |
| UNC N°12 | 24 | 80 | 10 | 6,00 | 4,90 | 3 | 10624 | 29,89 |
| UNC 1/4 | 20 | 80 | 10 | 7,00 | 5,40 | 3 | 75537 | 30,23 |
| UNC 5/16 | 18 | 90 | 13 | 8,00 | 6,20 | 3 | 75541 | 34,13 |
| UNC 3/8 | 16 | 90 | 15 | 9,00 | 7,00 | 3 | 75539 | 38,40 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

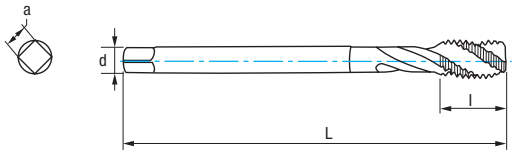
$$P = \frac{25{,}40}{\text{Hilos Threads - Filets}}$$

Vf (mm/min.) = r.p.m. x f

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

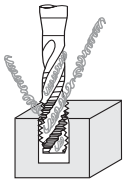
# Ref. 3254

## MACHO HELICOIDAL MÁQUINA UNC
UNC Machine Spiral Tap
Taraud hélicoïdal machine UNC




HSSE 5%Co | DIN 376 | C 2-3h | Tol. 2B | 35° | α 10° ± 2 | 60°

**Estándar americano para rosca gruesa**
**U.S standard for coarse thread**
Norme américaine pour le filetage grossier



< 2D

| UNC | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| UNC 7/16 | 14 | 100 | 18 | 8,00 | 6,20 | 3 | 70507 | 46,55 |
| UNC 1/2 | 13 | 110 | 20 | 9,00 | 7,00 | 3 | 70495 | 50,89 |
| UNC 9/16 | 12 | 110 | 20 | 11,00 | 9,00 | 3 | 70509 | 69,09 |
| UNC 5/8 | 11 | 110 | 20 | 12,00 | 9,00 | 3 | 70500 | 67,23 |
| UNC 3/4 | 10 | 125 | 25 | 14,00 | 11,00 | 4 | 70497 | 89,02 |
| UNC 7/8 | 9 | 140 | 25 | 18,00 | 14,50 | 4 | 70506 | 139,29 |
| UNC 1" | 8 | 160 | 30 | 18,00 | 14,50 | 4 | 70510 | 174,74 |
| UNC 1"1/8 | 7 | 180 | 35 | 22,00 | 18,00 | 4 | 10627 | 216,80 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

$$P = \frac{25{,}40}{\text{Hilos Threads - Filets}}$$

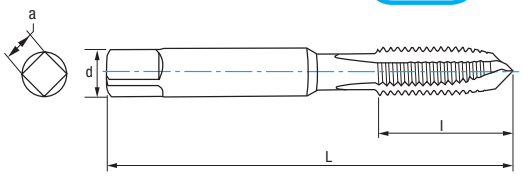
Vf (mm/min.) = r.p.m. x f

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

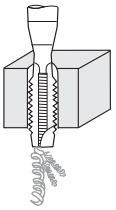
# Ref. 3103

## MACHO RECTO MÁQUINA UNC NORMA ISO 529
ISO 529 Norm Standard UNC Machine Straight Tap
Taraud droit machine UNC norme ISO 529

New!




HSS | ISO 529 | B 3,5-5h | C 2-3h | Tol. 6H | GUN | α 10-12° | 60°



≤ 2D

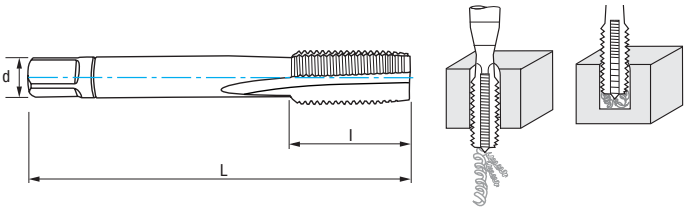
| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | HSS |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

| | | | | | | | B 3,5-5h | | C 2-3h | |
|---|---|---|---|---|---|---|---|---|---|---|
| UNC | Hilos Threads Filets | L mm | l mm | d mm | a mm | z | N° Art. 5% Co | € | N° Art. 5% Co | € |
| UNC N°1 | 64 | 41 | 8 | 2,50 | 2,00 | 3 | 62989 | 20,45 | 62990 | 20,45 |
| UNC N°2 | 56 | 45 | 10 | 2,80 | 2,24 | 3 | 62991 | 20,45 | 62992 | 20,45 |
| UNC N°3 | 48 | 45 | 10 | 2,80 | 2,24 | 3 | 62994 | 20,45 | 62995 | 20,45 |
| UNC N°4 | 40 | 48 | 11 | 3,15 | 2,50 | 3 | 62996 | 20,45 | 62997 | 20,45 |
| UNC N°5 | 40 | 48 | 11 | 3,15 | 2,50 | 3 | 62998 | 19,56 | 62999 | 19,56 |
| UNC N°6 | 32 | 50 | 13 | 3,55 | 2,80 | 3 | 63000 | 17,62 | 63001 | 17,62 |
| UNC N°8 | 32 | 53 | 13 | 4,50 | 3,55 | 3 | 63003 | 17,62 | 63004 | 17,62 |
| UNC N°10 | 24 | 58 | 16 | 5,00 | 4,00 | 3 | 63006 | 18,50 | 63007 | 18,50 |
| UNC N°12 | 24 | 62 | 17 | 5,60 | 4,50 | 3 | 63009 | 17,65 | 63012 | 17,65 |
| UNC 1/4 | 20 | 66 | 19 | 6,30 | 5,00 | 3 | 63016 | 13,93 | 63018 | 13,93 |
| UNC 5/16 | 18 | 72 | 22 | 8,00 | 6,30 | 3 | 63019 | 18,93 | 63021 | 18,93 |
| UNC 3/8 | 16 | 80 | 24 | 10,00 | 8,00 | 3 | 63022 | 21,12 | 63027 | 21,12 |
| UNC 7/16 | 14 | 85 | 25 | 8,00 | 6,30 | 3 | 63028 | 29,96 | 63030 | 29,96 |
| UNC 1/2 | 13 | 89 | 29 | 9,00 | 7,10 | 3 | 63031 | 33,33 | 63033 | 33,33 |
| UNC 9/16 | 12 | 95 | 30 | 11,20 | 9,00 | 3 | 63034 | 33,85 | 63036 | 33,85 |
| UNC 5/8 | 11 | 102 | 32 | 12,50 | 10,00 | 3 | 63038 | 34,77 | 63039 | 34,77 |
| UNC 3/4 | 10 | 112 | 37 | 14,00 | 11,20 | 3 | 63040 | 48,89 | 63042 | 48,89 |
| UNC 7/8 | 9 | 118 | 38 | 16,00 | 12,50 | 3 | 63043 | 66,48 | 63045 | 66,48 |
| UNC 1" | 8 | 130 | 45 | 18,00 | 14,00 | 3 | 63046 | 79,31 | 63047 | 79,31 |
| UNC 1"1/8 | 7 | 138 | 48 | 20,00 | 16,00 | 4 | 63048 | 103,67 | 63049 | 103,67 |
| UNC 1"1/4 | 7 | 151 | 51 | 22,40 | 18,00 | 4 | 63051 | 146,36 | 63052 | 146,36 |
| UNC 1"3/8 | 6 | 162 | 57 | 25,00 | 20,00 | 4 | 63054 | 195,07 | 63057 | 195,07 |
| UNC 1"1/2 | 6 | 170 | 60 | 28,00 | 22,40 | 4 | 63058 | 219,43 | 63060 | 219,43 |
| UNC 1"3/4 | 5 | 187 | 67 | 31,50 | 25,00 | 4 | 63061 | 329,17 | 63063 | 329,17 |
| UNC 2" | 4 | 200 | 70 | 35,50 | 28,00 | 4 | 63064 | 414,40 | 63066 | 414,40 |

# Ref. 3034

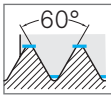
## JUEGO MACHOS MANO UNC
UNC Hand Tap Set
Jeu de tarauds à main UNC




≤ 1,5D

| HSS | DIN 352 | C 2-3h | DIN 352 | | Tol. 2B | α 10° ± 2 | **N°1 Desbaste Roughing** Ébauche | **N°2 Semidesbaste Semiroughing** Semi-Ébauche | **N°3 Acabado Finishing** - Finition **(Ref. 3004)** |
|---|---|---|---|---|---|---|---|---|---|

| Grupo Group-Groupe | Subgrup. | Grupo Group-Groupe | Grupo Group-Groupe | Subgrup. |
|---|---|---|---|---|
| **P** | **P.1** | **K** | **N** | **N.1 - N.3 N.4 - N.5** |



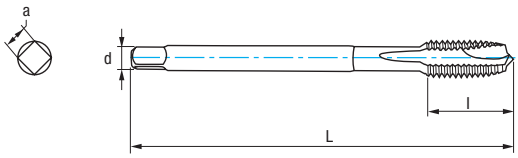

**Estándar americano para rosca gruesa**
**U.S standard for coarse thread**
Norme américaine pour le filetage grossier

| UNC | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **UNC N°4** | **40** | 40 | 12 | 3,50 | 2,70 | 3 | 75595 | **44,52** |
| **UNC N°5** | **40** | 40 | 12 | 3,50 | 2,70 | 3 | 75594 | **42,40** |
| **UNC N°6** | **32** | 45 | 14 | 4,00 | 3,00 | 3 | 75596 | **42,40** |
| **UNC N°8** | **32** | 45 | 14 | 4,50 | 3,40 | 3 | 75597 | **42,40** |
| **UNC N°10** | **24** | 50 | 16 | 6,00 | 4,90 | 3 | 75598 | **42,40** |
| **UNC N°12** | **24** | 50 | 18 | 6,00 | 4,90 | 3 | 75599 | **42,40** |
| **UNC 1/4** | **20** | 56 | 19 | 6,00 | 4,90 | 3 | 62732 | **42,40** |
| **UNC 5/16** | **18** | 56 | 22 | 6,00 | 4,90 | 3 | 62744 | **45,80** |
| **UNC 3/8** | **16** | 63 | 24 | 7,00 | 5,50 | 3 | 62738 | **51,72** |
| **UNC 7/16** | **14** | 70 | 24 | 8,00 | 6,20 | 3 | 62750 | **67,44** |
| **UNC 1/2** | **13** | 75 | 29 | 9,00 | 7,00 | 3 | 75115 | **77,58** |
| **UNC 9/16** | **12** | 80 | 30 | 11,00 | 9,00 | 4 | 62753 | **91,60** |
| **UNC 5/8** | **11** | 80 | 32 | 12,00 | 9,00 | 4 | 62741 | **126,35** |
| **UNC 3/4** | **10** | 95 | 40 | 14,00 | 11,00 | 4 | 62735 | **171,99** |
| **UNC 7/8** | **9** | 100 | 40 | 18,00 | 14,50 | 4 | 62747 | **211,89** |
| **UNC 1"** | **8** | 110 | 50 | 18,00 | 14,50 | 4 | 62756 | **286,15** |

**Macho único Ref. 3004 bajo demanda**
**Single Tap Ref. 3004 upon request**
Taraud Ref. 3004 sur demande

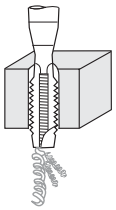
# Ref. 3127

## MACHO RECTO MÁQUINA UNF
UNF Machine Straight Tap
Taraud droit machine UNF




PMX | HARD | DIN 374 | B 3,5-5h | Tol. 2B | GUN | α 10° ± 2 | 60°

**Estándar americano para rosca fina**
**U.S. standard for fine thread**
Norme américaine pour le filetage fin



< 2D

| Material | | Vc (m/min) * |
|---|---|---|
| Grupo | Sub. | HARD |
| P | P.2 | 6-8 |
| | P.5 | 6-10 |
| M | | 8-14 |
| N | N.1 | 10-15 |
| | N.2 | 12-20 |

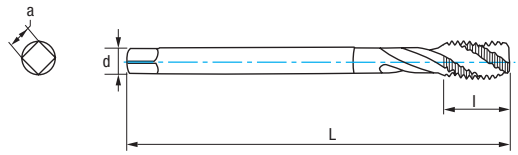
*** Posible Uso en Seco: Vc -50 %**
*** Possible Dry-Use: Vc -50%**
* Emploi possible à sec: Vc -50 %

**Avance f = P (Paso - Pitch - Pas)**
**Vf (mm/min.) = r.p.m. x f**
**r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$**

| UNF | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| **UNF Nº10** | **32** | 70 | 13 | 3,50 | 2,70 | 3 | 71386 | **39,84** |
| **UNF 1/4** | **28** | 80 | 15 | 4,50 | 3,40 | 3 | 71380 | **44,35** |
| **UNF 5/16** | **24** | 90 | 18 | 6,00 | 4,90 | 3 | 71384 | **47,34** |
| **UNF 3/8** | **24** | 90 | 20 | 7,00 | 5,50 | 3 | 71382 | **56,11** |

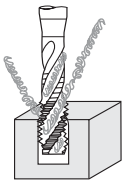
# Ref. 3124

## MACHO HELICOIDAL MÁQUINA UNF
UNF Machine Spiral Tap
Taraud hélicoïdal machine UNF




PMX | HARD | DIN 374 | C 2-3h | Tol. 2B | 35° | α 10° ± 2 | 60°

**Estándar americano para rosca fina**
**U.S. standard for fine thread**
Norme américaine pour le filetage fin



< 2D

| Material | | Vc (m/min) * |
|---|---|---|
| Grupo | Sub. | HARD |
| P | P.2 | 6-8 |
| | P.5 | 6-10 |
| M | | 8-14 |
| N | N.1 | 10-15 |
| | N.2 | 12-20 |

*** Posible Uso en Seco: Vc -50 %**
*** Possible Dry-Use: Vc -50%**
* Emploi possible à sec: Vc -50 %

**Avance f = P (Paso - Pitch - Pas)**
**Vf (mm/min.) = r.p.m. x f**
**r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$**

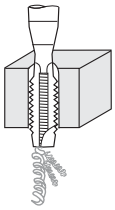
| UNF | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. HARD | € |
|---|---|---|---|---|---|---|---|---|
| **UNF Nº10** | **32** | 70 | 8 | 3,50 | 2,70 | 3 | 69506 | **38,68** |
| **UNF 1/4** | **28** | 80 | 10 | 4,50 | 3,40 | 3 | 69508 | **43,07** |
| **UNF 5/16** | **24** | 90 | 13 | 6,00 | 4,90 | 3 | 69509 | **45,96** |
| **UNF 3/8** | **24** | 90 | 15 | 7,00 | 5,50 | 3 | 69511 | **54,48** |

# Ref. 3204

## MACHO RECTO MÁQUINA UNF
UNF Machine Straight Tap
Taraud droit machine UNF

HSSE 5%Co | DIN 374 | B 3,5-5h | Tol. 2B | GUN | α 10 -14° | 60°

**Estándar americano para rosca fina**
**U.S. standard for fine thread**
Norme américaine pour le filetage fin



< 2D

| UNF | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **UNF N°5** | **44** | 56 | 9 | 2,20 | | 3 | 59868 | **17,44** |
| **UNF N°6** | **40** | 56 | 11 | 2,50 | 2,10 | 3 | 59869 | **15,77** |
| **UNF N°8** | **36** | 63 | 12 | 2,80 | 2,10 | 3 | 59870 | **15,77** |
| **UNF N°10** | **32** | 70 | 13 | 3,50 | 2,70 | 3 | 59073 | **16,34** |
| **UNF N°12** | **28** | 80 | 15 | 4,00 | 3,00 | 3 | 59871 | **19,28** |
| **UNF 1/4** | **28** | 80 | 15 | 4,50 | 3,40 | 3 | 75744 | **17,02** |
| **UNF 5/16** | **24** | 90 | 18 | 6,00 | 4,90 | 3 | 75751 | **19,60** |
| **UNF 3/8** | **24** | 90 | 20 | 7,00 | 5,50 | 3 | 62933 | **20,01** |
| **UNF 7/16** | **20** | 100 | 20 | 8,00 | 6,20 | 3 | 70461 | **28,94** |
| **UNF 1/2** | **20** | 100 | 22 | 9,00 | 7,00 | 3 | 70465 | **30,84** |
| **UNF 9/16** | **18** | 100 | 22 | 11,00 | 9,00 | 3 | 70467 | **37,83** |
| **UNF 5/8** | **18** | 100 | 22 | 12,00 | 9,00 | 3 | 70468 | **42,59** |
| **UNF 3/4** | **16** | 100 | 25 | 14,00 | 11,00 | 3 | 70470 | **54,55** |
| **UNF 7/8** | **14** | 125 | 24 | 18,00 | 14,50 | 3 | 59872 | **60,79** |
| **UNF 1"** | **12** | 140 | 26 | 18,00 | 14,50 | 3 | 59873 | **79,65** |
| **UNF 1"1/8** | **12** | 150 | 28 | 22,00 | 18,00 | 4 | 59874 | **108,62** |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance **f** = **P** (Paso - Pitch - Pas)

$$P = \frac{25{,}40}{\text{Hilos Threads - Filets}}$$

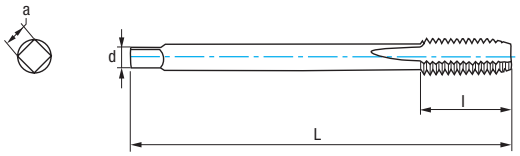
Vf (mm/min.) = r.p.m. x f

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \text{ø}}$$

**Ref. 3204**
**bajo demanda**
**upon request**
sur demande

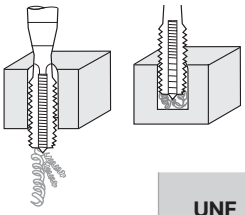
# Ref. 3224

## MACHO RECTO MÁQUINA UNF
UNF Machine Straight Tap
Taraud droit machine UNF




HSSE 5%Co | DIN 374 | C 2-3h | Tol. 2B | α 10° ± 2 | 60°

**Estándar americano para rosca fina**
**U.S. standard for fine thread**
Norme américaine pour le filetage fin



≤ 1,5D

| UNF | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **UNF 5/16** | **24** | 90 | 22 | 6,00 | 4,90 | 3 | 22576 | **16,08** |
| **UNF 3/8** | **24** | 90 | 20 | 7,00 | 5,50 | 3 | 20655 | **17,30** |
| **UNF 7/16** | **20** | 100 | 20 | 8,00 | 6,20 | 3 | 22578 | **23,78** |
| **UNF 1/2** | **20** | 100 | 22 | 9,00 | 7,00 | 3 | 22579 | **25,32** |
| **UNF 9/16** | **18** | 100 | 22 | 11,00 | 9,00 | 3 | 70543 | **31,12** |
| **UNF 5/8** | **18** | 100 | 22 | 12,00 | 9,00 | 3 | 70537 | **35,02** |
| **UNF 3/4** | **16** | 110 | 25 | 14,00 | 11,00 | 3 | 70534 | **44,81** |
| **UNF 7/8** | **14** | 125 | 25 | 18,00 | 14,50 | 3 | 70540 | **56,36** |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance **f** = **P** (Paso - Pitch - Pas)

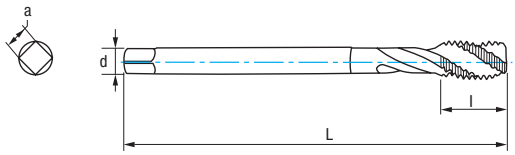
$$P = \frac{25{,}40}{\text{Hilos Threads - Filets}}$$

Vf (mm/min.) = r.p.m. x f

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \text{ø}}$$

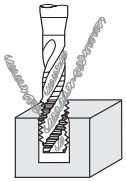
# Ref. 3244

## MACHO HELICOIDAL MÁQUINA UNF
UNF Machine Spiral Tap
Taraud hélicoïdal machine UNF




HSSE 5%Co | DIN 374 | C 2-3h | Tol. 2B | 35° | α 10° ± 2 | 60°

**Estándar americano para rosca fina**
**U.S. standard for fine thread**
Norme américaine pour le filetage fin



< 2D

| UNF | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| UNF N°5 | 44 | 56 | 5 | 2,20 | | 3 | 10633 | 22,26 |
| UNF N°6 | 40 | 56 | 7 | 2,50 | 2,10 | 3 | 10641 | 21,03 |
| UNF N°8 | 36 | 63 | 7 | 2,80 | 2,10 | 3 | 10642 | 21,11 |
| UNF N°10 | 32 | 70 | 8 | 3,50 | 2,70 | 3 | 10645 | 22,53 |
| UNF N°12 | 28 | 80 | 10 | 4,00 | 3,00 | 3 | 10648 | 26,15 |
| UNF 1/4 | 28 | 80 | 10 | 4,00 | 3,00 | 3 | 24118 | 27,01 |
| UNF 5/16 | 24 | 90 | 12 | 6,00 | 4,90 | 3 | 70459 | 27,86 |
| UNF 3/8 | 24 | 90 | 13 | 7,00 | 5,50 | 3 | 70471 | 32,06 |
| UNF 7/16 | 20 | 100 | 15 | 8,00 | 6,20 | 3 | 70479 | 42,14 |
| UNF 1/2 | 20 | 100 | 16 | 9,00 | 7,00 | 3 | 70474 | 44,85 |
| UNF 9/16 | 18 | 100 | 17 | 11,00 | 9,00 | 3 | 70480 | 55,50 |
| UNF 5/8 | 18 | 100 | 19 | 12,00 | 9,00 | 3 | 70477 | 62,02 |
| UNF 3/4 | 16 | 110 | 21 | 14,00 | 11,00 | 4 | 70476 | 79,32 |
| UNF 7/8 | 14 | 125 | 23 | 18,00 | 14,50 | 4 | 70473 | 121,34 |
| UNF 1" | 12 | 140 | 22 | 18,00 | 14,50 | 4 | 10651 | 148,73 |
| UNF 1"1/8 | 12 | 150 | 25 | 22,00 | 18,00 | 4 | 10654 | 176,11 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

**Avance f =** **P** (Paso - Pitch - Pas)

$$P = \frac{25{,}40}{\text{Hilos Threads - Filets}}$$

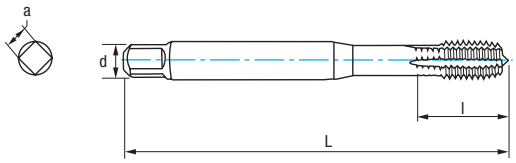
**Vf (mm/min.) = r.p.m. x f**

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

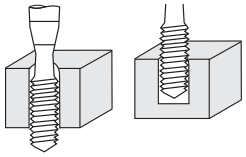
# Ref. 3141

## MACHO LAMINACIÓN ALTO RENDIMIENTO UNC/UNF
UNC/UNF High Performance Cold Forming Machine Tap
Taraud machine réfouleur haut rendement UNC/UNF

New!




HSSE 5%Co | TIALN + TIN | DIN 371 < 7/16 | DIN 376 ≥ 7/16 | C 2-3h | Tol. 2BX | 60°



≤ 1,5D

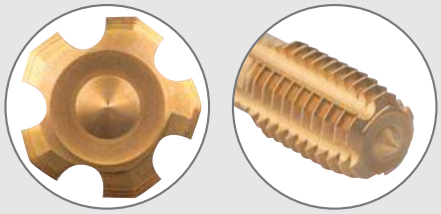
| Material | | Vc (m/min.) |
|---|---|---|
| Grupo | Sub. | TIALN-TIN |
| P | P.1 | 10-30 |
| | P.2 | 10-30 |
| | P.3 | 8-15 |
| | P.5 | 10-25 |
| M | | 10-25 |
| N | N.1 | 20-40 |
| | N.2 | 20-40 |
| | N.3 | 20-40 |
| | N.4 | 20-40 |
| | N.5 | 20-40 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$

| UNC | Hilos Threads Filets | L mm | l mm | d mm | a mm | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|
| UNC N°5 | 40 | 56 | 7 | 3,5 | 2,7 | 10812 | 64,07 |
| UNC N°6 | 32 | 56 | 6 | 4,0 | 3,0 | 10818 | 66,12 |
| UNC N°8 | 32 | 63 | 7 | 4,5 | 3,4 | 10821 | 70,16 |
| UNC N°10 | 24 | 70 | 8 | 6,0 | 4,9 | 10824 | 70,86 |
| UNC N°12 | 24 | 80 | 10 | 6,0 | 4,9 | 10828 | 71,22 |
| UNC 1/4 | 20 | 80 | 13 | 7,0 | 5,5 | 10829 | 105,20 |
| UNC 5/16 | 18 | 90 | 13 | 8,0 | 6,2 | 10830 | 105,20 |
| UNC 3/8 | 16 | 100 | 15 | 10,0 | 8,0 | 10848 | 113,61 |
| UNC 7/16 | 14 | 100 | 15 | 8,0 | 6,2 | 10850 | 91,14 |
| UNC 1/2 | 13 | 110 | 18 | 9,0 | 7,0 | 10851 | 120,63 |
| UNC 5/8 | 11 | 110 | 20 | 12,0 | 9,0 | 10860 | 137,80 |

| UNF | Hilos Threads Filets | L mm | l mm | d mm | a mm | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|
| UNF N°5 | 44 | 56 | 7,0 | 3,5 | 2,7 | 10861 | 70,47 |
| UNF N°6 | 40 | 56 | 6,0 | 4,0 | 3,0 | 10863 | 72,74 |
| UNF N°8 | 36 | 63 | 7,0 | 4,5 | 3,4 | 10864 | 77,19 |
| UNF N°10 | 32 | 70 | 8,0 | 6,0 | 4,9 | 10866 | 77,96 |
| UNF N°12 | 28 | 80 | 10,0 | 6,0 | 4,9 | 10873 | 78,36 |
| UNF 1/4 | 28 | 80 | 10,0 | 6,0 | 4,9 | 10887 | 115,73 |
| UNF 5/16 | 24 | 90 | 13,0 | 8,0 | 6,2 | 10888 | 115,73 |
| UNF 3/8 | 24 | 100 | 15,0 | 10,0 | 8,0 | 10891 | 124,97 |
| UNF 7/16 | 20 | 100 | 15,0 | 8,0 | 6,2 | 10892 | 100,26 |
| UNF 1/2 | 20 | 110 | 15,0 | 9,0 | 7,0 | 10893 | 132,69 |
| UNF 5/8 | 18 | 110 | 15,0 | 12,0 | 9,0 | 10896 | 151,60 |
| UNF 3/4 | 16 | 120 | 17,0 | 14,0 | 11,0 | 10905 | 221,42 |

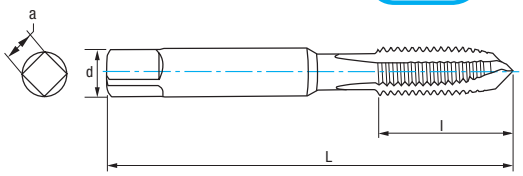
**Ref. 3141 bajo demanda / upon request** / sur demande



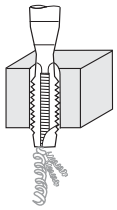
# Ref. 3123

## MACHO RECTO MÁQUINA UNF NORMA ISO 529
ISO 529 Norm Standard UNF Machine Straight Tap
Taraud droit machine UNF norme ISO 529

New!




HSS | ISO 529 | B 3,5-5h | C 2-3h | Tol. 6H | GUN | α 10-12° | 60°



≤ 2D

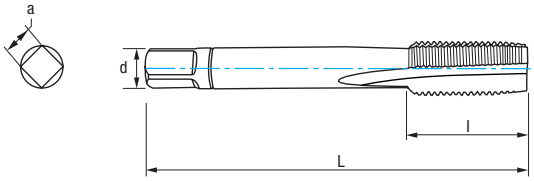
| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | HSS |
| P | P.1 | 6-10 |
| N | N.1 | 5-8 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |

Avance f = P (Paso - Pitch - Pas)
Vf (mm/min.) = r.p.m. x f
r.p.m. = $\frac{Vc \times 1.000}{\pi \times \varnothing}$

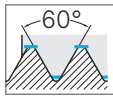
| | | | | | | | B 3,5-5h | | C 2-3h | |
|---|---|---|---|---|---|---|---|---|---|---|
| UNF | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € | N° Art. HSS | € |
| UNF N°0 | 80 | 41 | 8 | 2,50 | 2,00 | 3 | 63067 | 16,19 | 66203 | 16,19 |
| UNF N°1 | 72 | 41 | 8 | 2,50 | 2,00 | 3 | 63069 | 16,19 | 66205 | 16,19 |
| UNF N°2 | 64 | 45 | 10 | 2,80 | 2,24 | 3 | 63070 | 16,19 | 66398 | 16,19 |
| UNF N°3 | 56 | 45 | 10 | 2,80 | 2,24 | 3 | 84231 | 16,19 | 84232 | 16,19 |
| UNF N°4 | 48 | 48 | 11 | 3,15 | 2,50 | 3 | 63072 | 16,19 | 66410 | 16,19 |
| UNF N°5 | 44 | 48 | 11 | 3,15 | 2,50 | 3 | 63075 | 15,49 | 66413 | 15,49 |
| UNF N°6 | 40 | 50 | 13 | 3,55 | 2,80 | 3 | 63076 | 13,25 | 66509 | 13,25 |
| UNF N°8 | 36 | 53 | 13 | 4,50 | 3,55 | 3 | 63079 | 13,25 | 66512 | 13,25 |
| UNF N°10 | 32 | 58 | 16 | 5,00 | 4,00 | 3 | 63112 | 13,73 | 66566 | 13,73 |
| UNF N°12 | 28 | 62 | 17 | 5,60 | 4,50 | 3 | 63171 | 14,74 | 66596 | 14,74 |
| UNF 1/4 | 28 | 66 | 19 | 6,30 | 5,00 | 3 | 63172 | 13,33 | 66722 | 13,33 |
| UNF 5/16 | 24 | 72 | 22 | 8,00 | 6,30 | 3 | 63173 | 17,90 | 66728 | 17,90 |
| UNF 3/8 | 24 | 80 | 24 | 10,00 | 8,00 | 3 | 63174 | 18,87 | 67163 | 18,87 |
| UNF 7/16 | 20 | 85 | 25 | 8,00 | 6,30 | 3 | 63175 | 27,71 | 67169 | 27,71 |
| UNF 1/2 | 20 | 89 | 29 | 9,00 | 7,10 | 3 | 63177 | 29,53 | 67349 | 29,53 |
| UNF 9/16 | 18 | 95 | 30 | 11,20 | 9,00 | 3 | 63180 | 27,01 | 67358 | 27,01 |
| UNF 5/8 | 18 | 102 | 32 | 12,50 | 10,00 | 3 | 63181 | 32,07 | 67359 | 32,07 |
| UNF 3/4 | 16 | 112 | 37 | 14,00 | 11,20 | 3 | 63184 | 43,67 | 67361 | 43,67 |
| UNF 7/8 | 14 | 118 | 38 | 16,00 | 12,50 | 3 | 63213 | 50,32 | 67364 | 50,32 |
| UNF 1" | 12 | 130 | 45 | 18,00 | 14,00 | 3 | 63326 | 59,88 | 67370 | 59,88 |
| UNF 1"1/8 | 12 | 127 | 37 | 20,00 | 16,00 | 4 | 63389 | 80,26 | 67373 | 80,26 |
| UNF 1"1/4 | 12 | 137 | 37 | 22,40 | 18,00 | 4 | 63392 | 113,31 | 67376 | 113,31 |
| UNF 1"3/8 | 12 | 144 | 39 | 25,00 | 20,00 | 4 | 63446 | 151,03 | 67394 | 151,03 |
| UNF 1"1/2 | 12 | 149 | 39 | 28,00 | 22,40 | 4 | 64121 | 169,89 | 67403 | 169,89 |

# Ref. 3024

## JUEGO MACHOS MANO UNF
UNF Hand Tap Set
Jeu de tarauds à main UNF



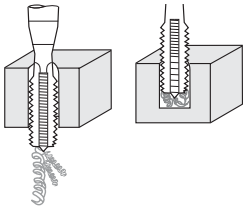

HSS | DIN 2181 | C 2-3h | Tol. 2B | α 10° ± 2




**Estándar americano para rosca fina**
**U.S. standard for fine thread**
Norme américaine pour le filetage fin

**N°1 Desbaste** Roughing Ébauche | **N°3 Acabado** Finishing - Finition **(Ref. 3014)**

| Grupo Group-Groupe | Subgrup. |
|---|---|
| **P** | **P.1** |
| **K** | |
| **N** | **N.1 - N.3 N.4 - N.5** |



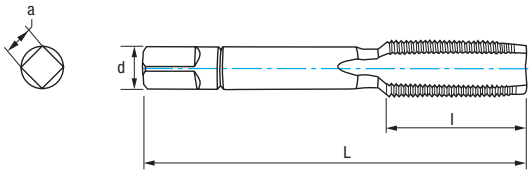
≤ 1,5D

| UNF | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **UNF N°5** | **44** | 40 | 9 | 3,50 | 2,70 | 3 | 75601 | **33,71** |
| **UNF N°6** | **40** | 45 | 10 | 4,00 | 3,00 | 3 | 75602 | **32,31** |
| **UNF N°8** | **36** | 45 | 10 | 4,50 | 3,40 | 3 | 75603 | **32,31** |
| **UNF N°10** | **32** | 50 | 12 | 6,00 | 4,90 | 3 | 75604 | **32,31** |
| **UNF N°12** | **28** | 50 | 12 | 6,00 | 4,90 | 3 | 75605 | **33,71** |
| **UNF 1/4** | **28** | 50 | 14 | 6,00 | 4,90 | 3 | 62462 | **27,10** |
| **UNF 5/16** | **24** | 56 | 22 | 6,00 | 4,90 | 3 | 62477 | **29,61** |
| **UNF 3/8** | **24** | 63 | 20 | 7,00 | 5,50 | 3 | 62471 | **33,53** |
| **UNF 7/16** | **20** | 63 | 20 | 8,00 | 6,20 | 3 | 62483 | **44,52** |
| **UNF 1/2** | **20** | 70 | 22 | 9,00 | 7,00 | 3 | 62459 | **45,48** |
| **UNF 9/16** | **18** | 70 | 22 | 11,00 | 9,00 | 4 | 62486 | **59,30** |
| **UNF 5/8** | **18** | 70 | 22 | 12,00 | 9,00 | 4 | 62474 | **76,58** |
| **UNF 3/4** | **16** | 80 | 22 | 14,00 | 11,00 | 4 | 62465 | **102,94** |
| **UNF 7/8** | **14** | 80 | 22 | 18,00 | 14,50 | 4 | 62480 | **132,23** |
| **UNF 1"** | **12** | 80 | 22 | 18,00 | 14,50 | 4 | 62489 | **175,37** |
| **UNF 1"1/4** | **12** | 90 | 22 | 22,00 | 18,00 | 4 | 76158 | **341,57** |

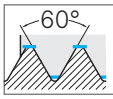
**Macho único Ref. 3014 bajo demanda**
**Single Tap Ref. 3014 upon request**
Taraud Ref. 3014 sur demande

# Ref. 3025

## JUEGO MACHOS MANO UNEF
UNEF Hand Tap Set
Jeu de tarauds à main UNEF

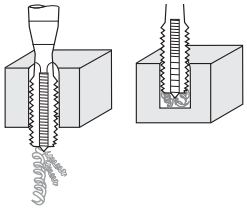



HSS | DIN 2181 | C 2-3h | Tol. 2B | α 10° ± 2




**Estándar americano para rosca extra fina**
**U.S. standard for extra fine thread**
Norme américaine pour le filetage extra fin

| **N°1 Desbaste** **Roughing** Ébauche | **N°3 Acabado** **Finishing** - Finition **(Ref. 3014)** | **Grupo** **Group**-Groupe | **Subgrup.** | **Grupo** **Group**-Groupe | **Grupo** **Group**-Groupe | **Subgrup.** |
|---|---|---|---|---|---|---|
| | | **P** | **P.1** | **K** | **N** | **N.1 - N.3** **N.4 - N.5** |

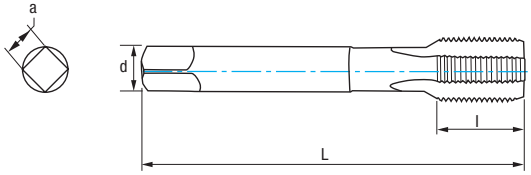


≤ 1,5D

| UNEF | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **UNEF 1/4** | 32 | 50 | 18 | 6 | 4,90 | 3 | 38269 | **68,66** |
| **UNEF 5/16** | 32 | 56 | 22 | 6 | 4,90 | 3 | 75857 | **76,70** |
| **UNEF 3/8** | 32 | 63 | 22 | 7 | 5,50 | 3 | 75863 | **87,76** |
| **UNEF 7/16** | 28 | 63 | 22 | 8 | 6,20 | 4 | 38270 | **111,71** |
| **UNEF 1/2** | 28 | 75 | 24 | 9 | 7,00 | 4 | 75876 | **126,23** |
| **UNEF 9/16** | 24 | 80 | 28 | 11 | 9,00 | 4 | 16853 | **147,66** |
| **UNEF 5/8** | 24 | 80 | 28 | 12 | 9,00 | 4 | 38271 | **205,52** |
| **UNEF 3/4** | 20 | 95 | 32 | 14 | 11,00 | 4 | 38272 | **304,34** |
| **UNEF 1"** | 20 | 110 | 40 | 18 | 14,50 | 4 | 38273 | **435,47** |

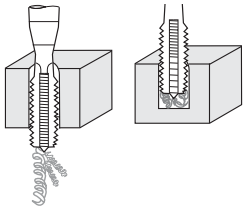
# Ref. 3209

## MACHO RECTO MÁQUINA UN
UN Machine Straight Tap
Taraud droit machine UN




| HSSE 5%Co | DIN 374 | C 2-3h | Tol. 2B | | α 10° ± 2 | 60° |
|---|---|---|---|---|---|---|

**Estándar americano para rosca de paso fijo**
**U.S. standard for fixed pitch**
Norme américaine pour le filetage à pas fixe



≤ 1,5D

| UN | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **UN 1"1/8** | **8** | 180 | 45 | 22 | 18,00 | 4 | 38311 | **171,67** |
| **UN 1"1/4** | **8** | 180 | 45 | 22 | 18,00 | 4 | 38312 | **221,46** |
| **UN 1"3/8** | **8** | 200 | 56 | 28 | 22,00 | 4 | 38313 | **251,23** |
| **UN 1"1/2** | **8** | 200 | 60 | 32 | 24,00 | 5 | 38314 | **329,85** |
| **UN 1"5/8** | **8** | 200 | 60 | 32 | 24,00 | 5 | 38315 | **385,84** |
| **UN 1"3/4** | **8** | 200 | 50 | 36 | 29,00 | 5 | 38316 | **470,01** |
| **UN 2"** | **8** | 225 | 50 | 40 | 32,00 | 5 | 38317 | **503,60** |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

**Avance f =** **P** (Paso - Pitch - Pas)

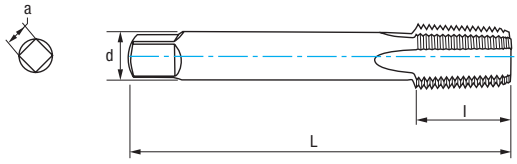
$$P = \frac{25{,}40}{\text{Hilos Threads - Filets}}$$

**Vf (mm/min.) = r.p.m. x f**

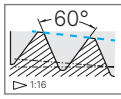
$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

# Ref. 3107

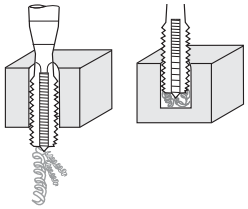
## MACHO RECTO MÁQUINA NPT
NPT Machine Straight Tap
Taraud droit machine NPT




HSSE 5%Co | DIN 374 | C 2-3h | α 10° ± 2




**Estándar americano para tubos y acoples**
**U.S. standard thread for sealing pipes and fittings**
Norme américaine pour les tuyaux et les raccords




| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

**Avance f =** **P (Paso - Pitch - Pas)**

$$P = \frac{25{,}40}{\text{Hilos Threads - Filets}}$$

**Vf (mm/min.) = r.p.m. x f**

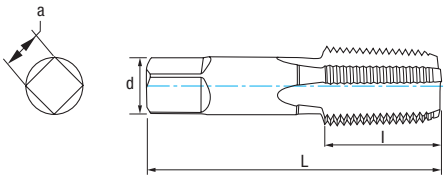
$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

| NPT | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| **NPT 1/8** | **27,00** | 90 | 20,00 | 7 | 5,50 | 3 | 77890 | **37,73** |
| **NPT 1/4** | **18,00** | 100 | 22,00 | 11 | 9,00 | 3 | 15165 | **46,00** |
| **NPT 3/8** | **18,00** | 100 | 22,00 | 12 | 9,00 | 4 | 75872 | **59,11** |
| **NPT 1/2** | **14,00** | 125 | 28,00 | 16 | 12,00 | 4 | 15830 | **76,95** |
| **NPT 3/4** | **14,00** | 140 | 28,00 | 20 | 16,00 | 4 | 77892 | **119,21** |
| **NPT 1"** | **11,50** | 160 | 38,00 | 25 | 20,00 | 4 | 17937 | **154,94** |
| **NPT 1"1/2** | **11,50** | 190 | 42,00 | 36 | 29,00 | 6 | 17941 | **333,14** |
| **NPT 2"** | **11,50** | 220 | 52,00 | 45 | 35,00 | 6 | 17946 | **522,50** |

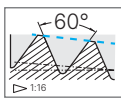
**Ref. 3107 bajo demanda / upon request** / sur demande

# Ref. 3017

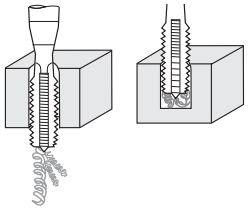
## MACHO ÚNICO MANO NPT
NPT Hand Single Tap
Taraud à main NPT




HSS | DIN 2181 | | 1,5-2h | α 10° ± 2



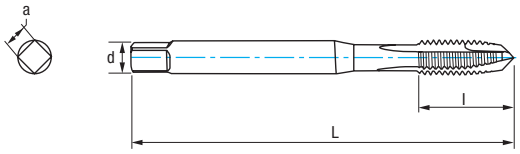

**Estándar americano para tubos y acoples**
**U.S. standard thread for sealing pipes and fittings**
Norme américaine pour les tuyaux et les raccords




| NPT | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **NPT 1/8** | **27,00** | 65 | 19 | 7 | 5,50 | 3 | 62315 | **25,34** |
| **NPT 1/4** | **18,00** | 70 | 25 | 11 | 9,00 | 3 | 62309 | **35,57** |
| **NPT 3/8** | **18,00** | 75 | 26 | 12 | 9,00 | 4 | 62327 | **49,06** |
| **NPT 1/2** | **14,00** | 80 | 31 | 16 | 12,00 | 4 | 62303 | **68,66** |
| **NPT 3/4** | **14,00** | 100 | 33 | 20 | 16,00 | 4 | 62321 | **104,89** |
| **NPT 1"** | **11,50** | 110 | 38 | 25 | 20,00 | 4 | 62330 | **116,85** |
| **NPT 1"1/4** | **11,50** | 125 | 41 | 32 | 24,00 | 6 | 17945 | **191,58** |
| **NPT 1"1/2** | **11,50** | 140 | 42 | 36 | 29,00 | 6 | 17944 | **291,09** |
| **NPT 2"** | **11,50** | 160 | 44 | 36 | 29,00 | 6 | 76063 | **454,39** |

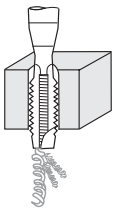
# Ref. 3102

## MACHO RECTO MÁQUINA BSW (WHITWORTH) MANGO REFORZADO
Reinforced Shank BSW (Whitworth) Machine Straight Tap
Taraud droit machine BSW (Whitworth) queue renforcée




HSSE 5%Co | DIN 371 | B 3,5-5h | GUN | α 10 -12° | 55°

**Estándar británico para rosca gruesa**
**British standard for coarse thread**
Norme britannique pour le filetage grossier



≤ 2D

| BSW | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| W1/8 | 40 | 56 | 11 | 3,50 | 2,70 | 3 | 62897 | 18,58 |
| W5/32 | 32 | 63 | 13 | 4,50 | 3,40 | 3 | 62915 | 18,58 |
| W3/16 | 24 | 70 | 15 | 6,00 | 4,90 | 3 | 62903 | 18,58 |
| W1/4 | 20 | 80 | 17 | 7,00 | 5,50 | 3 | 62894 | 21,15 |
| W5/16 | 18 | 90 | 20 | 8,00 | 6,20 | 3 | 62912 | 24,76 |
| W3/8 | 16 | 100 | 22 | 9,00 | 7,00 | 3 | 73766 | 27,36 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

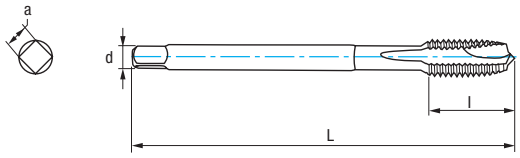
$P = \frac{25,40}{\text{Hilos Threads - Filets}}$

Vf (mm/min.) = r.p.m. x f

$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$

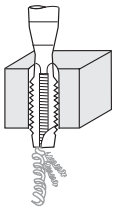
# Ref. 3202

## MACHO RECTO MÁQUINA BSW (WHITWORTH)
BSW (Whitworth) Machine Straight Tap
Taraud droit machine BSW (Whitworth)




HSSE 5%Co | DIN 376 | B 3,5-5h | GUN | α 10 -12° | 55°

**Estándar británico para rosca gruesa**
**British standard for coarse thread**
Norme britannique pour le filetage grossier



≤ 1,5D

| BSW | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| W1/4 | 20 | 80 | 17 | 4,50 | 3,40 | 3 | 59861 | 17,08 |
| W5/16 | 18 | 90 | 20 | 6,00 | 4,90 | 3 | 14979 | 20,01 |
| W3/8 | 16 | 100 | 22 | 7,00 | 5,50 | 3 | 70420 | 22,10 |
| W7/16 | 14 | 100 | 22 | 8,00 | 6,20 | 3 | 70446 | 27,92 |
| W1/2 | 12 | 110 | 24 | 9,00 | 7,00 | 3 | 70417 | 29,21 |
| W9/16 | 12 | 110 | 26 | 11,00 | 9,00 | 3 | 70447 | 40,13 |
| W5/8 | 11 | 110 | 27 | 12,00 | 9,00 | 3 | 70443 | 37,93 |
| W3/4 | 10 | 125 | 30 | 14,00 | 11,00 | 4 | 70419 | 56,57 |
| W7/8 | 9 | 140 | 32 | 18,00 | 14,50 | 4 | 70444 | 68,81 |
| W1" | 8 | 160 | 36 | 20,00 | 16,00 | 4 | 70449 | 86,50 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

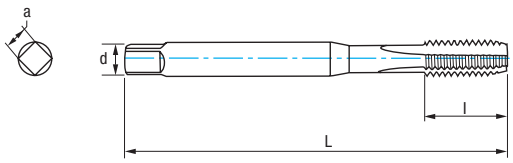
$P = \frac{25,40}{\text{Hilos Threads - Filets}}$

Vf (mm/min.) = r.p.m. x f

$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$

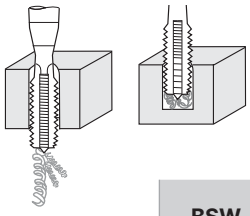
# Ref. 3112

## MACHO RECTO MÁQUINA BSW (WHITWORTH) MANGO REFORZADO
Reinforced Shank BSW (Whitworth) Machine Straight Tap
Taraud droit machine BSW (Whitworth) queue renforcée




HSSE 5%Co | DIN 371 | C 2-3h | α 10° ± 2 | 55°

**Estándar británico para rosca gruesa**
**British standard for coarse thread**
Norme britannique pour le filetage grossier



≤ 1,5D

| BSW | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| W3/32 | 48 | 50 | 9 | 2,80 | 2,10 | 3 | 75415 | 20,15 |
| W1/8 | 40 | 56 | 11 | 3,50 | 2,70 | 3 | 75413 | 16,82 |
| W5/32 | 32 | 63 | 13 | 4,50 | 3,40 | 3 | 75129 | 16,82 |
| W3/16 | 24 | 70 | 15 | 6,00 | 4,90 | 3 | 75414 | 16,82 |
| W7/32 | 24 | 80 | 16 | 6,00 | 4,90 | 3 | 75418 | 25,57 |
| W1/4 | 20 | 80 | 17 | 7,00 | 5,50 | 3 | 75412 | 19,19 |
| W5/16 | 18 | 90 | 20 | 8,00 | 6,20 | 3 | 75458 | 17,20 |
| W3/8 | 16 | 100 | 22 | 9,00 | 7,00 | 3 | 75456 | 24,93 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

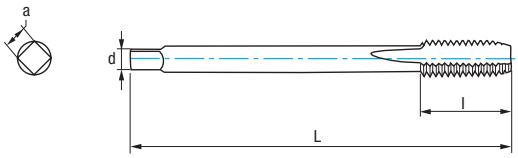
$P = \frac{25,40}{\text{Hilos Threads - Filets}}$

Vf (mm/min.) = r.p.m. x f

$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$

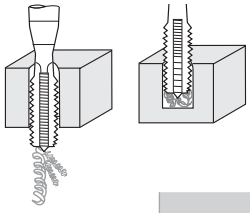
# Ref. 3212

## MACHO RECTO MÁQUINA BSW (WHITWORTH)
BSW (Whitworth) Machine Straight Tap
Taraud droit machine BSW (Whitworth)




HSSE 5%Co | DIN 376 | C 2-3h | α 10° ± 2 | 55°

**Estándar británico para rosca gruesa**
**British standard for coarse thread**
Norme britannique pour le filetage grossier



≤ 1,5D

| BSW | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| W3/8 | 16,00 | 100 | 22 | 7,00 | 5,50 | 3 | 70395 | 21,18 |
| W7/16 | 14,00 | 100 | 22 | 8,00 | 6,20 | 3 | 70396 | 27,89 |
| W1/2 | 12,00 | 110 | 24 | 9,00 | 7,00 | 3 | 70398 | 26,78 |
| W9/16 | 12,00 | 110 | 26 | 11,00 | 9,00 | 3 | 70399 | 38,40 |
| W5/8 | 11,00 | 110 | 27 | 12,00 | 9,00 | 3 | 70401 | 36,34 |
| W3/4 | 10,00 | 125 | 30 | 14,00 | 11,00 | 4 | 70402 | 51,46 |
| W7/8 | 9,00 | 140 | 32 | 18,00 | 14,50 | 4 | 70416 | 65,83 |
| W1" | 8,00 | 160 | 36 | 20,00 | 16,00 | 4 | 70404 | 82,76 |
| W1"1/8 | 7,00 | 180 | 40 | 22,00 | 18,00 | 4 | 70450 | 126,29 |
| W1"1/4 | 7,00 | 180 | 40 | 22,00 | 18,00 | 4 | 70452 | 183,33 |
| W1"3/8 | 6,00 | 200 | 50 | 28,00 | 22,00 | 4 | 70453 | 301,42 |
| W1"1/2 | 6,00 | 200 | 50 | 32,00 | 24,00 | 4 | 70455 | 327,24 |
| W1"5/8 | 5,00 | 220 | 58 | 36,00 | 29,00 | 4 | 70456 | 456,93 |
| W1"7/8 | 4,50 | 220 | 58 | 36,00 | 29,00 | 4 | 70458 | 596,73 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

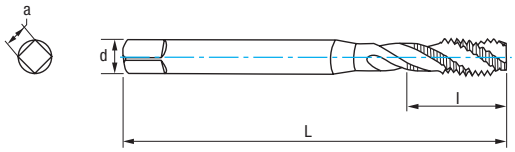
$P = \frac{25,40}{\text{Hilos Threads - Filets}}$

Vf (mm/min.) = r.p.m. x f

$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$

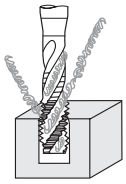
# Ref. 3152

## MACHO HELICOIDAL MÁQUINA BSW (WHITWORTH) MANGO REFORZADO
Reinforced Shank BSW (Whitworth) Spiral Machine Tap
Taraud helicoidal machine BSW (Whitworth) queue renforcée




HSSE 5%Co | DIN 371 | C 2-3h | 35° | α 10° ± 2 | 55°

**Estándar británico para rosca gruesa**
**British standard for coarse thread**
Norme britannique pour le filetage grossier



< 2D

| BSW | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| W1/8 | 40 | 56 | 5 | 3,50 | 2,70 | 3 | 63152 | 21,15 |
| W5/32 | 32 | 63 | 7 | 4,50 | 3,40 | 3 | 63170 | 21,15 |
| W3/16 | 24 | 70 | 8 | 6,00 | 4,90 | 3 | 63161 | 21,15 |
| W1/4 | 20 | 80 | 10 | 7,00 | 5,50 | 3 | 63149 | 23,87 |
| W5/16 | 18 | 90 | 12 | 8,00 | 6,20 | 3 | 63167 | 27,98 |
| W3/8 | 16 | 100 | 14 | 9,00 | 7,00 | 3 | 63158 | 31,96 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

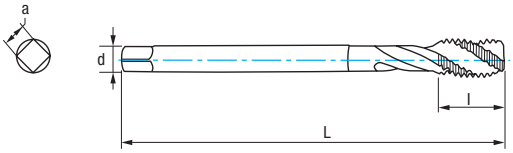
$P = \frac{25,40}{\text{Hilos Threads - Filets}}$

Vf (mm/min.) = r.p.m. x f

$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$

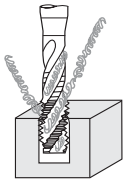
# Ref. 3252

## MACHO HELICOIDAL MÁQUINA BSW (WHITWORTH)
BSW (Whitworth) Machine Spiral Tap
Taraud helicoidal machine BSW (Whitworth)




HSSE 5%Co | DIN 376 | C 2-3h | 35° | α 10° ± 2 | 55°

**Estándar británico para rosca gruesa**
**British standard for coarse thread**
Norme britannique pour le filetage grossier



< 2D

| BSW | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| W3/16 | 24 | 70 | 8 | 3,50 | 2,70 | 3 | 59857 | 16,27 |
| W1/4 | 20 | 80 | 13 | 4,50 | 3,40 | 3 | 59858 | 22,05 |
| W5/16 | 18 | 90 | 14 | 6,00 | 4,90 | 3 | 59859 | 25,85 |
| W3/8 | 16 | 100 | 16 | 7,00 | 5,50 | 3 | 70408 | 28,53 |
| W7/16 | 14 | 100 | 16 | 8,00 | 6,20 | 3 | 70411 | 41,09 |
| W1/2 | 12 | 110 | 18 | 9,00 | 7,00 | 3 | 70405 | 39,38 |
| W9/16 | 12 | 110 | 20 | 11,00 | 9,00 | 3 | 70413 | 55,99 |
| W5/8 | 11 | 110 | 20 | 12,00 | 9,00 | 3 | 70410 | 53,40 |
| W3/4 | 10 | 125 | 25 | 14,00 | 11,00 | 4 | 70407 | 71,52 |
| W7/8 | 9 | 140 | 27 | 18,00 | 14,50 | 4 | 10909 | 76,35 |
| W1" | 8 | 160 | 30 | 20,00 | 16,00 | 4 | 70414 | 121,46 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

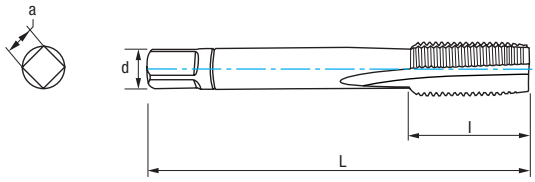
$P = \frac{25,40}{\text{Hilos Threads - Filets}}$

Vf (mm/min.) = r.p.m. x f

$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$

# Ref. 3032

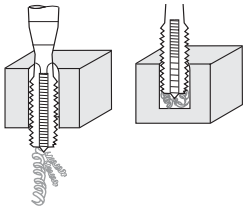
## JUEGO MACHOS MANO BSW (WHITWORTH)
BSW (Whitworth) Hand Tap Set
Jeu de tarauds à main BSW (Whitworth)




HSS | DIN 352 | C 2-3h | α 10° ± 2 | 55°

**Estándar británico para rosca gruesa**
**British standard for coarse thread**
Norme britannique pour le filetage grossier

| N°1 Desbaste Roughing Ébauche | N°2 Semidesbaste Semiroughing Semi-Ébauche | N°3 Acabado Finishing - Finition (Ref. 3012) | Grupo Group-Groupe | Subgrup. | Grupo Group-Groupe | Grupo Group-Groupe | Subgrup. |
|---|---|---|---|---|---|---|---|
| | | | **P** | **P.1** | **K** | **N** | **N.1 - N.3 N.4 - N.5** |

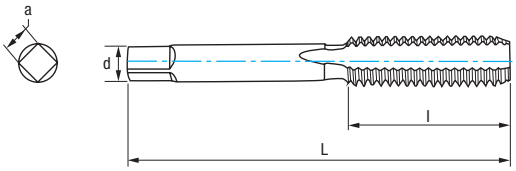


≤ 1,5D

| BSW | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **W3/32** | **48,00** | 36 | 10 | 2,80 | 2,10 | 3 | 62663 | **28,15** |
| **W1/8** | **40,00** | 40 | 12 | 3,50 | 2,70 | 3 | 62642 | **22,91** |
| **W5/32** | **32,00** | 45 | 14 | 4,50 | 3,40 | 3 | 62675 | **22,91** |
| **W3/16** | **24,00** | 50 | 18 | 6,00 | 4,90 | 3 | 62660 | **22,91** |
| **W7/32** | **24,00** | 50 | 18 | 6,00 | 4,90 | 3 | 62684 | **34,63** |
| **W1/4** | **20,00** | 50 | 19 | 6,00 | 4,90 | 3 | 62633 | **26,06** |
| **W5/16** | **18,00** | 56 | 22 | 6,00 | 4,90 | 4 | 62669 | **31,02** |
| **W3/8** | **16,00** | 70 | 24 | 7,00 | 5,50 | 4 | 62654 | **34,33** |
| **W7/16** | **14,00** | 70 | 24 | 8,00 | 6,20 | 4 | 62681 | **44,96** |
| **W1/2** | **12,00** | 75 | 29 | 9,00 | 7,00 | 4 | 62630 | **49,67** |
| **W9/16** | **12,00** | 80 | 30 | 11,00 | 9,00 | 4 | 62687 | **67,11** |
| **W5/8** | **11,00** | 80 | 32 | 12,00 | 9,00 | 4 | 62666 | **77,63** |
| **W3/4** | **10,00** | 95 | 40 | 14,00 | 11,00 | 4 | 62645 | **110,49** |
| **W7/8** | **9,00** | 100 | 40 | 18,00 | 14,50 | 4 | 62678 | **137,22** |
| **W1"** | **8,00** | 110 | 50 | 18,00 | 14,50 | 4 | 62693 | **169,43** |
| **W1"1/8** | **7,00** | 132 | 56 | 22,00 | 18,00 | 4 | 62702 | **251,18** |
| **W1"1/4** | **7,00** | 132 | 56 | 22,00 | 18,00 | 4 | 62699 | **297,08** |
| **W1"3/8** | **6,00** | 150 | 63 | 28,00 | 22,00 | 4 | 42713 | **369,49** |
| **W1"1/2** | **6,00** | 150 | 63 | 32,00 | 24,00 | 4 | 62696 | **444,83** |
| **W1"5/8** | **5,00** | 160 | 70 | 32,00 | 24,00 | 4 | 59880 | **572,89** |
| **W1"3/4** | **5,00** | 160 | 70 | 36,00 | 29,00 | 6 | 59881 | **705,11** |
| **W1"7/8** | **4,50** | 190 | 80 | 36,00 | 29,00 | 6 | 59882 | **910,69** |
| **W2"** | **4,50** | 190 | 80 | 40,00 | 32,00 | 6 | 59883 | **956,04** |

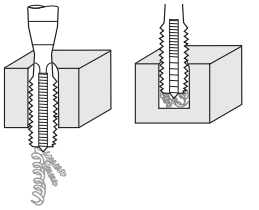
# Ref. 3012

## MACHO ÚNICO MANO BSW (WHITWORTH)
BSW (Whitworth) Hand Tap
Taraud à main BSW (Whitworth)



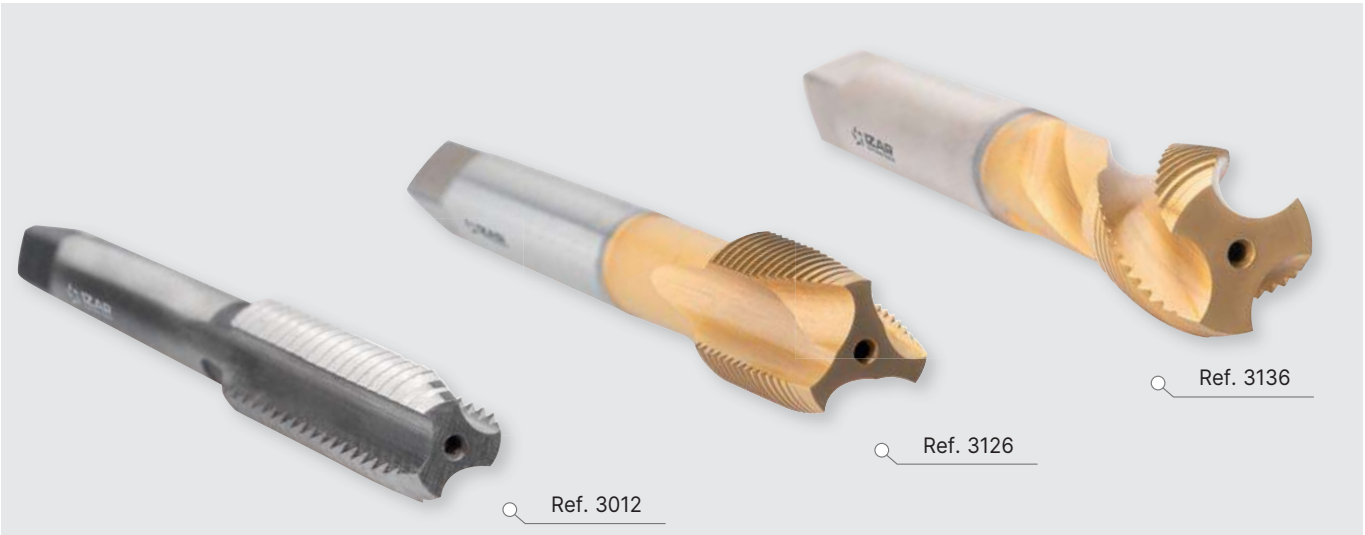

| HSS | DIN 352 | C 2-3h | | α 10° ± 2 | **N°3 Acabado Finishing** Finition | 55° | **Estándar británico para rosca gruesa British standard for coarse thread** Norme britannique pour le filetage grossier |
|---|---|---|---|---|---|---|---|

| Grupo Group-Groupe | Subgrup. | Grupo Group-Groupe | Grupo Group-Groupe | Subgrup. |
|---|---|---|---|---|
| **P** | **P.1** | **K** | **N** | **N.1 - N.3 N.4 - N.5** |



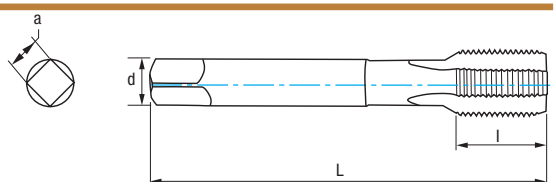
≤ 1,5D

| BSW | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **W3/32** | **48,00** | 40 | 9 | 2,80 | 2,10 | 3 | 75404 | **9,39** |
| **W1/8** | **40,00** | 40 | 14 | 3,50 | 2,70 | 3 | 75401 | **7,65** |
| **W5/32** | **32,00** | 45 | 17 | 4,50 | 3,40 | 3 | 75069 | **7,65** |
| **W3/16** | **24,00** | 50 | 19 | 6,00 | 4,90 | 3 | 74825 | **7,65** |
| **W7/32** | **24,00** | 50 | 19 | 6,00 | 4,90 | 3 | 75409 | **11,56** |
| **W1/4** | **20,00** | 50 | 20 | 6,00 | 4,90 | 3 | 75400 | **8,68** |
| **W5/16** | **18,00** | 56 | 20 | 6,00 | 4,90 | 4 | 75406 | **10,36** |
| **W3/8** | **16,00** | 63 | 22 | 7,00 | 5,50 | 4 | 75403 | **11,44** |
| **W7/16** | **14,00** | 70 | 22 | 8,00 | 6,20 | 4 | 75408 | **14,99** |
| **W1/2** | **12,00** | 75 | 25 | 9,00 | 7,00 | 4 | 75399 | **16,55** |
| **W9/16** | **12,00** | 80 | 26 | 11,00 | 9,00 | 4 | 75448 | **22,35** |
| **W5/8** | **11,00** | 80 | 27 | 12,00 | 9,00 | 4 | 75405 | **25,88** |
| **W3/4** | **10,00** | 95 | 32 | 14,00 | 11,00 | 4 | 75402 | **36,84** |
| **W7/8** | **9,00** | 100 | 32 | 18,00 | 14,50 | 4 | 75407 | **45,75** |
| **W1"** | **8,00** | 110 | 36 | 18,00 | 14,50 | 4 | 75410 | **56,48** |
| **W1" 1/8** | **7,00** | 125 | 40 | 22,00 | 18,00 | 4 | 76255 | **83,73** |
| **W1" 1/4** | **7,00** | 125 | 40 | 22,00 | 18,00 | 4 | 76259 | **100,83** |
| **W1" 3/8** | **6,00** | 150 | 50 | 28,00 | 22,00 | 4 | 76264 | **125,97** |
| **W1" 1/2** | **6,00** | 150 | 50 | 32,00 | 24,00 | 4 | 76269 | **151,69** |
| **W1" 5/8** | **5,00** | 150 | 56 | 32,00 | 24,00 | 4 | 76274 | **197,92** |
| **W1" 3/4** | **5,00** | 160 | 58 | 36,00 | 29,00 | 4 | 76280 | **243,49** |
| **W1" 7/8** | **4,50** | 180 | 65 | 36,00 | 29,00 | 4 | 76286 | **314,50** |
| **W2"** | **4,50** | 180 | 65 | 40,00 | 32,00 | 4 | 76291 | **330,17** |

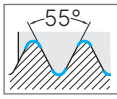


# Ref. 3126

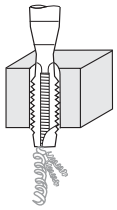
## MACHO RECTO MÁQUINA BSP (GAS) INOX MANGO REFORZADO
Reinforced Shank Stainless BSP (Gas) Metric Machine Straight Tap
Taraud droit machine BSP (Gaz) inox queue renforcée




HSSE 5%Co | TIN | DIN 5156 | B 3,5-5h | GUN | Tol. 2B




**Rosca británica para tubo paralelo (BSPP-GAS)**
British Standard Parallel Pipe (BSPP-GAS)
Filetage britannique pour tuyau parallèle (BSPP-GAS)



≤ 2D

| G | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|---|
| G1/8 | 28 | 90 | 12 | 7 | 5,50 | 3 | 28636 | 43,38 |
| G1/4 | 19 | 100 | 16 | 11 | 9,00 | 3 | 28635 | 58,46 |
| G3/8 | 19 | 100 | 16 | 12 | 9,00 | 3 | 28638 | 69,38 |
| G1/2 | 14 | 125 | 20 | 16 | 12,00 | 3 | 28634 | 86,38 |
| G5/8 | 14 | 125 | 20 | 18 | 14,50 | 4 | 28639 | 101,91 |
| G3/4 | 14 | 140 | 22 | 20 | 16,00 | 4 | 28637 | 137,22 |
| G1" | 11 | 160 | 30 | 25 | 20,00 | 4 | 28641 | 212,90 |
| G1"1/2 | 11 | 190 | 32 | 36 | 29,00 | 6 | 28642 | 767,33 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TIN |
| P | P.5 | 5-8 |
| M | | 8-12 |

Avance f = P (Paso - Pitch - Pas)

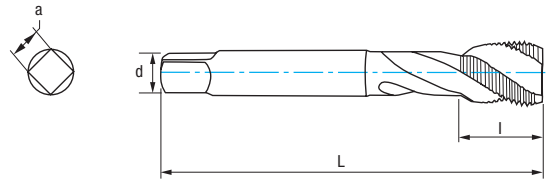
$P = \frac{25,40}{\text{Hilos Threads - Filets}}$

Vf (mm/min.) = r.p.m. x f

$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$

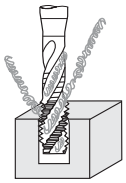
# Ref. 3136

## MACHO HELICOIDAL MÁQUINA BSP (GAS) INOX
Stainless BSP (Gas) Metric Machine Spiral Tap
Taraud hélicoïdal machine BSP (Gaz) Inox




HSSE 5%Co | TIN | DIN 5156 | C 2-3h | 35° | 55°

**Rosca británica para tubo paralelo (BSPP-GAS)**
British Standard Parallel Pipe (BSPP-GAS)
Filetage britannique pour tuyau parallèle (BSPP-GAS)



< 1,5D

| G | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. TIN | € |
|---|---|---|---|---|---|---|---|---|
| G1/8 | 28 | 90 | 12 | 7 | 5,50 | 3 | 28647 | 41,79 |
| G1/4 | 19 | 100 | 16 | 11 | 9,00 | 3 | 28646 | 59,96 |
| G3/8 | 19 | 100 | 16 | 12 | 9,00 | 3 | 28649 | 71,56 |
| G1/2 | 14 | 125 | 20 | 16 | 12,00 | 4 | 28645 | 90,32 |
| G3/4 | 14 | 140 | 22 | 20 | 16,00 | 4 | 28648 | 141,36 |
| G1" | 11 | 160 | 30 | 25 | 20,00 | 4 | 28652 | 219,38 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | TIN |
| P | P.5 | 5-8 |
| M | | 8-12 |

Avance f = P (Paso - Pitch - Pas)

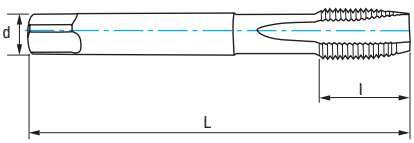
$P = \frac{25,40}{\text{Hilos Threads - Filets}}$

Vf (mm/min.) = r.p.m. x f

$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$

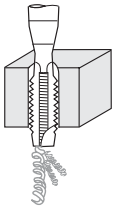
# Ref. 3106

## MACHO RECTO MÁQUINA BSP (GAS)
BSP (Gas) Machine Straight Tap
Taraud droit machine BSP (Gaz)




HSSE 5%Co | DIN 5156 | B 3,5-5h | GUN | α 10° ± 2 | 55°

**Rosca británica para tubo paralelo (BSPP-GAS)**
British Standard Parallel Pipe (BSPP-GAS)
Filetage britannique pour tuyau parallèle (BSPP-GAS)



≤ 2D

| G | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| G1/8 | 28 | 90 | 20 | 7 | 5,50 | 3 | 75479 | 32,14 |
| G1/4 | 19 | 100 | 22 | 11 | 9,00 | 3 | 62936 | 43,31 |
| G3/8 | 19 | 100 | 22 | 12 | 9,00 | 3 | 75481 | 51,39 |
| G1/2 | 14 | 125 | 25 | 16 | 12,00 | 3 | 75478 | 64,86 |
| G5/8 | 14 | 125 | 24 | 18 | 14,50 | 4 | 75482 | 81,98 |
| G3/4 | 14 | 140 | 28 | 20 | 16,00 | 4 | 75480 | 101,63 |
| G1" | 11 | 160 | 30 | 25 | 20,00 | 4 | 75483 | 157,70 |
| G1"1/2 | 11 | 190 | 32 | 36 | 29,00 | 6 | 76221 | 439,69 |

| Material Grupo | Material Sub. | Vc (m/min) 5%Co |
|---|---|---|
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

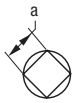
$P = \frac{25,40}{\text{Hilos Threads - Filets}}$

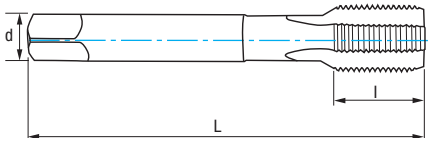
Vf (mm/min.) = r.p.m. x f

$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$

# Ref. 3116

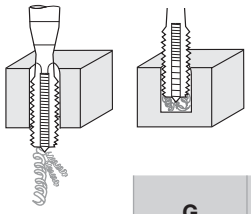
## MACHO RECTO MÁQUINA BSP (GAS)
BSP (Gas) Machine Straight Tap
Taraud droit machine BSP (Gaz)




HSSE 5%Co | DIN 5156 | C 2-3h | α 10° ± 2 | 55°

**Rosca británica para tubo paralelo (BSPP-GAS)**
British Standard Parallel Pipe (BSPP-GAS)
Filetage britannique pour tuyau parallèle (BSPP-GAS)



≤ 1,5D

| G | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| G1/8 | 28 | 90 | 20 | 7 | 5,50 | 3 | 75467 | 28,24 |
| G1/4 | 19 | 100 | 22 | 11 | 9,00 | 3 | 75466 | 39,01 |
| G3/8 | 19 | 100 | 22 | 12 | 9,00 | 3 | 75143 | 46,69 |
| G1/2 | 14 | 125 | 25 | 16 | 12,00 | 3 | 75465 | 59,00 |
| G5/8 | 14 | 125 | 25 | 18 | 14,50 | 4 | 75469 | 73,52 |
| G3/4 | 14 | 140 | 28 | 20 | 16,00 | 4 | 75468 | 92,39 |
| G7/8 | 14 | 150 | 28 | 22 | 18,00 | 4 | 77647 | 135,47 |
| G1" | 11 | 160 | 30 | 25 | 20,00 | 4 | 75470 | 143,35 |
| G1"1/8 | 11 | 170 | 30 | 28 | 22,00 | 4 | 76197 | 219,00 |
| G1"1/4 | 11 | 170 | 30 | 32 | 24,00 | 4 | 76205 | 256,77 |
| G1"1/2 | 11 | 190 | 32 | 36 | 29,00 | 6 | 76219 | 407,82 |
| G1"3/4 | 11 | 190 | 32 | 40 | 32,00 | 6 | 76227 | 484,72 |
| G2" | 11 | 220 | 40 | 45 | 35,00 | 6 | 76233 | 617,65 |

| Material Grupo | Material Sub. | Vc (m/min) 5%Co |
|---|---|---|
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

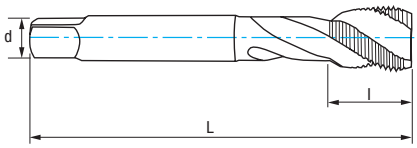
$P = \frac{25,40}{\text{Hilos Threads - Filets}}$

Vf (mm/min.) = r.p.m. x f

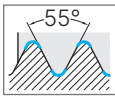
$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$

# Ref. 3156

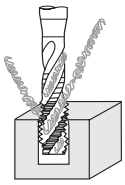
## MACHO HELICOIDAL MÁQUINA BSP (GAS)
BSP (Gas) Machine Spiral Tap
Taraud hélicoïdal machine BSP (Gaz)




HSSE 5%Co | DIN 5156 | C 2-3h | 35° | α 10° ± 2




**Rosca británica para tubo paralelo (BSPP-GAS)**
British Standard Parallel Pipe (BSPP-GAS)
Filetage britannique pour tuyau parallèle (BSPP-GAS)



< 2D

| G | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|---|
| G1/8 | 28 | 90 | 20 | 7 | 5,50 | 3 | 63188 | 34,12 |
| G1/4 | 19 | 100 | 22 | 11 | 9,00 | 3 | 63185 | 48,98 |
| G3/8 | 19 | 100 | 22 | 12 | 9,00 | 3 | 75142 | 58,46 |
| G1/2 | 14 | 125 | 25 | 16 | 12,00 | 4 | 75484 | 73,76 |
| G3/4 | 14 | 140 | 28 | 20 | 16,00 | 4 | 75485 | 115,44 |
| G1" | 11 | 160 | 30 | 25 | 20,00 | 4 | 75487 | 179,15 |
| G1"1/4 | 11 | 170 | 30 | 32 | 24,00 | 5 | 76208 | 260,78 |
| G1"1/2 | 11 | 190 | 32 | 36 | 29,00 | 5 | 76222 | 471,56 |

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | 5%Co |
| P | P.1 | 6-10 |
| K | K.1 | 7-10 |
| | K.2 | 4-7 |
| N | N.1 | 5-8 |
| | N.2 | 8-12 |
| | N.3 | 15-35 |
| | N.4 | 14-20 |
| | N.5 | 12-15 |

Avance f = P (Paso - Pitch - Pas)

$P = \frac{25,40}{\text{Hilos Threads - Filets}}$

Vf (mm/min.) = r.p.m. x f

$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$

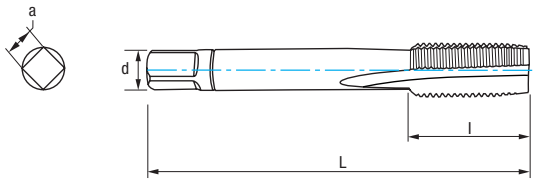
Ref. 3106

Ref. 3116

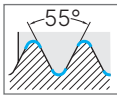
Ref. 3156

# Ref. 3026

## JUEGO MACHOS MANO BSP (GAS)
BSP (Gas) Hand Tap Set
Jeu tarauds à main BSP (Gaz)

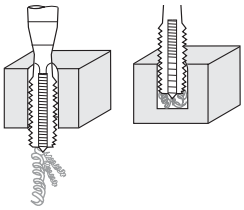



HSS | DIN 5157 | ISO 2284 | B 3,5-5h | C 2-3h | α 10° ± 2




**Rosca Whitworth Paralela (BSPP)**
Whitworth Parallel Thread (BSPP)
Filetage Whitworth Parallèle (BSPP)

| Grupo Group-Groupe | Subgrup. | Grupo Group-Groupe | Grupo Group-Groupe | Subgrup. |
|---|---|---|---|---|
| **P** | **P.1** | **K** | **N** | **N.1 - N.3 N.4 - N.5** |



≤ 1,5D

DIN 5157 | **N°1 Desbaste Roughing** Ébauche | **N°3 Acabado Finishing** Finition

**N°1** **B 3,5-5h**

**N°3** **C 2-3h**

| G | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **G1/8** | **28** | 63 | 20 | 7,00 | 5,50 | 3 | 62510 | **23,49** |
| **G1/4** | **19** | 70 | 22 | 11,00 | 9,00 | 4 | 62504 | **33,05** |
| **G3/8** | **19** | 70 | 22 | 12,00 | 9,00 | 4 | 62516 | **40,61** |
| **G1/2** | **14** | 80 | 22 | 16,00 | 12,00 | 4 | 62498 | **58,27** |
| **G5/8** | **14** | 80 | 22 | 18,00 | 14,50 | 4 | 62522 | **74,52** |
| **G3/4** | **14** | 90 | 22 | 20,00 | 16,00 | 4 | 62513 | **90,97** |
| **G7/8** | **14** | 90 | 22 | 22,00 | 18,00 | 4 | 62525 | **121,34** |
| **G1"** | **11** | 100 | 25 | 25,00 | 20,00 | 4 | 62528 | **144,15** |
| **G1" 1/8** | **11** | 125 | 40 | 28,00 | 22,00 | 4 | 76195 | **225,77** |
| **G1" 1/4** | **11** | 125 | 40 | 32,00 | 24,00 | 4 | 76203 | **246,04** |
| **G1" 3/8** | **11** | 125 | 40 | 36,00 | 29,00 | 4 | 76211 | **334,18** |
| **G1" 1/2** | **11** | 140 | 40 | 36,00 | 29,00 | 6 | 74823 | **371,84** |
| **G1" 3/4** | **11** | 140 | 40 | 40,00 | 32,00 | 6 | 76225 | **618,17** |
| **G2"** | **11** | 160 | 40 | 45,00 | 35,00 | 8 | 76231 | **687,36** |

**New!**

ISO 2284 | **N°3 Acabado Finishing** Finition

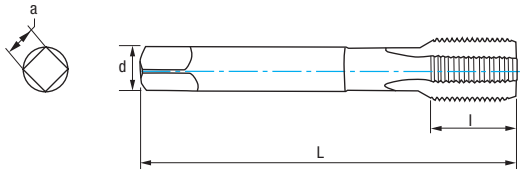
**N°3** **B 3,5-5h**

**N°3** **C 2-3h**

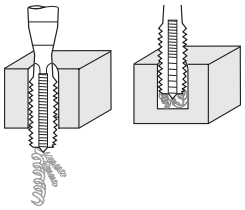
| G | Hilos Threads Filets | L mm | l mm | d mm | a mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **G1/8** | **28** | 59 | 15 | 8,00 | 6,30 | 4 | 26780 | **20,67** |
| **G1/4** | **19** | 67 | 19 | 10,00 | 8,00 | 4 | 26789 | **29,08** |
| **G3/8** | **19** | 75 | 21 | 12,50 | 10,00 | 4 | 26814 | **36,53** |
| **G1/2** | **14** | 87 | 26 | 16,00 | 12,50 | 4 | 26830 | **51,27** |
| **G5/8** | **14** | 91 | 26 | 18,00 | 14,00 | 4 | 26845 | **65,57** |
| **G3/4** | **14** | 96 | 28 | 20,00 | 16,00 | 4 | 26852 | **80,06** |
| **G7/8** | **14** | 102 | 29 | 22,40 | 18,00 | 6 | 26857 | **106,78** |
| **G1"** | **11** | 109 | 33 | 25,00 | 20,00 | 6 | 26860 | **126,86** |
| **G1" 1/8** | **11** | 116 | 34 | 28,00 | 22,40 | 6 | 26891 | **198,68** |
| **G1" 1/4** | **11** | 119 | 36 | 31,50 | 25,00 | 6 | 26950 | **216,51** |
| **G1" 3/8** | **11** | 120 | 36 | 31,50 | 25,00 | 6 | 26954 | **294,08** |
| **G1" 1/2** | **11** | 125 | 37 | 35,50 | 28,00 | 6 | 26973 | **327,21** |
| **G1" 3/4** | **11** | 132 | 39 | 35,50 | 28,00 | 6 | 26988 | **544,00** |
| **G2"** | **11** | 140 | 41 | 40,00 | 31,50 | 6 | 27002 | **604,87** |

# Ref. 3016

## MACHO ÚNICO MANO BSP (GAS)
BSP (Gas) Hand Tap
Taraud à main BSP (Gaz)




HSS | DIN 5157 | ISO 2284 | α 10° ± 2 | 55° Rosca Whitworth Paralela (BSPP) Whitworth Parallel Thread (BSPP) Filetage Whitworth Parallèle (BSPP) | N°3 Acabado Finishing Finition



≤ 1,5D

| Grupo Group-Groupe | Subgrup. |
|---|---|
| P | P.1 |

| Grupo Group-Groupe | Subgrup. |
|---|---|
| K | |

| Grupo Group-Groupe | Subgrup. |
|---|---|
| N | N.1 - N.3 N.4 - N.5 |

DIN 5157 | C 2-3h

N°3

| G | Entrada Chamfer Entrée | Hilos Threads Filets | L mm | l mm | d mm | a mm | z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|---|
| G1/8 | C | 28 | 63 | 20 | 7,00 | 5,50 | 3 | 75461 | 11,77 |
| G1/4 | | 19 | 70 | 22 | 11,00 | 9,00 | 4 | 75460 | 16,53 |
| G3/8 | | 19 | 70 | 22 | 12,00 | 9,00 | 4 | 75462 | 20,77 |
| G1/2 | | 14 | 80 | 22 | 16,00 | 12,00 | 4 | 75459 | 29,12 |
| G5/8 | | 14 | 80 | 22 | 18,00 | 14,50 | 4 | 75463 | 37,26 |
| G3/4 | | 14 | 90 | 22 | 20,00 | 16,00 | 4 | 75106 | 45,47 |
| G7/8 | | 14 | 90 | 22 | 22,00 | 18,00 | 4 | 76246 | 60,67 |
| G1" | | 11 | 100 | 25 | 25,00 | 20,00 | 4 | 75464 | 72,07 |
| G1" 1/8 | | 11 | 125 | 40 | 28,00 | 22,00 | 4 | 76196 | 112,89 |
| G1" 1/4 | | 11 | 125 | 40 | 32,00 | 24,00 | 4 | 76204 | 123,02 |
| G1" 3/8 | | 11 | 140 | 40 | 36,00 | 29,00 | 4 | 76212 | 167,09 |
| G1" 1/2 | | 11 | 140 | 40 | 36,00 | 29,00 | 6 | 76218 | 185,92 |
| G1" 3/4 | | 11 | 140 | 40 | 40,00 | 32,00 | 6 | 76226 | 309,09 |
| G2" | | 11 | 160 | 40 | 45,00 | 35,00 | 8 | 76232 | 343,68 |

New!

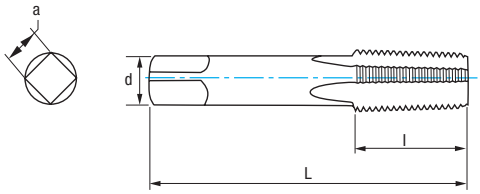
ISO 2284 | B 3,5-5h | C 2-3h

N°3

| G | Entrada Chamfer Entrée | Hilos Threads Filets | L mm | l mm | d mm | a mm | z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|---|
| G1/8 | B | 28 | 59 | 15 | 8,00 | 6,30 | 4 | 26759 | 10,33 |
| | C | | | | | | | 26779 | 10,33 |
| G1/4 | B | 19 | 67 | 19 | 10,00 | 8,00 | 4 | 26781 | 14,54 |
| | C | | | | | | | 26783 | 14,54 |
| G3/8 | B | 19 | 75 | 21 | 12,50 | 10,00 | 4 | 26790 | 18,26 |
| | C | | | | | | | 26791 | 18,26 |
| G1/2 | B | 14 | 87 | 26 | 16,00 | 12,50 | 4 | 26823 | 25,64 |
| | C | | | | | | | 26827 | 25,64 |
| G5/8 | B | 14 | 91 | 26 | 18,00 | 14,00 | 4 | 26832 | 32,79 |
| | C | | | | | | | 26843 | 32,79 |
| G3/4 | B | 14 | 96 | 28 | 20,00 | 16,00 | 4 | 26849 | 40,03 |
| | C | | | | | | | 26850 | 40,03 |
| G7/8 | B | 11 | 102 | 29 | 22,40 | 18,00 | 6 | 26853 | 53,39 |
| | C | | | | | | | 26855 | 53,39 |
| G1" | B | 11 | 109 | 33 | 25,00 | 20,00 | 6 | 26858 | 63,42 |
| | C | | | | | | | 26859 | 63,42 |
| G1" 1/8 | B | 11 | 116 | 34 | 28,00 | 22,40 | 6 | 26862 | 99,34 |
| | C | | | | | | | 26873 | 99,34 |
| G1" 1/4 | B | 11 | 119 | 36 | 31,50 | 25,00 | 6 | 26941 | 108,26 |
| | C | | | | | | | 26948 | 108,26 |
| G1" 3/8 | B | 11 | 120 | 36 | 31,50 | 25,00 | 6 | 26951 | 147,04 |
| | C | | | | | | | 26953 | 147,04 |
| G1" 1/2 | B | 11 | 125 | 37 | 35,50 | 28,00 | 6 | 26956 | 163,61 |
| | C | | | | | | | 26971 | 163,61 |
| G1" 3/4 | B | 11 | 132 | 39 | 35,50 | 28,00 | 6 | 26974 | 272,00 |
| | C | | | | | | | 26976 | 272,00 |
| G2" | B | 11 | 140 | 41 | 40,00 | 31,50 | 8 | 26991 | 302,44 |
| | C | | | | | | | 26997 | 302,44 |

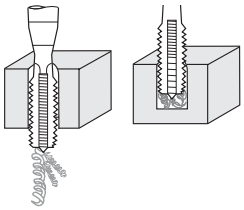
# Ref. 3019

## MACHO ÚNICO MANO BSPT (RC)
BSPT (RC) Hand Single Tap
Taraud à main BSPT (RC)




| HSS | DIN 5157 | C 2-3h | | α 10° ± 2 | N°3 Acabado Finishing Finition | 55° Rosca británica para tubo cónica British Standard Pipe Taper Raccord BSPT |
|---|---|---|---|---|---|---|

| Grupo Group-Groupe | Subgrup. | Grupo Group-Groupe | Grupo Group-Groupe | Subgrup. |
|---|---|---|---|---|
| P | P.1 | K | N | N.1 - N.3 N.4 - N.5 |

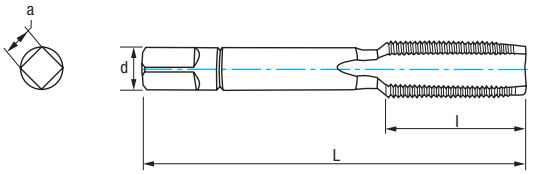


≤ 1,5D

| BSPT | Hilos Threads Filets | L mm | l mm | d mm | a mm | z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| **B1/8** | **28** | 65 | 19 | 7 | 5,50 | 3 | 38254 | **21,80** |
| **B1/4** | **19** | 70 | 25 | 11 | 9,00 | 4 | 38255 | **30,72** |
| **B3/8** | **19** | 75 | 25 | 12 | 9,00 | 5 | 38256 | **42,65** |
| **B1/2** | **14** | 80 | 31 | 16 | 12,00 | 5 | 38257 | **59,72** |
| **B5/8** | **14** | 80 | 36 | 18 | 14,00 | 5 | 38258 | **109,30** |
| **B3/4** | **14** | 85 | 33 | 20 | 17,00 | 5 | 76138 | **101,35** |
| **B7/8** | **14** | 100 | 36 | 22 | 17,00 | 6 | 38259 | **182,16** |
| **B1"** | **11** | 110 | 38 | 25 | 21,50 | 6 | 38260 | **154,32** |

# Ref. 3011

## MACHO ÚNICO MANO PG
PG Hand Single Tap
Taraud à main PG



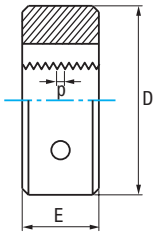

| HSS | DIN 40432 | C 2-3h | | α 10° ± 2 | N°3 Acabado Finishing Finition | 80° Rosca para tubos eléctricos en acero Steel Electric Pipe Thread Filetage tubes electriques en acier |
|---|---|---|---|---|---|---|

| Grupo Group-Groupe | Subgrup. | Grupo Group-Groupe | Grupo Group-Groupe | Subgrup. |
|---|---|---|---|---|
| P | P.1 | K | N | N.1 - N.3 N.4 - N.5 |

| PG | D mm | Hilos Threads Filets | L mm | l mm | d mm | a mm | z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|---|
| **PG 07** | 12,50 | 20 | 70 | 22 | 9 | 7,00 | 4 | 38291 | **22,91** |
| **PG 09** | 15,20 | 18 | 70 | 22 | 12 | 9,00 | 4 | 38292 | **29,12** |
| **PG 11** | 18,60 | 18 | 80 | 22 | 14 | 11,00 | 4 | 38293 | **40,46** |
| **PG 13,5** | 20,40 | 18 | 80 | 22 | 16 | 12,00 | 4 | 38294 | **44,37** |
| **PG 16** | 22,50 | 18 | 80 | 22 | 18 | 14,50 | 4 | 38295 | **53,28** |
| **PG 21** | 28,30 | 16 | 90 | 22 | 22 | 18,00 | 4 | 38296 | **78,36** |
| **PG 29** | 37,00 | 16 | 100 | 25 | 28 | 22,00 | 6 | 38297 | **155,55** |
| **PG 36** | 47,00 | 16 | 140 | 40 | 36 | 29,00 | 6 | 38298 | **259,85** |
| **PG 42** | 54,00 | 16 | 140 | 40 | 40 | 32,00 | 6 | 38299 | **308,60** |
| **PG 48** | 59,30 | 16 | 160 | 40 | 45 | 35,00 | 6 | 38300 | **389,18** |

# Ref. 3540

## COJINETE MÁQUINA MÉTRICA
Metric Machine Die
Filière à machine métrique




| HSS | DIN 223 | Tol. 6g | α 10 - 17° | **Chaflán Entrada 1,75h**<br>**Chamfer 1,75 threads**<br>Chanfrein 1,75 filets | **Rompe Virutas ≥ M4**<br>**Chip Breaker ≥ M4**<br>Brise copeaux ≥ M4 |
|---|---|---|---|---|---|

| M | P | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **M2** | 0,40 | 16 | 5 | 76867 | **31,25** |
| **M2,5** | 0,45 | 16 | 5 | 76869 | **31,25** |
| **M3** | 0,50 | 20 | 5 | 77259 | **26,42** |
| **M3,5** | 0,60 | 20 | 5 | 77260 | **31,25** |
| **M4** | 0,70 | 20 | 5 | 77263 | **26,42** |
| **M5** | 0,80 | 20 | 5 | 76882 | **26,42** |
| **M6** | 1,00 | 20 | 7 | 76888 | **26,42** |
| **M7** | 1,00 | 25 | 9 | 76891 | **28,82** |
| **M8** | 1,25 | 25 | 9 | 76895 | **28,82** |
| **M9** | 1,25 | 25 | 9 | 76898 | **38,44** |
| **M10** | 1,50 | 30 | 11 | 76903 | **38,44** |
| **M11** | 1,50 | 30 | 11 | 76907 | **50,43** |
| **M12** | 1,75 | 38 | 14 | 76912 | **40,84** |
| **M14** | 2,00 | 38 | 14 | 76922 | **40,84** |
| **M16** | 2,00 | 45 | 18 | 76930 | **55,25** |
| **M18** | 2,50 | 45 | 18 | 76938 | **55,25** |
| **M20** | 2,50 | 45 | 18 | 76946 | **55,25** |
| **M22** | 2,50 | 55 | 22 | 76954 | **81,63** |
| **M24** | 3,00 | 55 | 22 | 76961 | **81,63** |
| **M27** | 3,00 | 65 | 25 | 76972 | **122,44** |
| **M30** | 3,50 | 65 | 25 | 76979 | **122,44** |
| **M33** | 3,50 | 65 | 25 | 76986 | **127,28** |

# Ref. 3536

## COJINETE MANO MÉTRICA / MÉTRICA FINA INOX
Stainless Metric / Metric Fine Hand Die
Filière à main métrique / métrique pas fin inox

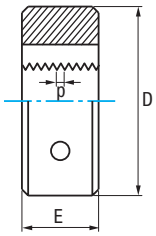
HSSE 5%Co | DIN 22568 | Tol. 6g | α 20°

**Chaflán Entrada 2,25h**
**Chamfer 2,25 threads**
Chanfrein 2,25 filets

**Vaporizado**
Vaporized
Vaporisée

**Grupo Group-Groupe P**

**Grupo Group-Groupe M**




| M/MF | P | D mm | E mm | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **M3** | **0,50** | 20 | 5 | 34255 | **24,22** |
| **M4** | **0,70** | 20 | 5 | 34256 | **24,22** |
| **M5** | **0,80** | 20 | 7 | 34257 | **24,22** |
| **M6** | **1,00** | 20 | 7 | 34258 | **24,44** |
| **M7** | **1,00** | 25 | 9 | 55515 | **26,33** |
| **M8** | **1,25** | 25 | 9 | 34259 | **26,33** |
| MF10 | 0,75 | 30 | 11 | 81370 | **63,96** |
| MF10 | 1,00 | 30 | 11 | 81371 | **50,27** |
| MF10 | 1,25 | 30 | 11 | 81372 | **54,56** |
| **M10** | **1,50** | 30 | 11 | 34260 | **35,22** |
| MF12 | 1,00 | 38 | 10 | 81373 | **63,61** |
| MF12 | 1,25 | 38 | 10 | 81374 | **63,61** |
| MF12 | 1,50 | 38 | 10 | 81375 | **56,87** |
| **M12** | **1,75** | 38 | 14 | 34261 | **45,52** |
| MF14 | 1,00 | 38 | 10 | 81376 | **65,26** |
| MF14 | 1,50 | 38 | 10 | 81377 | **59,43** |
| **M14** | **2,00** | 38 | 14 | 34262 | **45,52** |
| MF15 | 1,00 | 38 | 10 | 81378 | **60,57** |
| MF16 | 1,00 | 45 | 14 | 81379 | **95,31** |

| M/MF | P | D mm | E mm | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| MF16 | 1,50 | 45 | 14 | 81380 | **86,03** |
| **M16** | **2,00** | 45 | 18 | 34263 | **63,12** |
| MF17 | 1,00 | 45 | 14 | 81381 | **76,23** |
| MF18 | 1,00 | 45 | 14 | 81382 | **92,32** |
| MF18 | 1,50 | 45 | 14 | 81383 | **81,63** |
| MF18 | 2,00 | 45 | 14 | 81384 | **92,32** |
| **M18** | **2,50** | 45 | 18 | 34264 | **63,12** |
| MF20 | 1,00 | 45 | 14 | 81385 | **91,91** |
| MF20 | 1,50 | 45 | 14 | 81386 | **84,24** |
| MF20 | 2,00 | 45 | 14 | 81387 | **92,57** |
| **M20** | **2,50** | 45 | 18 | 34265 | **63,12** |
| MF22 | 1,00 | 55 | 16 | 81388 | **136,88** |
| MF22 | 1,50 | 55 | 16 | 81389 | **125,00** |
| MF22 | 2,00 | 55 | 16 | 81390 | **136,88** |
| **M22** | **2,50** | 55 | 22 | 81391 | **119,15** |
| MF24 | 1,50 | 55 | 16 | 81392 | **125,00** |
| **M24** | **3,00** | 55 | 22 | 81393 | **119,15** |
| **M27** | **3,00** | 65 | 25 | 81394 | **184,43** |
| **M30** | **3,50** | 65 | 25 | 81395 | **192,26** |
| **M33** | **3,50** | 65 | 25 | 83117 | **230,75** |

### 7 Pcs

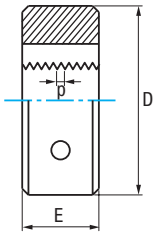
| Cont. | N° Art. HSS | € |
|---|---|---|
| **Cojinetes / Dies /** Filières **DIN 223: M3-M4-M5-M6-M8-M10-M12** | 76494 | **204,17** |

# Ref. 3500

## COJINETE MANO MÉTRICA / MÉTRICA FINA
Metric / Metric Fine Hand Die
Filière â main métrique / métrique pas fin

HSS | DIN 223 | Tol. 6g | α 10 - 17°

**Chaflán Entrada 1,75h**
**Chamfer 1,75 threads**
Chanfrein 1,75 filets




| M/MF | P | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **M2** | **0,40** | 16 | 5 | 63191 | **26,01** |
| **M2,5** | **0,45** | 16 | 5 | 75001 | **26,01** |
| **M3** | **0,50** | 20 | 5 | 63194 | **22,02** |
| **M3,5** | **0,60** | 20 | 5 | 63197 | **26,01** |
| MF4 | 0,50 | 20 | 5 | 77025 | **35,78** |
| **M4** | **0,70** | 20 | 5 | 63200 | **22,02** |
| **M4,5** | **0,75** | 20 | 7 | 77028 | **24,03** |
| MF5 | 0,50 | 20 | 5 | 77029 | **38,42** |
| **M5** | **0,80** | 20 | 7 | 63203 | **22,02** |
| MF6 | 0,50 | 20 | 5 | 77034 | **38,42** |
| MF6 | 0,75 | 20 | 7 | 77035 | **34,51** |
| **M6** | **1,00** | 20 | 7 | 63206 | **22,02** |
| MF7 | 0,75 | 25 | 9 | 77037 | **24,32** |
| **M7** | **1,00** | 25 | 9 | 63209 | **24,03** |
| MF8 | 0,50 | 25 | 9 | 77038 | **37,41** |
| MF8 | 0,75 | 25 | 9 | 77039 | **37,41** |
| MF8 | 1,00 | 25 | 9 | 63212 | **37,41** |
| **M8** | **1,25** | 25 | 9 | 63215 | **24,03** |
| MF9 | 1,00 | 25 | 9 | 77041 | **41,62** |
| **M9** | **1,25** | 25 | 9 | 63218 | **32,01** |
| MF10 | 0,75 | 30 | 11 | 77043 | **58,21** |
| MF10 | 1,00 | 30 | 11 | 63221 | **45,75** |
| MF10 | 1,25 | 30 | 11 | 63224 | **49,65** |
| **M10** | **1,50** | 30 | 11 | 63227 | **32,01** |
| MF11 | 1,00 | 30 | 11 | 77045 | **56,93** |
| MF11 | 1,25 | 30 | 11 | 77046 | **62,08** |
| **M11** | **1,50** | 30 | 11 | 63230 | **42,02** |
| MF12 | 1,00 | 38 | 10 | 63233 | **57,89** |
| MF12 | 1,25 | 38 | 10 | 63236 | **57,89** |
| MF12 | 1,50 | 38 | 10 | 63239 | **51,75** |
| **M12** | **1,75** | 38 | 14 | 63242 | **34,01** |
| MF13 | 1,00 | 38 | 10 | 77049 | **48,47** |
| MF13 | 1,50 | 38 | 10 | 77050 | **50,96** |
| MF14 | 1,00 | 38 | 10 | 63251 | **59,39** |
| MF14 | 1,25 | 38 | 10 | 63254 | **63,26** |
| MF14 | 1,50 | 38 | 10 | 63257 | **54,09** |
| **M14** | **2,00** | 38 | 14 | 63260 | **34,01** |
| MF15 | 1,00 | 38 | 10 | 75307 | **55,13** |
| MF15 | 1,50 | 38 | 10 | 77053 | **74,14** |
| MF16 | 1,00 | 45 | 14 | 63266 | **80,33** |
| MF16 | 1,25 | 45 | 14 | 77054 | **52,00** |
| MF16 | 1,50 | 45 | 14 | 63269 | **74,28** |
| **M16** | **2,00** | 45 | 18 | 63272 | **46,01** |
| MF18 | 1,00 | 45 | 14 | 77057 | **84,01** |
| MF18 | 1,25 | 45 | 14 | 77058 | **67,99** |
| MF18 | 1,50 | 45 | 14 | 63278 | **74,28** |
| MF18 | 2,00 | 45 | 14 | 63281 | **84,01** |
| **M18** | **2,50** | 45 | 18 | 63284 | **46,01** |
| MF20 | 1,00 | 45 | 14 | 77061 | **83,64** |
| MF20 | 1,50 | 45 | 14 | 63287 | **76,66** |
| MF20 | 2,00 | 45 | 14 | 63290 | **84,23** |

| M/MF | P | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **M20** | **2,50** | 45 | 18 | 63293 | **46,01** |
| MF22 | 1,00 | 55 | 16 | 77066 | **114,22** |
| MF22 | 1,50 | 55 | 16 | 63296 | **98,28** |
| MF22 | 2,00 | 55 | 16 | 63299 | **109,32** |
| **M22** | **2,50** | 55 | 22 | 63302 | **68,04** |
| MF24 | 1,00 | 55 | 16 | 77069 | **109,32** |
| MF24 | 1,50 | 55 | 16 | 77070 | **98,28** |
| MF24 | 2,00 | 55 | 16 | 63308 | **109,33** |
| **M24** | **3,00** | 55 | 22 | 63311 | **68,04** |
| MF25 | 1,00 | 55 | 16 | 77072 | **147,34** |
| MF25 | 1,50 | 55 | 16 | 77073 | **133,57** |
| MF26 | 1,00 | 55 | 16 | 77075 | **159,51** |
| MF26 | 1,50 | 55 | 16 | 77076 | **135,15** |
| MF27 | 1,00 | 65 | 18 | 70103 | **117,21** |
| MF27 | 1,50 | 65 | 18 | 77656 | **148,59** |
| MF27 | 2,00 | 65 | 18 | 77079 | **161,62** |
| **M27** | **3,00** | 65 | 25 | 63314 | **102,04** |
| MF28 | 1,50 | 65 | 18 | 77081 | **105,80** |
| MF30 | 1,00 | 65 | 18 | 77082 | **124,23** |
| MF30 | 1,50 | 65 | 18 | 77083 | **148,55** |
| MF30 | 2,00 | 65 | 18 | 75310 | **165,91** |
| **M30** | **3,50** | 65 | 25 | 63317 | **102,04** |
| MF32 | 1,50 | 65 | 18 | 77085 | **157,01** |
| MF33 | 1,50 | 65 | 18 | 77088 | **148,59** |
| MF33 | 2,00 | 65 | 18 | 77089 | **115,21** |
| **M33** | **3,50** | 65 | 25 | 77090 | **106,06** |
| MF35 | 1,50 | 65 | 18 | 77093 | **160,79** |
| MF36 | 1,50 | 65 | 18 | 75311 | **152,19** |
| MF36 | 2,00 | 65 | 18 | 77095 | **161,79** |
| MF36 | 3,00 | 65 | 25 | 77096 | **123,85** |
| **M36** | **4,00** | 65 | 25 | 77097 | **106,06** |
| New! MF39 | 1,50 | 75 | 20 | 84227 | **172,80** |
| New! MF39 | 2,00 | 75 | 20 | 84228 | **182,47** |
| New! MF39 | 3,00 | 75 | 30 | 84229 | **207,36** |
| **M39** | **4,00** | 75 | 30 | 77103 | **162,05** |
| MF40 | 1,50 | 75 | 20 | 77104 | **240,13** |
| MF40 | 2,00 | 75 | 20 | 77105 | **173,95** |
| MF40 | 3,00 | 75 | 30 | 70104 | **189,73** |
| MF42 | 2,00 | 75 | 20 | 77108 | **257,68** |
| MF42 | 3,00 | 75 | 30 | 70106 | **239,49** |
| **M42** | **4,50** | 75 | 30 | 77110 | **162,05** |
| MF45 | 1,50 | 90 | 22 | 77112 | **315,76** |
| MF45 | 2,00 | 90 | 22 | 77113 | **266,48** |
| MF45 | 3,00 | 90 | 36 | 77114 | **278,02** |
| **M45** | **4,50** | 90 | 36 | 77115 | **254,09** |
| MF48 | 1,50 | 90 | 22 | 70107 | **239,90** |
| MF48 | 3,00 | 90 | 36 | 35159 | **251,32** |
| **M48** | **5,00** | 90 | 36 | 77119 | **254,09** |
| MF50 | 1,50 | 90 | 22 | 77120 | **315,76** |
| MF52 | 1,50 | 90 | 22 | 77121 | **315,76** |
| **M52** | **5,00** | 90 | 36 | 77124 | **254,09** |

# Ref. 3500

## COJINETE MANO MÉTRICA / MÉTRICA FINA
Metric / Metric Fine Hand Die
Filière â main métrique / métrique pas fin

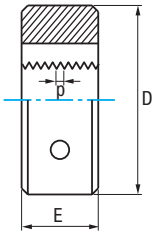
**7 Pcs**

| Cont. | N° Art. HSS | € |
|---|---|---|
| **Cojinetes / Dies / Filières DIN 223: M3-M4-M5-M6-M8-M10-M12** | 56518 | **178,13** |

# Ref. 3501

## COJINETE MANO MÉTRICA CORTE IZQUIERDA
Left Cutting Metric Hand Die
Filière à main métrique coupe à gauche

HSS | DIN 223 | Tol. 6g | α 10 - 17° | L

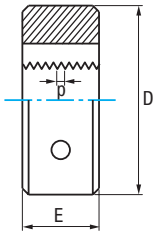



**Chaflán Entrada 1,75h**
**Chamfer 1,75 threads**
Chanfrein 1,75 filets

| M | P | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **M2** | 0,40 | 16 | 5 | 59875 | **52,05** |
| **M3** | 0,50 | 20 | 5 | 23318 | **44,01** |
| **M4** | 0,70 | 20 | 5 | 23319 | **44,01** |
| **M5** | 0,80 | 20 | 7 | 23320 | **44,01** |
| **M6** | 1,00 | 20 | 7 | 23321 | **44,01** |
| **M7** | 1,00 | 25 | 9 | 11007 | **48,05** |
| **M8** | 1,00 | 25 | 9 | 10941 | **74,82** |
| **M8** | 1,25 | 25 | 9 | 23322 | **48,03** |
| **M10** | 1,50 | 30 | 11 | 23323 | **64,04** |
| **M11** | 1,50 | 30 | 11 | 59876 | **84,07** |
| **M12** | 1,75 | 38 | 14 | 23324 | **68,04** |
| **M14** | 2,00 | 38 | 14 | 23325 | **68,04** |
| **M16** | 2,00 | 45 | 18 | 23326 | **92,03** |
| **M18** | 2,50 | 45 | 18 | 23327 | **92,03** |
| **M20** | 2,50 | 45 | 18 | 23328 | **92,03** |

# Ref. 3510

## COJINETE MANO MÉTRICA ISO
ISO Metric Hand Die
Filière à main métrique ISO




HSS | ISO 529 | Tol. 6g | α 10 - 17° | **Ajustable** BS 1127 A Adjustable | **Forma** A Form

| M | P | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **M3** | 0,50 | **25,4** | 9,5 | 38230 | **8,50** |
| **M4** | 0,70 | **25,4** | 9,5 | 38231 | **8,50** |
| **M5** | 0,80 | **25,4** | 9,5 | 38232 | **8,50** |
| **M6** | 1,00 | **25,4** | 9,5 | 38233 | **8,50** |
| **M7** | 1,00 | **25,4** | 9,5 | 38234 | **9,96** |
| **M8** | 1,25 | **25,4** | 9,5 | 38235 | **8,97** |
| **M10** | 1,50 | **25,4** | 9,5 | 38237 | **11,43** |
| **M12** | 1,75 | **25,4** | 9,5 | 38238 | **11,43** |

| M | P | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **M8** | 1,25 | **38,1** | 12,7 | 38239 | **26,58** |
| **M10** | 1,50 | **38,1** | 12,7 | 38240 | **27,70** |
| **M12** | 1,75 | **38,1** | 12,7 | 38242 | **27,70** |
| **M14** | 2,00 | **38,1** | 12,7 | 38243 | **27,70** |
| **M16** | 2,00 | **38,1** | 12,7 | 38244 | **27,70** |
| **M18** | 2,50 | **38,1** | 12,7 | 38245 | **40,97** |
| **M20** | 2,50 | **38,1** | 12,7 | 38246 | **40,97** |

| M | P | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **M18** | 2,50 | **50,8** | 15,9 | 38250 | **49,83** |
| **M20** | 2,50 | **50,8** | 15,9 | 38251 | **49,83** |
| **M22** | 2,50 | **50,8** | 15,9 | 38252 | **49,83** |
| **M24** | 3,00 | **50,8** | 15,9 | 38253 | **52,05** |

# COJINETES HEXAGONALES
## Hexagon Die Nuts
## Filières hexagonales

**Los cojinetes hexagonales se utilizan para trabajos de montaje y repasado de roscas con resistencia a la tracción baja y media. Las medidas clave estandarizadas del hexágono permiten el uso de llaves ajustables y llaves fijas como herramientas de trabajo.**

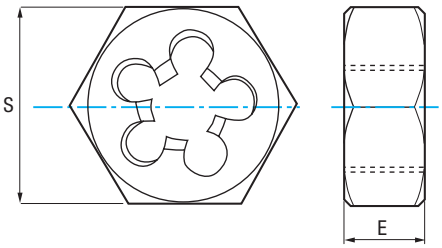
**Hexagon Die Nuts are used for assembly works and re-cutting of threads with low and medium tensile strength. The standardized key metrics of the hexagon enable the usage of ring wrenches and open-end wrenches as operating tools.**

Les filières hexagonales sont utilisées pour les travaux hors atelier et pour retoucher des filetages avec une résistance à la traction faible/moyenne. Les mesures entre les faces de l'hexagone permettent l'utilisation de clés réglables et de clés fixes standard comme outils de serrage.

# Ref. 3560

## COJINETE MANO HEXAGONAL MÉTRICA / MÉTRICA FINA
Metric / Metric Fine HEX Hand Die
Filière â main hexagonale métrique / métrique pas fin

New!




HSS | DIN 382 | Tol. 6g

| M/MF | P | S mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| MF3 | 0,35 | 19 | 5 | 84244 | **36,48** |
| **M3** | **0,50** | 19 | 5 | 84245 | **22,45** |
| **M3,5** | **0,60** | 19 | 5 | 84246 | **26,51** |
| MF4 | 0,50 | 19 | 5 | 84247 | **36,48** |
| **M4** | **0,70** | 19 | 5 | 84248 | **22,45** |
| **M4,5** | **0,75** | 19 | 7 | 84249 | **24,50** |
| MF5 | 0,50 | 19 | 7 | 84250 | **39,17** |
| **M5** | **0,80** | 19 | 7 | 84251 | **22,45** |
| MF6 | 0,75 | 19 | 7 | 84252 | **39,17** |
| **M6** | **1,00** | 19 | 7 | 84253 | **22,45** |
| MF7 | 0,75 | 22 | 9 | 84254 | **24,79** |
| **M7** | **1,00** | 22 | 9 | 84255 | **24,50** |
| MF8 | 0,75 | 22 | 9 | 84256 | **38,03** |
| MF8 | 1,00 | 22 | 9 | 84259 | **38,03** |
| **M8** | **1,25** | 22 | 9 | 84260 | **24,50** |
| MF9 | 1,00 | 22 | 9 | 84261 | **42,43** |
| **M9** | **1,25** | 22 | 9 | 84262 | **32,63** |
| MF10 | 1,00 | 27 | 11 | 84263 | **46,64** |
| **M10** | **1,50** | 27 | 11 | 84264 | **32,63** |
| MF11 | 1,00 | 27 | 11 | 84266 | **58,03** |
| **M11** | **1,50** | 27 | 11 | 84267 | **42,84** |
| MF12 | 1,00 | 36 | 10 | 84268 | **52,75** |
| MF12 | 1,25 | 36 | 10 | 84269 | **59,01** |
| MF12 | 1,50 | 36 | 10 | 84270 | **59,01** |
| **M12** | **1,75** | 36 | 14 | 84271 | **34,67** |
| MF14 | 1,00 | 36 | 10 | 84272 | **55,14** |
| MF14 | 1,25 | 36 | 10 | 84273 | **64,49** |
| MF14 | 1,50 | 36 | 10 | 84274 | **60,54** |
| **M14** | **2,00** | 36 | 14 | 84275 | **34,67** |
| MF16 | 1,50 | 41 | 14 | 84276 | **75,73** |

| M/MF | P | S mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **M16** | **2,00** | 41 | 18 | 84277 | **46,90** |
| MF18 | 1,50 | 41 | 14 | 84278 | **75,73** |
| MF18 | 2,00 | 41 | 14 | 84279 | **85,64** |
| **M18** | **2,50** | 41 | 18 | 84281 | **46,90** |
| MF20 | 1,50 | 41 | 14 | 84283 | **78,15** |
| MF20 | 2,00 | 41 | 14 | 84282 | **85,26** |
| **M20** | **2,50** | 41 | 18 | 84284 | **46,90** |
| MF22 | 1,50 | 50 | 16 | 84285 | **100,19** |
| MF22 | 2,00 | 50 | 16 | 84286 | **111,45** |
| **M22** | **2,50** | 50 | 16 | 84287 | **69,36** |
| MF24 | 1,50 | 50 | 16 | 84288 | **100,19** |
| MF24 | 2,00 | 50 | 16 | 84289 | **111,46** |
| **M24** | **3,00** | 50 | 22 | 84290 | **69,36** |
| MF26 | 1,50 | 60 | 18 | 84291 | **137,77** |
| MF27 | 1,50 | 60 | 18 | 84292 | **151,47** |
| MF27 | 2,00 | 60 | 18 | 84293 | **164,76** |
| **M27** | **3,00** | 60 | 25 | 84294 | **104,02** |
| MF28 | 1,50 | 60 | 18 | 84295 | **107,86** |
| MF30 | 1,50 | 60 | 18 | 84296 | **151,43** |
| MF30 | 2,00 | 60 | 18 | 84297 | **169,13** |
| **M30** | **3,50** | 60 | 25 | 84298 | **104,02** |
| MF32 | 1,50 | 60 | 18 | 84299 | **160,06** |
| MF33 | 1,50 | 60 | 18 | 84300 | **151,47** |
| MF33 | 2,00 | 60 | 18 | 84301 | **117,44** |
| **M33** | **3,50** | 60 | 25 | 84302 | **108,12** |
| MF35 | 1,50 | 60 | 18 | 84303 | **163,92** |
| MF36 | 1,50 | 60 | 18 | 84304 | **155,15** |
| MF36 | 2,00 | 60 | 18 | 84305 | **164,93** |
| MF36 | 3,00 | 60 | 18 | 84306 | **126,25** |
| **M36** | **4,00** | 60 | 25 | 84307 | **108,12** |

- **Para uso con llave fija, ajustable o de vaso**
- **Ideal para espacios limitados**
- **Recomendado para repasar roscas**
- **For use with a fixed, extendable, or socket wrench**
- **Ideal for tight spaces**
- **Recommended for rethreading threads**
- Pour une utilisation avec une clé fixe, une clé extensible ou à douille
- Idéal pour les espaces restreints
- Recommandé pour réparer les filetages

# Ref. 3534

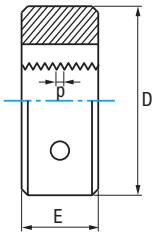
## COJINETE MANO UNC
UNC Hand Die
Filière à main UNC

HSS | DIN 223 | α 10 - 17° | Tol. 2A

60°

**Estándar americano para rosca gruesa**
**U.S standard for coarse thread**
Norme américaine pour le filetage grossier

**Chaflán Entrada 1,75h**
**Chamfer 1,75 threads**
Chanfrein 1,75 filets




| UNC | Hilos Threads Filets | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **UNC 1/4** | **20** | 20 | 7 | 75557 | **33,65** |
| **UNC 5/16** | **18** | 25 | 9 | 75561 | **35,20** |
| **UNC 3/8** | **16** | 30 | 11 | 75559 | **51,82** |
| **UNC 7/16** | **14** | 30 | 11 | 75563 | **51,82** |
| **UNC 1/2** | **13** | 38 | 14 | 75556 | **53,37** |
| **UNC 9/16** | **12** | 38 | 14 | 75564 | **55,85** |
| **UNC 5/8** | **11** | 45 | 18 | 75560 | **73,31** |
| **UNC 3/4** | **10** | 45 | 18 | 75558 | **73,31** |
| **UNC 7/8** | **9** | 55 | 22 | 75562 | **95,84** |
| **UNC 1"** | **8** | 55 | 22 | 75565 | **95,84** |

# Ref. 3504

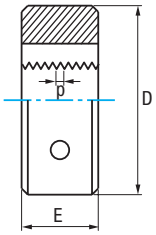
## COJINETE MANO UNF
UNF Hand Die
Filière à main UNF

HSS | DIN 223 | Tol. 2A | α 10 - 17°

60°

**Estándar americano para rosca fina**
**U.S. standard for fine thread**
Norme américaine pour le filetage fin

**Chaflán Entrada 1,75h**
**Chamfer 1,75 threads**
Chanfrein 1,75 filets




| UNF | Hilos Threads Filets | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **UNF N°4** | **48** | 16 | 5 | 75688 | **32,18** |
| **UNF N°5** | **44** | 20 | 5 | 75689 | **32,18** |
| **UNF N°6** | **40** | 20 | 7 | 75690 | **32,18** |
| **UNF N°8** | **36** | 20 | 7 | 75691 | **32,18** |
| **UNF N°10** | **32** | 20 | 7 | 75692 | **32,18** |
| **UNF N°12** | **28** | 20 | 7 | 75693 | **32,18** |
| **UNF 1/4** | **28** | 20 | 7 | 63422 | **32,18** |
| **UNF 5/16** | **24** | 25 | 9 | 63434 | **35,20** |
| **UNF 3/8** | **24** | 30 | 11 | 63428 | **49,40** |
| **UNF 7/16** | **20** | 30 | 11 | 63440 | **49,40** |
| **UNF 1/2** | **20** | 38 | 10 | 63419 | **51,82** |
| **UNF 9/16** | **18** | 38 | 10 | 75747 | **55,85** |
| **UNF 5/8** | **18** | 45 | 14 | 63431 | **71,39** |
| **UNF 3/4** | **16** | 45 | 14 | 63425 | **71,39** |
| **UNF 7/8** | **14** | 55 | 16 | 63437 | **95,84** |

Ref. 3534

Ref. 3504

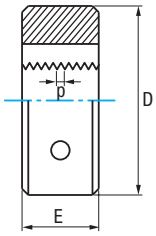
# Ref. 3505

## COJINETE MANO UNEF
UNEF Hand Die
Filière à main UNEF

HSS | DIN 22568 | Tol. 2A | α 10 - 17°

60° **Estándar americano para rosca extra fina**
**U.S. standard for extra fine thread**
Norme américaine pour le filetage extra fin

**Chaflán Entrada 1,75h**
**Chamfer 1,75 threads**
Chanfrein 1,75 filets




| UNEF | Hilos Threads Filets | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **UNEF 1/4** | **32** | 20 | 7 | 38275 | **71,26** |
| **UNEF 5/16** | **32** | 25 | 9 | 38279 | **71,26** |
| **UNEF 3/8** | **32** | 30 | 11 | 38277 | **110,66** |
| **UNEF 7/16** | **28** | 30 | 11 | 38280 | **110,66** |
| **UNEF 1/2** | **28** | 38 | 10 | 38274 | **110,66** |
| **UNEF 9/16** | **24** | 38 | 10 | 15217 | **110,66** |
| **UNEF 5/8** | **24** | 45 | 14 | 38278 | **177,32** |
| **UNEF 3/4** | **20** | 45 | 14 | 38276 | **177,32** |
| **UNEF 1"** | **20** | 55 | 16 | 38281 | **216,75** |

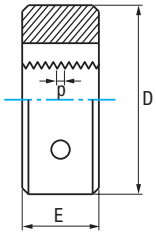
# Ref. 3507

## COJINETE MANO NPT
NPT Hand Die
Filière à main NPT

HSS | DIN 223 B | α 10 - 17°

60° **Estándar americano para tubos y acoples**
**U.S. standard thread for sealing pipes and fittings**
Norme américaine pour les tuyaux et les raccords

**Chaflán Entrada 1,75h**
**Chamfer 1,75 threads**
Chanfrein 1,75 filets




| NPT | Hilos Threads Filets | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **NPT 1/8** | **27,00** | 30 | 11 | 76043 | **59,84** |
| **NPT 1/4** | **18,00** | 38 | 14 | 77707 | **59,84** |
| **NPT 3/8** | **18,00** | 45 | 18 | 22395 | **78,01** |
| **NPT 1/2** | **14,00** | 45 | 18 | 45894 | **78,01** |
| **NPT 3/4** | **14,00** | 55 | 22 | 76052 | **142,66** |
| **NPT 1"** | **11,50** | 65 | 25 | 63476 | **171,54** |
| **NPT 1"1/4** | **11,50** | 75 | 26 | 22456 | **213,13** |
| **NPT 1"1/2** | **11,50** | 90 | 27 | 22460 | **297,36** |
| **NPT 2"** | **11,50** | 105 | 28 | 22475 | **413,97** |

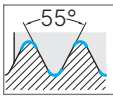
Ref. 3505

Ref. 3507

# Ref. 3502

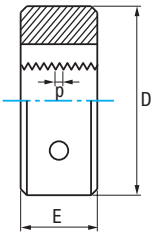
## COJINETE MANO BSW (WHITWORTH)
BSW (Whitworth) Hand Die
Filiere a main BSW (Whitworth)

HSS | DIN 223 | α 10 - 17°




**Estándar británico para rosca gruesa**
**British standard for coarse thread**
Norme britannique pour le filetage grossier

**Chaflán Entrada 1,75h**
**Chamfer 1,75 threads**
Chanfrein 1,75 filets




| W | Hilos Threads Filets | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **W3/32** | **48** | 16 | 5 | 63344 | **35,74** |
| **W1/8** | **40** | 20 | 5 | 63329 | **28,87** |
| **W5/32** | **32** | 20 | 7 | 63356 | **30,07** |
| **W3/16** | **24** | 20 | 7 | 63341 | **30,07** |
| **W7/32** | **24** | 20 | 7 | 63365 | **39,42** |
| **W1/4** | **20** | 20 | 7 | 63323 | **28,87** |
| **W5/16** | **18** | 25 | 9 | 63350 | **30,07** |
| **W3/8** | **16** | 30 | 11 | 63335 | **43,56** |
| **W7/16** | **14** | 30 | 11 | 63362 | **43,56** |
| **W1/2** | **12** | 38 | 14 | 63320 | **43,56** |
| **W9/16** | **12** | 38 | 14 | 63368 | **52,16** |
| **W5/8** | **11** | 45 | 18 | 63347 | **63,37** |
| **W3/4** | **10** | 45 | 18 | 63332 | **63,37** |
| **W7/8** | **9** | 55 | 22 | 63359 | **93,18** |
| **W1”** | **8** | 55 | 22 | 63374 | **93,18** |
| **W1” 1/8** | **7** | 65 | 25 | 63383 | **146,66** |

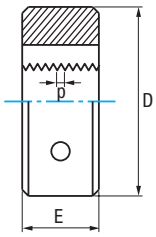
# Ref. 3546

## COJINETE MANO BSP (GAS) INOX
Stainless BSP (Gas) Hand Die
Filière à main BSP (Gaz) Inox

HSSE 5%Co | DIN 24231 | Tol. A | α 20° | **Vaporizado** Vaporized Vaporisée

**Chaflán Entrada 2,25h**
**Chamfer 2,25 threads**
Chanfrein 2,25 filets

55° **Rosca británica para tubo paralelo (BSPP-GAS)**
British Standard Parallel Pipe (BSPP-GAS)
Filetage britannique pour tuyau parallèle (BSPP-GAS)




**Grupo Group-Groupe P** **Grupo Group-Groupe M**

| G | Hilos Threads Filets | D mm | E mm | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **G1/8** | **28** | 30 | 11 | 81341 | **41,93** |
| **G1/4** | **19** | 38 | 10 | 81342 | **41,93** |
| **G3/8** | **19** | 45 | 14 | 81343 | **56,95** |
| **G1/2** | **14** | 45 | 14 | 81344 | **56,95** |
| **G3/4** | **14** | 55 | 16 | 81345 | **111,90** |
| **G1"** | **11** | 65 | 18 | 81346 | **171,02** |

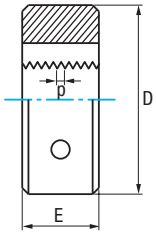
# Ref. 3506

## COJINETE MANO BSP (GAS)
BSP (Gas) Hand Die
Filière à main BSP (Gaz)

HSS | DIN 24231 | Tol. A | α 10 - 17°

**Chaflán Entrada 1,75h**
**Chamfer 1,75 threads**
Chanfrein 1,75 filets

55° **Rosca británica para tubo paralelo (BSPP-GAS)**
British Standard Parallel Pipe (BSPP-GAS)
Filetage britannique pour tuyau parallèle (BSPP-GAS)



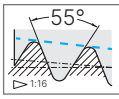

| | G | Hilos Threads Filets | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| | **G1/8** | **28** | 30 | 11 | 63461 | **38,12** |
| | **G1/4** | **19** | 38 | 10 | 63455 | **38,12** |
| | **G3/8** | **19** | 45 | 14 | 63467 | **49,30** |
| | **G1/2** | **14** | 45 | 14 | 63452 | **49,30** |
| | **G5/8** | **14** | 55 | 16 | 75496 | **75,23** |
| | **G3/4** | **14** | 55 | 16 | 63464 | **102,18** |
| | **G7/8** | **14** | 65 | 18 | 76252 | **106,96** |
| | **G1"** | **11** | 65 | 18 | 63470 | **106,96** |
| | **G1" 1/8** | **11** | 75 | 20 | 76202 | **195,90** |
| | **G1" 1/4** | **11** | 75 | 20 | 76210 | **195,90** |
| | **G1" 1/2** | **11** | 90 | 22 | 76224 | **195,90** |
| New! | **G1" 3/4** | **11** | 105 | 22 | 76230 | **201,59** |
| New! | **G2"** | **11** | 105 | 22 | 76236 | **242,61** |

# Ref. 3519

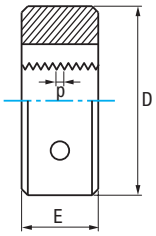
## COJINETE MANO BSPT (RC)
BSPT (RC) Hand Die
Filière à main BSPT (RC)

HSS | DIN 24231 | α 10 - 17°

**Chaflán Entrada 1,75h**
**Chamfer 1,75 threads**
Chanfrein 1,75 filets




**Rosca británica para tubo cónica**
British Standard Pipe Taper
Raccord BSPT



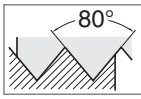

| BSPT | Hilos Threads Filets | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **BSPT 1/8** | **28** | 30 | 11 | 38263 | **69,71** |
| **BSPT 1/4** | **19** | 38 | 14 | 38262 | **69,71** |
| **BSPT 3/8** | **19** | 45 | 18 | 38265 | **90,78** |
| **BSPT 1/2** | **14** | 55 | 22 | 38261 | **90,78** |
| **BSPT 5/8** | **14** | 55 | 22 | 38266 | **174,94** |
| **BSPT 3/4** | **14** | 55 | 22 | 38264 | **171,41** |
| **BSPT 7/8** | **14** | 65 | 22 | 38267 | **228,31** |
| **BSPT 1"** | **11** | 65 | 25 | 38268 | **182,66** |

# Ref. 3509

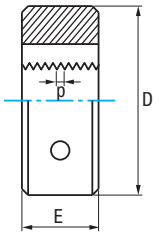
## COJINETE MANO PG
PG Hand Die
Filière à main PG

HSS | DIN 40434 | α 10 - 17°

**Chaflán Entrada 1,75h**
**Chamfer 1,75 threads**
Chanfrein 1,75 filets



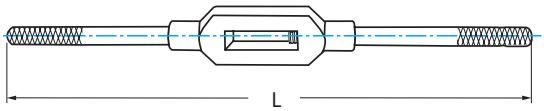

**Rosca para tubos eléctricos en acero**
**Steel Electric Pipe Thread**
Filetage tubes electriques en acier




| PG | Hilos Threads Filets | D mm | E mm | N° Art. HSS | € |
|---|---|---|---|---|---|
| **PG 07** | **20** | 38 | 10 | 38301 | **42,33** |
| **PG 09** | **18** | 45 | 14 | 38302 | **42,33** |
| **PG 11** | **18** | 45 | 14 | 38303 | **53,02** |
| **PG 13,50** | **18** | 45 | 14 | 38304 | **53,02** |
| **PG 16** | **18** | 55 | 16 | 38305 | **68,36** |
| **PG 21** | **16** | 65 | 18 | 38306 | **97,15** |
| **PG 29** | **16** | 65 | 18 | 38307 | **97,15** |
| **PG 36** | **16** | 90 | 22 | 38308 | **248,98** |
| **PG 42** | **16** | 105 | 22 | 38309 | **248,98** |
| **PG 48** | **16** | 105 | 22 | 38310 | **330,20** |

# Ref. 3191

**GIRA-MACHOS**
Tap Wrench
Porte-taraud



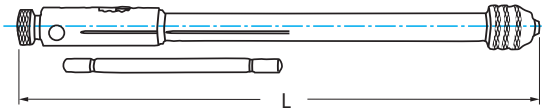

DIN 1814

| | Mod. | Uso Use Usage | L mm | Cuadradillo Square / Carré mm | Nº Art. | € |
|---|---|---|---|---|---|---|
| | **000** | **M1-M8** | 125 | 2,10-4,90 | 69826 | **15,59** |
| | **010** | **M1-M10** | 180 | 2,10-5,50 | 69828 | **16,29** |
| | **015** | **M1-M12** | 200 | 2,10-7,00 | 69829 | **17,78** |
| | **020** | **M4-M12** | 280 | 3,40-7,00 | 69831 | **22,73** |
| | **030** | **M5-M20** | 375 | 4,90-12,00 | 69832 | **31,77** |
| | **040** | **M11-M27** | 500 | 6,20-16,00 | 69834 | **50,38** |
| | **050** | **M13-M32** | 750 | 7,00-20,00 | 69835 | **104,24** |
| | *** 060** | **M18-M42** | 870 | 7,00-28,00 | 83111 | **119,30** |
| | *** 070** | **M25-M52** | 1250 | 16,00-32,00 | 26694 | **200,48** |
| New! | *** 080** | **M25-M75** | 1015 | 14,50-40,00 | 24537 | **213,27** |

*** Acero** / **Steel** / Acier

# Ref. 3912

## GIRA-MACHOS CRIQUÉ
Tap Wrench
Porte-taraud



"T" + Criqué

| Mod. | M | L mm | Cap. mm | Nº Art. | € |
|---|---|---|---|---|---|
| **01** | **M3-M10** | **85** | 2,4-5,5 | 25340 | **23,05** |
| **02** | **M5-M12** | **100** | 4,5-8,0 | 25341 | **31,31** |
| **10** | **M3-M10** | **250** | 2,4-5,5 | 25342 | **36,35** |
| **20** | **M5-M12** | **300** | 4,5-8,0 | 25343 | **43,35** |

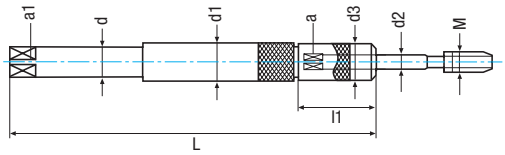
# Ref. 3900

## GALGA
Pitch Gauge
Jauge

| Cap. M | Cap. W | N° Art. | € |
|---|---|---|---|
| 0,25-6,00 | 4G-62G | 44612 | **8,13** |
| 0,40-6,00 | | 67641 | **3,14** |

# Ref. 3194

## ALARGADOR MACHOS MÁQUINA
Machine Tap Extension
Rallonge tarauds machine



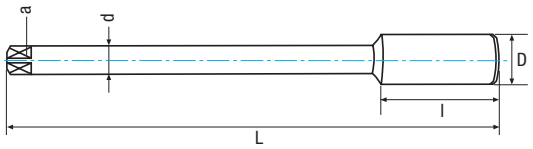

CNC

**Apto para escariadores**
**Suitable for Reamers**
Conseillé pour alésoirs

| M 371 | M 376 | d2 mm | a mm | d1 mm | d = d3 mm | a1 mm | L mm | l1 mm | N° Art. | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **M2-M2,6** | **M4** | 2,80 | 2,10 | 6,10 | 6 | 4,90 | **130** | 22 | 10784 | **167,71** |
| **M3** | **M4,5-M5** | 3,50 | 2,70 | 7,50 | 6 | 4,90 | **130** | 23 | 11299 | **167,71** |
| **M4** | **M6** | 4,50 | 3,40 | 8,40 | 6 | 4,90 | **130** | 23 | 11794 | **192,89** |
| **M4,5-M6** | **M8** | 6,00 | 4,90 | 12,10 | 7 | 5,50 | **130** | 26 | 11832 | **192,89** |
| **M7** | **M9-M10** | 7,00 | 5,50 | 12,10 | 7 | 5,50 | **130** | 26 | 11875 | **196,74** |
| **M8** | **M11** | 8,00 | 6,20 | 13,00 | 8 | 6,20 | **130** | 30 | 12092 | **198,71** |
| **M9** | **M12** | 9,00 | 7,00 | 15,00 | 9 | 7,00 | **130** | 31 | 12104 | **198,71** |
| **M10** | | 10,00 | 8,00 | 15,00 | 10 | 8,00 | **130** | 33 | 12107 | **198,71** |
| | **M14** | 11,00 | 9,00 | 18,00 | 11 | 9,00 | **130** | 36 | 12113 | **214,60** |
| | **M16** | 12,00 | 9,00 | 18,00 | 12 | 9,00 | **130** | 36 | 12116 | **214,60** |
| | | | | | | | | | | |
| **M2-M2,6** | **M4** | 2,80 | 2,10 | 6,10 | 6 | 4,90 | **230** | 22 | 12122 | **182,27** |
| **M3** | **M4,5-M5** | 3,50 | 2,70 | 7,50 | 6 | 4,90 | **230** | 23 | 12125 | **182,27** |
| **M4** | **M6** | 4,50 | 3,40 | 8,40 | 6 | 4,90 | **230** | 23 | 12128 | **209,61** |
| **M4,5-M6** | **M8** | 6,00 | 4,90 | 12,10 | 7 | 5,50 | **230** | 26 | 12137 | **209,61** |
| **M7** | **M9-M10** | 7,00 | 5,50 | 12,10 | 7 | 5,50 | **230** | 26 | 12140 | **213,80** |
| **M8** | **M11** | 8,00 | 6,20 | 13,00 | 8 | 6,20 | **230** | 30 | 12143 | **215,95** |
| **M9** | **M12** | 9,00 | 7,00 | 15,00 | 9 | 7,00 | **230** | 31 | 12174 | **215,95** |
| **M10** | | 10,00 | 8,00 | 15,00 | 10 | 8,00 | **230** | 33 | 12177 | **215,95** |
| | **M14** | 11,00 | 9,00 | 18,00 | 11 | 9,00 | **230** | 36 | 12180 | **233,20** |
| | **M16** | 12,00 | 9,00 | 18,00 | 12 | 9,00 | **230** | 36 | 12183 | **233,20** |

# Ref. 3190

## ALARGADOR MACHOS MANO
Hand Tap Extension
Rallonge tarauds à main

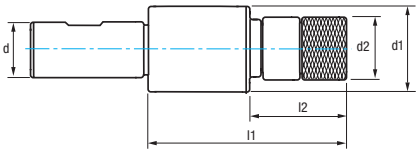



DIN 377

| M | W | G | D mm | d mm | L mm | l mm | a mm | N° Art. | € |
|---|---|---|---|---|---|---|---|---|---|
| **M1-M2,6** | 1/16-3/32 | | 5 | 2,8 | 60 | 15 | 2,10 | 12994 | **7,64** |
| **M3** | 1/8 | | 7 | 3,5 | 80 | 20 | 2,70 | 12997 | **7,64** |
| **M3,5** | | | 7 | 4 | 90 | 20 | 3,00 | 12999 | **7,64** |
| **M4** | 5/32 | | 8 | 4,5 | 95 | 22 | 3,40 | 13003 | **8,15** |
| **M4,5** | 3/16 | | 9 | 5 | 100 | 23 | 3,80 | 13006 | **8,15** |
| **M5-M8** | 7/32-5/16 | | 11 | 6 | 110 | 25 | 4,90 | 13024 | **8,73** |
| **M9-M10** | 3/8 | 1/8 | 12 | 7 | 115 | 27 | 5,50 | 13026 | **8,87** |
| **M11** | 7/16 | | 14 | 8 | 120 | 29 | 6,20 | 13009 | **11,08** |
| **M12** | 1/2 | | 15 | 9 | 125 | 31 | 7,00 | 13012 | **11,58** |
| **M13-M16** | 9/16-5/8 | 1/4-3/8 | 19 | 12 | 130 | 33 | 9,00 | 13030 | **14,02** |
| **M18** | 11/16-3/4 | | 23 | 14 | 150 | 39 | 11,00 | 13015 | **18,41** |
| **M20** | 13/16 | 1/2 | 25 | 16 | 155 | 41 | 12,00 | 12448 | **19,55** |
| **M22-M26** | 7/8-15/16 | 5/8 | 29 | 18 | 175 | 47 | 14,50 | 12451 | **33,12** |
| **M27-M28** | 1" | 3/4 | 30 | 20 | 185 | 47 | 16,00 | 12457 | **35,79** |
| **M30-M32** | 1"1/8 | 7/8 | 33 | 22 | 195 | 48 | 18,00 | 12459 | **42,38** |
| **M33** | 1"1/4 | 1 | 36 | 25 | 220 | 52 | 20,00 | 12463 | **48,80** |
| **M34-M38** | 1"3/8 | 1"1/8 | 38 | 28 | 220 | 60 | 22,00 | 12465 | **65,81** |
| **M39-M42** | 1"1/2-1"5/8 | 1"1/4 | 42 | 32 | 235 | 63 | 24,00 | 12469 | **82,84** |
| **M45-M50** | 1"3/4-1"7/8 | 1"3/8-2" | 50 | 36 | 265 | 70 | 29,00 | 12472 | **126,16** |
| **M52** | 2" | 2"1/4 | 55 | 40 | 285 | 75 | 32,00 | 12475 | **163,66** |

# Ref. 3193

## PORTA-MACHOS COMPENSACIÓN RADIAL/AXIAL*
Radial/Axial Compensation Tap Holder*
Porte-tarauds compensation rayon / axe*




| Cap. | d1 mm | d2 mm | d mm | l1 mm | l2 mm | N° Art. | € |
|---|---|---|---|---|---|---|---|
| **M3-M12** | 45 | 29 | 20 | 96 | 44 | 20031 | **1.493,23** |

**Ref. 3193 bajo demanda / upon request /** sur demande

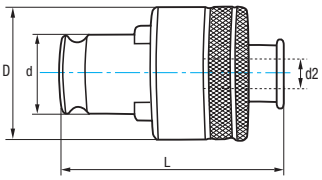
***Para evitar la rotura de machos en máquinas automáticas**

***For avoiding broken taps in automatic machines**

*Pour éviter les ruptures de tarauds sur machines automatiques

# Ref. 3195

## ADAPTADOR PORTA-MACHOS DE CAMBIO RÁPIDO CON EMBRAGUE
Quick Change Tap Collet with Safety Clutch
Adaptateur porte-tarauds changement rapide avec embrayage



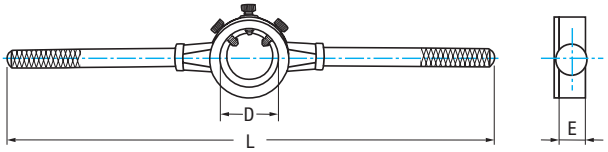
| | M DIN 371 | M DIN 376 | d2 mm | a1 mm | D mm | d mm | L mm | N° Art. | € |
|---|---|---|---|---|---|---|---|---|---|
| New! | **M2** | **M4** | 2,80 | 2,10 | 32,50 | 19 | 50 | 20122 | **49,46** |
| | **M3** | **M5** | 3,50 | 2,70 | 32,50 | 19 | 50 | 20183 | **49,46** |
| | **M4** | **M6** | 4,50 | 3,40 | 32,50 | 19 | 50 | 20185 | **49,46** |
| | **M4,5-M6** | **M8** | 6,00 | 4,90 | 32,50 | 19 | 50 | 20186 | **49,46** |
| | **M8** | **M11** | 8,00 | 6,20 | 32,50 | 19 | 50 | 20742 | **49,46** |
| | **M10** | | 10,00 | 8,00 | 32,50 | 19 | 50 | 21253 | **49,46** |
| | | **M12** | 9,00 | 7,00 | 32,50 | 19 | 50 | 21231 | **49,46** |
| New! | | **M14** | 11,00 | 9,00 | 32,50 | 19 | 50 | 84365 | **49,46** |
| New! | | **M16** | 12,00 | 9,00 | 32,50 | 19 | 50 | 84366 | **49,46** |

**Ref. 3195 bajo demanda / upon request /** sur demande

# Ref. 3181

## PORTA-COJINETES
Die Holder
Porte filières

**¡NUEVO MODELO MEJORADO!**
**New improved model!**
Nouveau modèle amélioré !



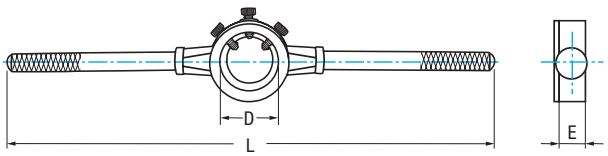

DIN 225

| Mod. | D mm | E mm | L mm | M/MF | W | G | N° Art. | € |
|---|---|---|---|---|---|---|---|---|
| **000** | 16 | 5 | 160 | **M1-M2,6** | W1/16-W3/32 | | 69792 | **8,72** |
| **010** | 20 | 5 | 200 | **M3-M4** | W1/8-W5/32 | | 69790 | **9,47** |
| **020** | 20 | 7 | 200 | **M4,5-M6** | W3/16-W1/4 | | 69798 | **9,47** |
| **030** | 25 | 9 | 224 | **M7-M9** | W5/16 | G1/16 | 69799 | **10,87** |
| **040** | 30 | 11 | 280 | **M10-M11** | W3/8-W7/16 | G1/8 | 69811 | **13,47** |
| **050** | 38 | 14 | 315 | **M12-M15** | W1/2-W9/16 | | 69813 | **17,10** |
| **060** | 38 | 10 | 315 | MF12-MF15 | | G1/4 | 69814 | **17,10** |
| **070** | 45 | 18 | 450 | **M16-M20** | W5/8-W3/4 | | 69816 | **21,16** |
| **080** | 45 | 14 | 450 | MF16-MF20 | | G3/8-G1/2 | 69817 | **21,16** |
| **090** | 55 | 22 | 560 | **M22-M24** | W7/8-W1 | | 69819 | **28,42** |
| **100** | 55 | 16 | 560 | MF21-MF26 | | G5/8-G3/4 | 69795 | **27,07** |
| **110** | 65 | 25 | 630 | **M27-M36** | W1 1/8 - W1 3/8 | | 69796 | **39,88** |
| **120** | 65 | 18 | 630 | MF27-MF36 | | G7/8-G1 | 30484 | **39,88** |
| *** 130** | 75 | 30 | 920 | **M39-M42** | W1 1/2 - W1 5/8 | | 32600 | **124,04** |
| *** 140** | 75 | 20 | 920 | MF38-MF42 | | G1 1/8 - G1 1/4 | 43515 | **124,04** |
| *** 150** | 90 | 36 | 950 | **M45-M52** | W1 3/4 - W2 | | 43516 | **180,77** |
| *** 160** | 90 | 22 | 950 | MF45-MF52 | | G1 1/2 | 43517 | **180,77** |

*** Acero** / **Steel** / Acier

# Ref. 3184

## PORTA-COJINETES ISO 529
ISO 529 Die Holder
Porte filières ISO 529




DIN 225

| D mm | E mm | M | W | N° Art. | € |
|---|---|---|---|---|---|
| **25,40** | 9,50 | **M3-M12** | W1/8-W1/2 | 43317 | **11,32** |
| **38,10** | 12,70 | **M8-M20** | W5/16-W3/4 | 43318 | **16,91** |
| **50,80** | 15,90 | **M18-M24** | W11/16-W1 | 43319 | **24,44** |

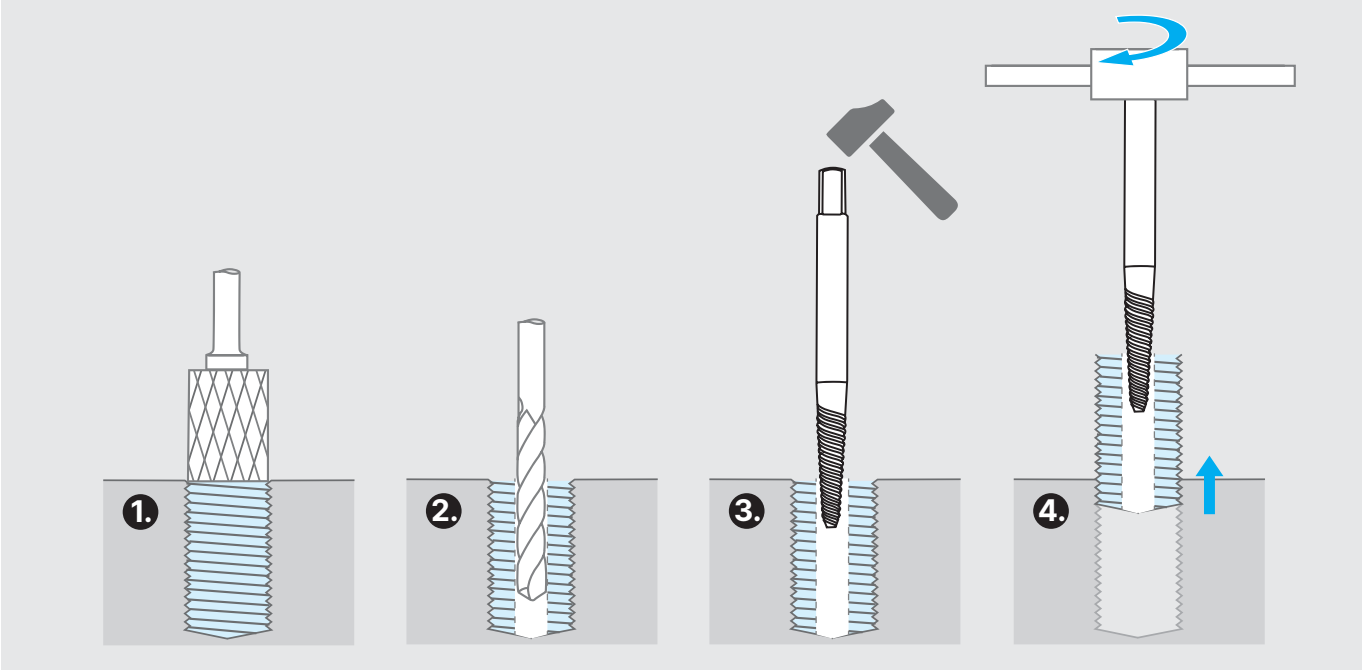
# Ref. 3409

## EXTRACTOR TORNILLOS
Screw Extractor
Extracteur vis

| Mod. | Para tornillos For Screws Pour vis | Para tornillos For Screws Pour vis | D mm | a mm | Nº Art. | € |
|---|---|---|---|---|---|---|
| 010 | **M3-M6** | 1/8-1/4 | 2,50 | 2,70 | 40639 | **3,08** |
| 020 | **M6-M8** | 1/4-5/16 | 3,00 | 3,80 | 40641 | **3,08** |
| 030 | **M8-M11** | 5/16-7/16 | 4,50 | 4,90 | 40642 | **3,21** |
| 040 | **M11-M14** | 7/16-9/16 | 6,00 | 7,00 | 40644 | **4,54** |
| 050 | **M15-M18** | 9/16-3/4 | 8,00 | 9,00 | 40645 | **7,12** |
| 060 | **M18-M24** | 3/4-1 | 11,00 | 12,00 | 40647 | **11,30** |

### Set 5 Pcs

| Juego para tornillos Set for Screws Jeu pour vis | Juego para tornillos Set for Screws Jeu pour vis | Nº Art. | € |
|---|---|---|---|
| **M3-M18** | **1/8-3/4** | 75905 | **21,03** |




**INSTRUCCIONES USO:**

1. **Alisar la superficie del tornillo con rotativa Ref. 9260.**
2. **Taladrar un agujero centrado con broca apropiada. Recomendamos Ref. 1016.**
3. **Introducir el extractor asegurándose de que quede fijo.**
4. **Girar el extractor hacia la izquierda hasta extraer el tornillo.**

**DIRECTIONS FOR USE:**

1. **Grind the Surface of the screw head with Rotary Burr Ref. 9260.**
2. **Drill a hole on the screw using a suitable drill bit. We recommend our Ref. 1016.**
3. **Introduce the extractor and make sure it gets fixed/locked.**
4. **Turn left the extractor until the screw gets out.**

INSTRUCTIONS D´EMPLOI:

1. Lissez la surface de la vis avec une fraise lime rotative Réf. 9260.
2. Percez un trou centré avec un foret approprié. Nous recommandons notre Réf. 1016.
3. Insérez l'extracteur et assurez-vous qu'il est fixé.
4. Tournez à gauche l'extracteur jusqu'à retirer la vis.

# REPARADORES ROSCAS
## Thread Repairs
## Filets rapportes

### Descripción

**Desgaste, corrosión, excesiva torsión al ajustar el tornillo... son algunas de las causas que llevan a dañar una rosca sin posibilidad de reparación.**

**La gama de reparadores de roscas IZARCOIL permite reparar dichas roscas dañadas de manera rápida y económica.**

**Unos reparadores de acero de gran calidad, para crear una rosca resistente a la temperatura y la corrosión.**

### Ventajas

- **Instalación rápida y sencilla**
- **Resistente al desgaste y a la tensión**
- **Resistente a la corrosión y termoestable**

### Ejemplos de aplicaciones

- **Refuerzo para roscar materiales con una reducida resistencia (p.e. aleaciones de aluminio y aleaciones de magnesio)**
- **Ingeniería mecánica**
- **Ingeniería de automoción y electricidad**

### Description

**Wear, corrosión or excessive screw tightening torque... are some of the reasons that lead to threads getting damaged beyond repair.**

**IZARCOIL threar repair range enables worn and damaged threads to be repaired quickly and at low cost.**

**In high-quality steel for a good thread, resistant to temperature and corrosion.**

### Advantages

- **Fast and easy to install**
- **Stress resistant and wear-free**
- **Corrosion resistant and thermostable**

### Examples of Applications

- **Thread reinforcement for materials with low shearing strength (e.g. aluminium or magnesium alloys)**
- **Mechanical engineering**
- **Automotive and electrical engineering**

### Description

Usure et trop de pression dans la fixation de la vis son des raisons pour endommager un filetage sans possibilité de réparation.

La gamme de filets rapportés IZARCOIL vous permet de réparer les filets endommagés rapidement et d´une façon économique.

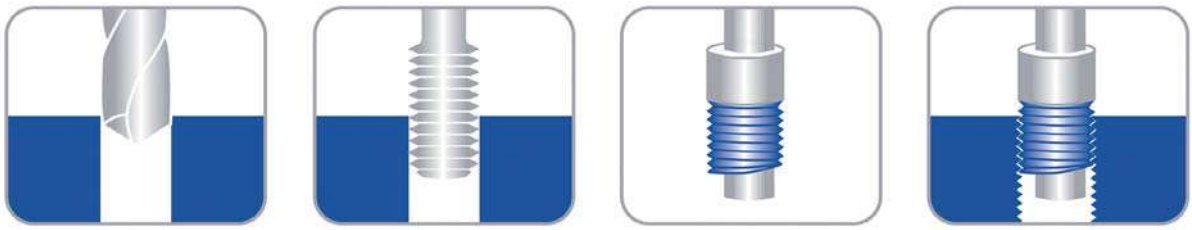
Filets rapportés en aciers haute qualité pour avoir un filetage résistant à la temperature et à l´usure.

### Avantages

- Installation rapide et simple
- Résistant á l´usure et a la tensión
- Résistant aux variations de température

### Exemples d´applications

- Soutien pour fileter aciers avec faible resistances (alliage aluminium et magnesium).
- Ingénierie mécanique
- Ingénierie auto et éléctricité



### Uso

1- **Taladrar la rosca dañada con una broca**
2- **Roscar con un macho IZARCOIL**
3- **Biselar el diámetro exterior a 90º y retirar la rebaba**
4- **Insertar el reparador de roscas con la ayuda del vástago**
5- **En caso de agujeros pasantes, usar un rompedor para la muesca**

### Use

1- **Drill the thread with a Drill Bit**
2- **Thread with an IZARCOIL tap**
3- **Bevel the external diameter at 90º and remove the burr**
4- **Insert the thread repair using the fitting tool**
5- **In case of through holes, use a pin-breaker for the notch**

### Emploi

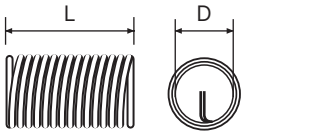
1- Percer le filet endommagé avec un foret
2- Tarauder avec un taraud IZARCOIL
3- Chanfreiner le diamètre exterieur à 90º et rétirer les copeaux
4- Inserer le reparateur de filets avec l´aide du guide
5- Pour trous débouchants, employer un brise-copeaux

# Ref. 3300

## INSERTO REPARACIÓN ROSCAS
Thread Repair Insert
Filet rapportés

INOX 304

M/MF




D = M (aprox.)

**P** **Aceros Steels** Aciers

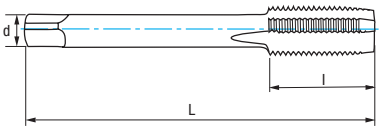
**N** **Aleaciones Alum. Alloys** / Alliages **Aleaciones Mg Alloys** / Alliages

| | M | P | L = 1xD | | | L = 1,5xD | | | L = 2xD | | | L = 2,5xD | | | L = 3xD | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Nº Art. | € 1 ud. | | Nº Art. | € 1 ud. | | Nº Art. | € 1 ud. | | Nº Art. | € 1 ud. | | Nº Art. | € 1 ud. |
| | **M3** | **0,50** | 25 | 56287 | **0,22** | 25 | 56288 | **0,22** | 25 | 56289 | **0,24** | 25 | 56291 | **0,28** | 25 | 56292 | **0,38** |
| | **M4** | **0,70** | 25 | 56293 | **0,22** | 25 | 56294 | **0,22** | 25 | 56297 | **0,24** | 25 | 56299 | **0,28** | 25 | 56300 | **0,35** |
| | **M5** | **0,80** | 25 | 56302 | **0,24** | 25 | 56303 | **0,22** | 25 | 56304 | **0,28** | 25 | 56306 | **0,34** | 25 | 56309 | **0,42** |
| | **M6+ *** | **1,00** | 25 | 56310 | **0,24** | 25 | 56311 | **0,22** | 25 | 56312 | **0,28** | 25 | 56313 | **0,34** | 25 | 56315 | **0,50** |
| New! | **M6– *** | **1,00** | 25 | 14857 | **0,24** | 25 | 14859 | **0,22** | 25 | 14863 | **0,28** | 25 | 14865 | **0,34** | 25 | 14866 | **0,50** |
| | **M7** | **1,00** | 25 | 56316 | **0,25** | 25 | 56318 | **0,31** | 25 | 56319 | **0,34** | 25 | 56320 | **0,39** | 25 | 56321 | **0,60** |
| | **M8** | **1,00** | 25 | 56322 | **0,28** | 25 | 56324 | **0,31** | 25 | 56325 | **0,38** | 25 | 56326 | **0,46** | 25 | 56327 | **0,63** |
| | **M8** | **1,25** | 25 | 56332 | **0,25** | 25 | 56333 | **0,28** | 25 | 56334 | **0,36** | 25 | 56336 | **0,44** | 25 | 56337 | **0,60** |
| | **M9** | **1,25** | 25 | 56339 | **0,38** | 25 | 56340 | **0,44** | 25 | 56341 | **0,53** | 25 | 56342 | **0,55** | 25 | 56343 | **0,72** |
| | MF10 | 1,00 | 25 | 56344 | **0,31** | 25 | 56345 | **0,36** | 25 | 56346 | **0,41** | 25 | 56347 | **0,53** | 25 | 56348 | **0,70** |
| | MF10 | 1,25 | 25 | 56349 | **0,31** | 25 | 56351 | **0,36** | 25 | 56352 | **0,41** | 25 | 56353 | **0,53** | 25 | 56354 | **0,70** |
| | **M10** | **1,50** | 25 | 56355 | **0,31** | 25 | 56357 | **0,36** | 25 | 56360 | **0,41** | 25 | 56361 | **0,53** | 10 | 56362 | **0,70** |
| | **M11** | **1,50** | 25 | 56363 | **0,46** | 25 | 56364 | **0,63** | 10 | 56365 | **0,67** | 10 | 56366 | **0,84** | 10 | 56367 | **1,03** |
| | MF12 | 1,00 | 25 | 56369 | **0,39** | 25 | 56371 | **0,58** | 10 | 56372 | **0,66** | 10 | 56373 | **0,77** | 10 | 56374 | **1,03** |
| | MF12 | 1,25 | 25 | 56375 | **0,39** | 25 | 56377 | **0,58** | 10 | 56378 | **0,66** | 10 | 56379 | **0,77** | 10 | 56381 | **1,03** |
| | MF12 | 1,50 | 25 | 56384 | **0,39** | 25 | 56385 | **0,58** | 10 | 56387 | **0,66** | 10 | 56388 | **0,77** | 10 | 56389 | **1,03** |
| | **M12** | **1,75** | 25 | 56390 | **0,39** | 25 | 56391 | **0,58** | 10 | 56392 | **0,66** | 10 | 56393 | **0,77** | 10 | 56394 | **1,03** |
| | MF14 | 1,00 | 10 | 56395 | **0,88** | 10 | 56396 | **0,90** | 10 | 56397 | **1,03** | 10 | 56399 | **1,25** | 10 | 56400 | **1,77** |
| | MF14 | 1,25 | 10 | 56401 | **0,73** | 10 | 56402 | **0,82** | 10 | 56403 | **0,88** | 10 | 56404 | **1,03** | 10 | 56405 | **1,37** |
| | MF14 | 1,50 | 10 | 56406 | **0,73** | 10 | 56407 | **0,82** | 10 | 56408 | **0,88** | 10 | 56409 | **1,03** | 10 | 56410 | **1,37** |
| | **M14** | **2,00** | 10 | 58844 | **0,73** | 10 | 58845 | **0,82** | 10 | 58846 | **0,88** | 10 | 58847 | **1,04** | 10 | 58848 | **1,37** |
| | MF16 | 1,50 | 10 | 56411 | **0,97** | 10 | 56412 | **1,02** | 10 | 56413 | **1,27** | 10 | 56414 | **1,38** | 10 | 56416 | **1,77** |
| | **M16** | **2,00** | 10 | 56417 | **0,97** | 10 | 56419 | **1,02** | 10 | 56420 | **1,27** | 10 | 56422 | **1,38** | 10 | 56423 | **1,77** |
| | MF18 | 2,00 | 10 | 56425 | **1,41** | 10 | 56427 | **1,65** | 10 | 56430 | **2,22** | 10 | 56431 | **2,53** | 10 | 56433 | **3,27** |
| | **M18** | **2,50** | 10 | 56434 | **1,41** | 10 | 56436 | **1,65** | 10 | 56439 | **2,22** | 10 | 56440 | **2,53** | 10 | 56442 | **3,27** |
| | **M20** | **2,50** | 10 | 67788 | **1,78** | 10 | 67790 | **2,22** | 10 | 67792 | **2,83** | 10 | 67794 | **3,22** | 10 | 70628 | **3,77** |
| | **M22** | **2,50** | 10 | 56445 | **1,79** | 10 | 56446 | **2,22** | 10 | 56448 | **2,84** | 10 | 56451 | **3,24** | 10 | 56452 | **4,28** |
| | MF24 | 2,00 | 10 | 56454 | **2,22** | 10 | 56457 | **2,36** | 10 | 56458 | **2,99** | 10 | 56460 | **3,90** | 10 | 56463 | **4,56** |
| | **M24** | **3,00** | 10 | 56464 | **2,22** | 10 | 56466 | **2,36** | 10 | 56467 | **2,99** | 10 | 56473 | **3,90** | 5 | 56476 | **4,56** |

*** M6+ → ø7,6 – ø7,7**
*** M6– → ø7,3 – ø7,4**

# Ref. 3305
IZARCOIL

## MACHO PARA INSERTO REPARACIÓN ROSCAS
Thread Repair Insert Tap
Taraud filet rapportés




HSS | M/MF | **P** Aceros **Steels** Aciers | **N** **Aleaciones Alum. Alloys** / Alliages **Aleaciones Mg Alloys** / Alliages

| M | P | D mm | d mm | L mm | l mm | a mm | z | Nº Art. | € |
|---|---|---|---|---|---|---|---|---|---|
| **M3** | **0,50** | 3,65 | 4,00 | 53 | 13 | 3,15 | 3 | 56615 | **8,54** |
| **M4** | **0,70** | 4,91 | 5,00 | 58 | 16 | 4,00 | 3 | 56617 | **9,24** |
| **M5** | **0,80** | 6,04 | 6,30 | 66 | 19 | 5,00 | 3 | 56620 | **9,38** |
| **M6** | **1,00** | 7,30 | 8,00 | 72 | 22 | 6,30 | 3 | 56622 | **9,38** |
| **M7** | **1,00** | 8,30 | 9,00 | 72 | 22 | 7,10 | 3 | 56623 | **13,10** |
| **M8** | **1,00** | 9,30 | 10,00 | 80 | 24 | 8,00 | 3 | 56628 | **13,10** |
| **M8** | **1,25** | 9,62 | 10,00 | 80 | 24 | 8,00 | 3 | 56626 | **12,23** |
| **M9** | **1,25** | 10,60 | 8,00 | 85 | 25 | 6,30 | 3 | 56629 | **16,04** |
| MF10 | 1,00 | 11,30 | 8,00 | 85 | 25 | 6,30 | 3 | 56638 | **16,04** |
| MF10 | 1,25 | 11,62 | 8,00 | 85 | 25 | 6,30 | 3 | 56634 | **16,04** |
| **M10** | **1,50** | 11,95 | 9,00 | 89 | 29 | 7,10 | 3 | 56632 | **16,04** |
| **M11** | **1,50** | 12,95 | 9,00 | 89 | 29 | 7,10 | 3 | 56640 | **18,15** |
| MF12 | 1,00 | 13,30 | 11,20 | 95 | 30 | 9,00 | 3 | 56646 | **22,17** |
| MF12 | 1,25 | 13,62 | 11,20 | 95 | 30 | 9,00 | 3 | 56648 | **22,17** |
| MF12 | 1,50 | 13,95 | 11,20 | 95 | 30 | 9,00 | 3 | 56647 | **22,17** |
| **M12** | **1,75** | 14,27 | 11,20 | 95 | 30 | 9,00 | 3 | 56644 | **17,21** |
| MF14 | 1,00 | 15,30 | 12,50 | 102 | 32 | 10,00 | 3 | 56650 | **25,24** |
| MF14 | 1,25 | 15,62 | 12,50 | 102 | 32 | 10,00 | 3 | 56652 | **25,24** |
| MF14 | 1,50 | 15,95 | 12,50 | 102 | 32 | 10,00 | 3 | 56651 | **25,24** |
| **M14** | **2,00** | 16,70 | 12,50 | 102 | 32 | 10,00 | 4 | 58849 | **25,24** |
| MF16 | 1,50 | 18,00 | 14,00 | 104 | 29 | 11,20 | 4 | 56654 | **30,20** |
| **M16** | **2,00** | 18,60 | 14,00 | 112 | 37 | 11,20 | 4 | 56653 | **30,20** |
| MF18 | 2,00 | 20,60 | 14,00 | 104 | 29 | 11,20 | 4 | 56657 | **38,23** |
| **M18** | **2,50** | 21,30 | 16,00 | 118 | 38 | 12,50 | 4 | 56656 | **38,23** |
| **M20** | **2,50** | 23,32 | 16,00 | 118 | 38 | 12,50 | 4 | 72852 | **43,29** |
| **M22** | **2,50** | 25,30 | 18,00 | 130 | 45 | 14,00 | 4 | 56658 | **48,36** |
| MF24 | 2,00 | 26,60 | 20,00 | 127 | 37 | 16,00 | 4 | 56660 | **61,13** |
| **M24** | **3,00** | 27,90 | 20,00 | 138 | 48 | 16,00 | 4 | 56659 | **61,13** |

| D Broca Drill Bit / Foret mm |
|---|
| 3,20 |
| 4,20 |
| 5,20 |
| 6,30 |
| 7,30 |
| 8,30 |
| 8,30 |
| 9,40 |
| 10,30 |
| 10,30 |
| 10,40 |
| 11,50 |
| 12,30 |
| 12,30 |
| 12,50 |
| 12,50 |
| 14,30 |
| 14,30 |
| 14,50 |
| 14,50 |
| 16,50 |
| 16,50 |
| 18,50 |
| 18,75 |
| 20,75 |
| 23,00 |
| 24,50 |
| 25,00 |

# Ref. 3303

**INSERTADOR**
Fitting Tool
Appareil de pose

| M | L mm | D mm | | N° Art. | € |
|---|---|---|---|---|---|
| **M3** | 132 | 2,20 | 1 | 70226 | **10,93** |
| **M4** | 132 | 3,00 | 1 | 66774 | **10,93** |
| **M5** | 132 | 4,00 | 1 | 66775 | **10,93** |
| **M6** | 132 | 4,90 | 1 | 66776 | **10,93** |
| **M8** | 132 | 6,50 | 1 | 66777 | **12,39** |
| **M10** | 132 | 7,00 | 1 | 66778 | **12,39** |
| **M12** | 132 | 9,50 | 1 | 66779 | **15,40** |
| **M14** | 132 | 11,00 | 1 | 66780 | **18,14** |
| **M16** | 132 | 12,75 | 1 | 79464 | **19,39** |
| **M18** | 132 | 14,90 | 1 | 79466 | **19,39** |
| **M20** | 132 | 15,95 | 1 | 79467 | **19,39** |
| **M22** | 132 | 17,95 | 1 | 83203 | **21,81** |
| **M24** | 132 | 20,00 | 1 | 79468 | **24,23** |

# Ref. 3307

**ROMPE ARRASTRES**
Pin-Breaker
Rupteur

| M | L mm | D mm | | N° Art. | € |
|---|---|---|---|---|---|
| **M3** | 100 | 2,20 | 1 | 70238 | **4,69** |
| **M4** | 100 | 3,00 | 1 | 66781 | **4,69** |
| **M5** | 100 | 4,00 | 1 | 66782 | **4,69** |
| **M6** | 100 | 4,90 | 1 | 66783 | **4,69** |
| **M8** | 100 | 6,50 | 1 | 66784 | **5,13** |
| **M10** | 100 | 7,00 | 1 | 66785 | **5,13** |
| **M12** | 100 | 9,50 | 1 | 66786 | **6,16** |
| **M14** | 100 | 11,00 | 1 | 66787 | **8,20** |
| **M16** | 100 | 12,75 | 1 | 79470 | **8,77** |
| **M18** | 100 | 14,90 | 1 | 79476 | **8,77** |
| **M20** | 100 | 15,95 | 1 | 79477 | **8,77** |
| **M22** | 100 | 17,95 | 1 | 83205 | **9,87** |
| **M24** | 100 | 20,00 | 1 | 79478 | **10,95** |

# Ref. 3310

## SET REPARACIÓN ROSCAS
Thread Repair Set
Set filet rapportés

M

P **Aceros** **Steels** Aciers

N **Aleaciones Alum. Alloys** / Alliages **Aleaciones Mg Alloys** / Alliages

### Set 95 Pcs

| Cont. M5-M12 | | | | Nº Art. | € |
|---|---|---|---|---|---|
| **Insertos** **Inserts** Rapportes | INOX 304 | **M5** **M6** **M8** **M10** **M12** | **0,80** **1,00** **1,25** **1,50** **1,75** | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5XD<br>5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5XD<br>5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5XD<br>5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5XD<br>5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5XD | 56481 | **275,21** |
| **Brocas** **Drill Bits** Forets **(D mm)** | | 5,20 - 6,30 - 8,30 - 10,40 - 12,50 | | | | |
| **Machos** **Taps** Tarauds **(D mm)** | HSS | 6,04 - 7,30 - 9,62 - 11,95 - 14,27 | | | | |
| **Insertadores** **Fitting Tools** Appareils de pose **(D mm)** | | 4,00 - 4,50 - 6,25 - 7,20 - 9,50 | | | | |
| **Rompe arrastres** **Pin-Breakers** Rupteurs **(D mm)** | | 4,00 - 4,50 - 6,25 - 7,20 - 9,50 | | | | |

# Ref. 3311

## SET REPARACIÓN ROSCAS BUJÍAS
Spark Plug Thread Repair Set
Set filet rapportés bougies

M/MF

P **Aceros** **Steels** Aciers

N **Aleaciones Alum. Alloys** / Alliages **Aleaciones Mg Alloys** / Alliages

### Set 94 Pcs

| Cont. M6-MF14 | | | | Nº Art. | € |
|---|---|---|---|---|---|
| **Insertos** **Inserts** Rapportes | INOX 304 | **M6** **M8** **M10** **M12** MF14 | **1,00** **1,25** **1,50** **1,75** 1,25 | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5XD<br>5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5XD<br>5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5XD<br>5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5XD<br>5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5XD | 56482 | **317,14** |
| **Brocas** **Drill Bits** Forets **(D mm)** | | 6,30 - 8,30 - 10,40 - 12,50 | | | | |
| **Machos** **Taps** Tarauds **(D mm)** | HSS | 7,30 - 9,62 - 11,95 - 14,27 - 15,60 | | | | |
| **Insertadores** **Fitting Tools** Appareils de pose **(D mm)** | | 4,50 - 6,25 - 7,20 - 9,50 - 11,00 | | | | |
| **Rompe arrastres** **Pin-Breakers** Rupteurs **(D mm)** | | 4,50 - 6,25 - 7,20 - 9,50 - 11,00 | | | | |

# Ref. 3312

## SET REPARACIÓN ROSCAS COMPLETO
Complete Thread Repair Set
Set filet rapportés complet

M/MF

| | |
|---|---|
| **P** | **Aceros** **Steels** Aciers |
| **N** | **Aleaciones Alum. Alloys** / Alliages **Aleaciones Mg Alloys** / Alliages |

### Set 19 Pcs

| M | P | INOX 304 **Insertos** **Inserts** Rapportés | HSS **Brocas** **Drill Bits** Forets **(D mm)** | HSS **Machos** **Taps** Tarauds **(D mm)** | **Insertadores** **Fitting Tools** Appareils de pose **(D mm)** | **Rompe arrastres** **Pin-Breakers** Rupteurs **(D mm)** | Nº **Art.** | € |
|---|---|---|---|---|---|---|---|---|
| **M3** | **0,50** | 5pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | 3,20 | 3,65 | 2,20 | 2,20 | 60330 | **39,06** |
| **M4** | **0,70** | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | 4,20 | 4,91 | 3,00 | 3,00 | 56484 | **39,06** |
| **M5** | **0,80** | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | 5,20 | 6,04 | 4,00 | 4,00 | 56487 | **38,86** |
| **M6** | **1,00** | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | 6,30 | 7,30 | 4,90 | 4,90 | 56488 | **41,84** |
| **M7** | **1,00** | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | 7,30 | 8,30 | 4,90 | 4,90 | 67804 | **50,92** |
| MF8 | 1,00 | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | 8,30 | 9,30 | 6,50 | 6,50 | 56497 | **50,92** |
| **M8** | **1,25** | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | 8,30 | 9,62 | 6,50 | 6,50 | 56490 | **50,92** |
| New! MF10 | 1,00 | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | 10,30 | 11,30 | 7,00 | 7,00 | 12675 | **56,97** |
| MF10 | 1,25 | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | 10,30 | 11,62 | 7,00 | 7,00 | 56500 | **56,97** |
| **M10** | **1,50** | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | 10,40 | 11,95 | 7,00 | 7,00 | 56493 | **56,97** |
| MF12 | 1,00 | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | 12,30 | 13,30 | 9,50 | 9,50 | 57967 | **65,34** |
| MF12 | 1,50 | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | 12,50 | 13,95 | 9,50 | 9,50 | 57964 | **65,34** |
| **M12** | **1,75** | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | 12,50 | 14,27 | 9,50 | 9,50 | 56496 | **65,34** |
| MF14 | 1,25 | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | * 14,30 | 15,62 | 11,00 | 11,00 | 57973 | **66,38** |
| **M14** | **2,00** | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | * 14,50 | 16,60 | 11,00 | 11,00 | 57970 | **75,11** |
| New! MF16 | 1,50 | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | * 16,50 | 18,00 | 12,75 | 12,75 | 23220 | **86,45** |
| New! **M16** | **2,00** | 5 pcs 1xD + 5 pcs 1,5xD + 5 pcs 2,5xD | * 16,50 | 18,60 | 12,75 | 12,75 | 23221 | **86,45** |

* **Diámetro de broca correspondiente. Broca no incluida**
**Corresponding drill bit diameter. Drill bit not included**
Diamètre de foret correspondant. Foret non inclus

# 05.

## FRESADO METAL DURO

Carbide Milling

Fraisage carbure

**FRESAS FRONTALES DESBASTE**
Roughing End Mills
Fraises Ébauche 324

**FRESAS FRONTALES ACABADO**
Finishing End Mills
Fraises finition 328

**FRESAS ACABADO TURBINAS**
Turbines Finishing End Mills
Fraises finition turbines 366

**FRESAS ACABADOS ESPECIALES**
Special Finishes End Mills
Fraises finitions spéciales 370

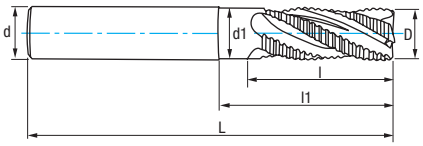
**FRESAS FIBRAS / COMPOSITES**
Fiber Composites End Mills
Fraises fibres / composites 375

**FRESAS DE ROSCAR**
Thread Mills
Fraises à fileter 380

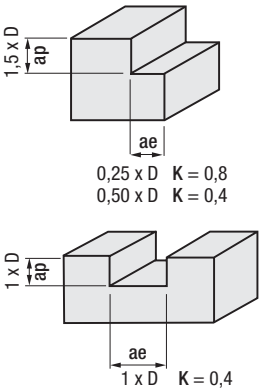
**JUEGOS FRESAS**
End Mill Sets
Jeux de fraises 384

# Ref. 9644

## FRESA METAL DURO DESBASTE USO GENERAL
General Purpose Roughing Carbide End Mill
Fraise carbure ébauche utilisation générale




| **MD**/HM Carbure Micrograno | CROMAX | IZAR Std. NR | | 4-5 Z | 45° | 30° | DIN 6535 HA | Tol. D (h10) d (h6) | |
|---|---|---|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | CROMAX | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.1 | 110-140 | 130-170 | 0,030 | 0,050 | 0,060 | 0,070 | 0,115 | 0,115 |
| | P.2 | 95-120 | 120-150 | 0,030 | 0,050 | 0,060 | 0,070 | 0,115 | 0,115 |
| | P.3 | 45-70 | 50-85 | 0,030 | 0,050 | 0,060 | 0,070 | 0,075 | 0,075 |
| K | K.1 | 50-75 | 60-85 | 0,030 | 0,050 | 0,060 | 0,070 | 0,075 | 0,075 |
| | K.2 | 50-75 | 60-90 | 0,030 | 0,050 | 0,060 | 0,070 | 0,127 | 0,150 |
| N | N.1 | 60-120 | 80-160 | 0,030 | 0,050 | 0,060 | 0,070 | 0,127 | 0,150 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

**New!**

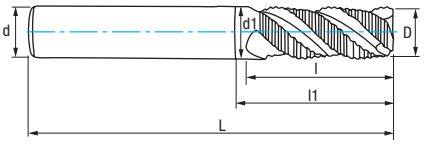
| D mm | d mm | L mm | l1 mm | l mm | d1 mm | Z | N° Art. MD/HM | € | N° Art. CROMAX | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **6,00** | 6,00 | 57 | 21 | 13 | 5,50 | 4 | 43531 | **37,44** | 43240 | **46,96** |
| **8,00** | 8,00 | 63 | 27 | 19 | 7,50 | 4 | 43532 | **42,26** | 43246 | **51,32** |
| **10,00** | 10,00 | 72 | 32 | 22 | 9,50 | 4 | 43533 | **50,72** | 43248 | **58,82** |
| **12,00** | 12,00 | 83 | 38 | 26 | 11,50 | 4 | 43534 | **73,40** | 43249 | **81,70** |
| **16,00** | 16,00 | 92 | 44 | 32 | 15,50 | 5 | 43536 | **113,56** | 43251 | **123,89** |
| **20,00** | 20,00 | 104 | 54 | 38 | 19,50 | 5 | 43537 | **189,21** | 43252 | **201,55** |

**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

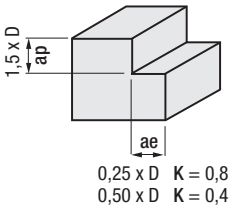
**Video**

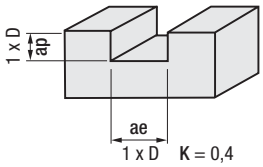
# Ref. 9647

## FRESA METAL DURO 3Z DESBASTE 45° INOX
Stainless 45° Roughing 3Z Carbide End Mill
Fraise carbure 3Z ébauche 45° Inox




| MD/HM Carbure Micrograno | CROMAX | IZAR Std. WR | | 3 Z | 45° | 45° | DIN 6535 HA | Tol. D (h10) d (h6) | |
|---|---|---|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | CROMAX | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.5 | 75-90 | 90-110 | 0,030 | 0,050 | 0,060 | 0,070 | 0,090 | 0,120 |
| M | | 40-60 | 50-80 | 0,030 | 0,050 | 0,060 | 0,070 | 0,090 | 0,120 |
| S | | 40-70 | 50-80 | 0,060 | 0,070 | 0,080 | 0,100 | 0,150 | 0,180 |
| N | N.5 | 90-200 | 100-230 | 0,040 | 0,060 | 0,070 | 0,100 | 0,150 | 0,180 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

New!

| D mm | d mm | L mm | l1 mm | l mm | d1 mm | Z | N° Art. MD/HM | € | N° Art. CROMAX | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **6,00** | 6,00 | 57 | 21 | 13 | 5,50 | 3 | 43538 | **41,46** | 43253 | **50,97** |
| **8,00** | 8,00 | 63 | 27 | 19 | 7,50 | 3 | 43539 | **47,48** | 43260 | **55,71** |
| **10,00** | 10,00 | 72 | 32 | 22 | 9,50 | 3 | 43540 | **52,16** | 43261 | **60,27** |
| **12,00** | 12,00 | 83 | 38 | 26 | 11,50 | 3 | 43542 | **74,70** | 43285 | **83,00** |
| **16,00** | 16,00 | 92 | 44 | 32 | 15,50 | 3 | 43543 | **120,67** | 43286 | **131,01** |
| **20,00** | 20,00 | 104 | 54 | 38 | 19,50 | 3 | 43544 | **201,27** | 43288 | **213,61** |

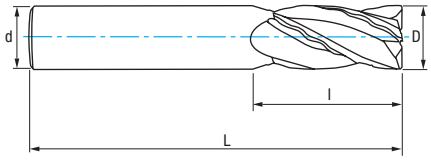
**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

# Ref. 9444

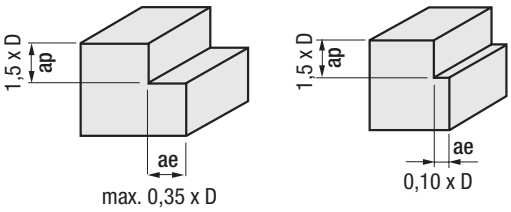
IZARCUT

## FRESA FRONTAL METAL DURO 4Z CREST CUT ALTO RENDIMIENTO
High Performance Crest Cut 4Z Carbide End Mill
Fraise Carbure 4Z Crest Cut haute performance

New!




| MD/HM Carbure Grano MG | CROMAX | DIN 6528 N | | 4 Z | 30° | DIN 6535 HA | Tol. D (e8) d (h6) | | 45° |
|---|---|---|---|---|---|---|---|---|---|

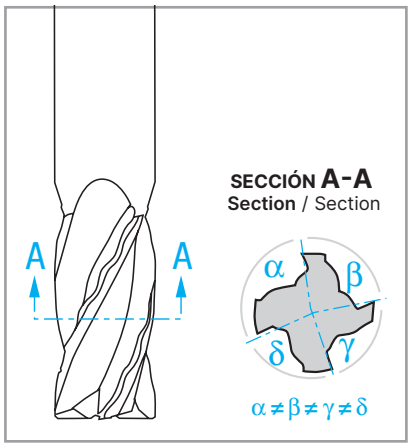



| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | CROMAX | Ø8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.2 | 112-150 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | P.3 | 60-130 | 0,035 | 0,040 | 0,050 | 0,060 | 0,075 |
| | P.5 | 50-80 | 0,035 | 0,035 | 0,050 | 0,120 | 0,150 |
| M | | 100-130 | 0,025 | 0,025 | 0,040 | 0,100 | 0,120 |
| K | K.1 | 60-80 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | K.2 | 40-60 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 |
| S | | 90-130 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| N | N.1 | 140-350 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.2 | 140-350 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** Coeficiente corrección
Correction coefficient
Coéficient correction



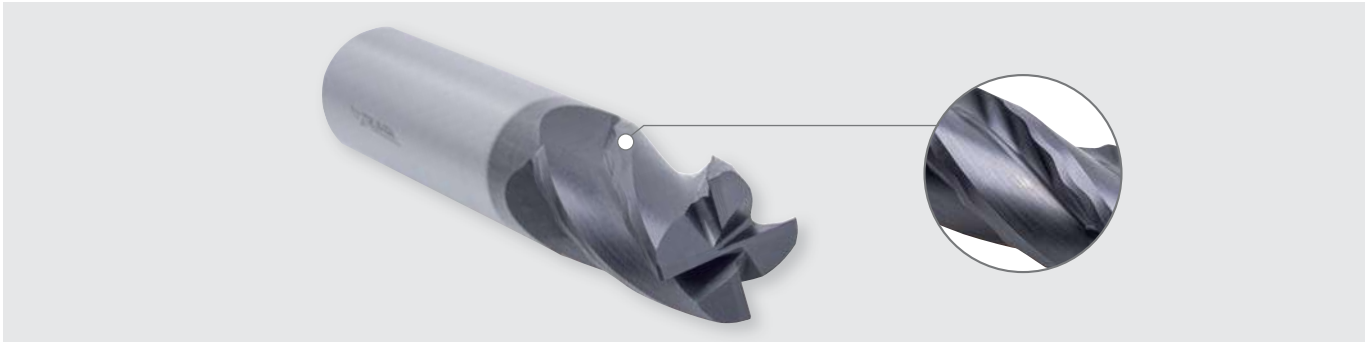

| D mm | d mm | L mm | l mm | Z | N° Art. CROMAX | € |
|---|---|---|---|---|---|---|
| **10,00** | 10,00 | 72 | 22 | 4 | 28759 | **49,26** |
| **12,00** | 12,00 | 83 | 26 | 4 | 28760 | **67,29** |
| **16,00** | 16,00 | 92 | 32 | 4 | 28761 | **104,99** |

**DIN 6535 HB**
**Bajo demanda / upon request** / sur demande

1. **Desbaste y Acabado con la misma herramienta**
2. **Mayor profundidad de corte (hasta un 40%)**
3. **Excelente control de viruta, especialmente sobre Titanio**
4. **Excelente calidad superficial**

1. **Roughing & Finishing with the same tool**
2. **Higher cutting depth (up to 40%)**
3. **Excellent chipping control, especially for titanium**
4. **Excellent surface quality**

1. Ebauche et finition avec le même outil
2. Meilleure proffondeur de coupe (jusqu´au 40%)
3. Excellent contrôle des copeaux, surtout pour le titane
4. Excellente qualité de surface



# IKRA, UN RECUBRIMIENTO SUPERIOR

**NUEVO RECUBRIMIENTO PARA TRABAJOS EXIGENTES EN MATERIALES ENDURECIDOS 55-70 HRC**

IKRA

## IKRA, the supreme coating

New coating for demanding works in hardened materials 55-70 HRC

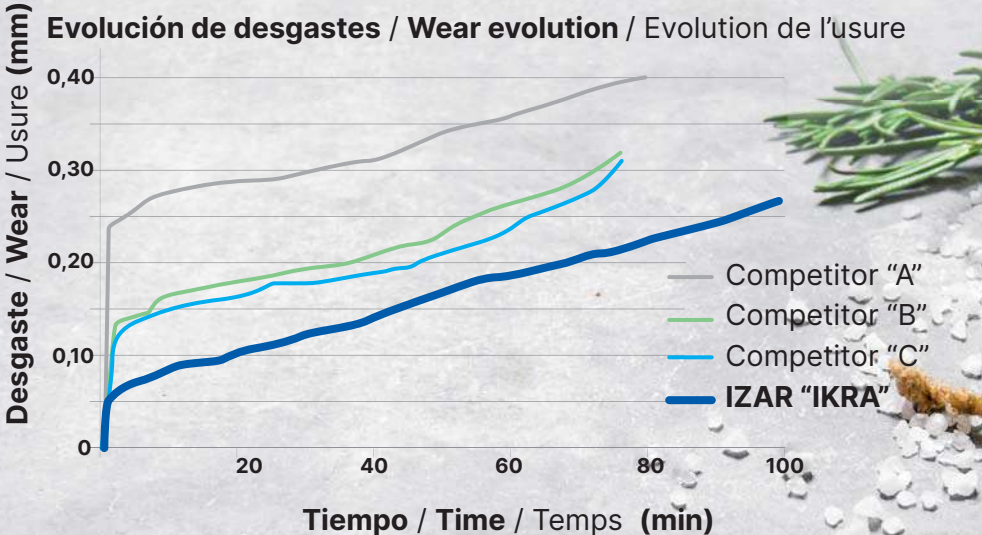
## IKRA, un revêtement supérieur

Nouveau revêtement pour les travaux exigeants dans les matériaux durcis 55-70 HRC

| Base AlTiN<br>AlTiN Base<br>Base AlTiN | |
|---|---|
| **Dureza /** Hardness / Dureté **HV(0,05)** | **3500+-300** |
| **Oxidación** / Oxidation / Oxidation | **1000°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient/Coéficient Friction | **0,35** |
| **Color /** Colour / Couleur:<br>**Gris /** Grey / Gris | |

**Mat. 90MnCrV8 (63-65 HRC)**

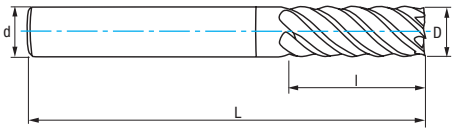
**Evolución de desgastes** / **Wear evolution** / Evolution de l'usure



*** Testado contra las marcas más conocidas del mercado**
* Comparative test against well-known brands in the market
* Testé contre les marques les plus connues du marché

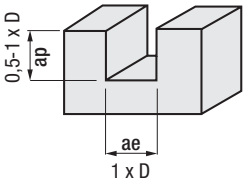
# Ref. 9405

## FRESA METAL DURO SUPER-ACABADO 48-70 HRC
48-70 HRC Super-Finishing Carbide End Mill
Fraise carbure super-finition 48-70 HRC

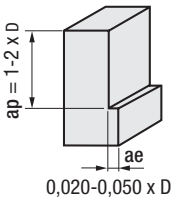



| **MD**/HM Carbure Grano UF | IKRA | DIN 6528 N | | 6-8 Z | 45° | DIN 6535 HA | Tol. D (e8) d (h6) | 0,20×45° |
|---|---|---|---|---|---|---|---|---|

**Ranurado**
**Slotting**
Rainurage




**Acabado Precisión**
**Finishing**
Finition précision




**Mecanizado Alta Velocidad**
**High Speed Machining** / Usinage haute vitesse

**Recomendado trabajo en seco**
**Dry-working recommended** - Recommandé travail en sec

| Material Grupo | Material Sub. | Vc (m/min) IKRA | Avances fz/rev. (mm/z) - Feed - Pas Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
|---|---|---|---|---|---|---|---|---|
| P | P.2 | 250-300 | 0,060 | 0,060 | 0,060 | 0,050 | 0,040 | 0,040 |
| | P.3 | 120-180 | 0,050 | 0,050 | 0,050 | 0,040 | 0,030 | 0,030 |
| H | | 75-130 | 0,045 | 0,045 | 0,040 | 0,030 | 0,025 | 0,025 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

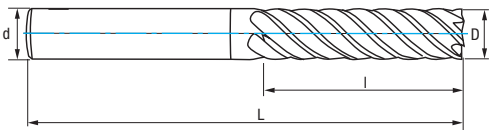
**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. IKRA | € |
|---|---|---|---|---|---|---|
| **6,00** | 6,00 | 57 | 13 | 6 | 28751 | **47,71** |
| **8,00** | 8,00 | 63 | 19 | 6 | 28752 | **60,48** |
| **10,00** | 10,00 | 72 | 22 | 6 | 28753 | **90,55** |
| **12,00** | 12,00 | 83 | 26 | 6 | 28754 | **123,04** |
| **16,00** | 16,00 | 92 | 32 | 8 | 28755 | **206,91** |
| **20,00** | 20,00 | 104 | 38 | 8 | 28756 | **304,00** |

**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

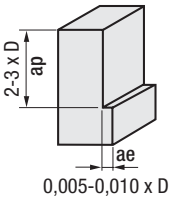
# Ref. 9415

## FRESA METAL DURO SERIE LARGA SUPER-ACABADO 48-70 HRC
48-70 HRC Super-Finishing Long Series Carbide End Mill
Fraise carbure série longue super-finition 48-70 HRC




| **MD**/HM Carbure Grano UF | IKRA | DIN 6528 N | | 6-8 Z | 45° | DIN 6535 HA | Tol. D (e8) d (h6) | 0,20×45° |
|---|---|---|---|---|---|---|---|---|

**Acabado Precisión**
**Finishing**
Finition précision




**Mecanizado Alta Velocidad**
**High Speed Machining** / Usinage haute vitesse

**Recomendado trabajo en seco**
**Dry-working recommended** - Recommandé travail en sec

| Material Grupo | Material Sub. | Vc (m/min) IKRA | Avances fz/rev. (mm/z) - Feed - Pas Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
|---|---|---|---|---|---|---|---|---|
| P | P.2 | 250-300 | 0,060 | 0,060 | 0,060 | 0,050 | 0,040 | 0,040 |
| | P.3 | 120-180 | 0,050 | 0,050 | 0,050 | 0,040 | 0,030 | 0,030 |
| H | | 75-130 | 0,045 | 0,045 | 0,040 | 0,030 | 0,025 | 0,025 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

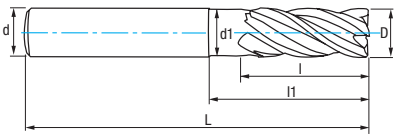
**Serie Larga**
Long Series
Série Longue

| D mm | d mm | L mm | l mm | Z | N° Art. IKRA | € |
|---|---|---|---|---|---|---|
| **6,00** | 6,00 | 75 | 20 | 6 | 10661 | **64,96** |
| **8,00** | 8,00 | 75 | 25 | 6 | 10691 | **85,40** |
| **10,00** | 10,00 | 100 | 30 | 6 | 10694 | **132,86** |
| **12,00** | 12,00 | 100 | 45 | 6 | 10697 | **186,75** |
| **16,00** | 16,00 | 100 | 50 | 8 | 10700 | **324,83** |

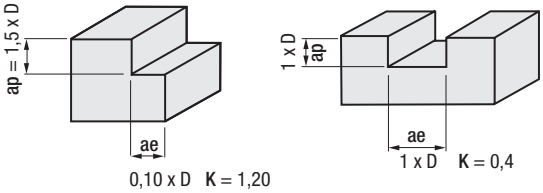
**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

# Ref. 9406

## FRESA METAL DURO HÉLICE ALTERNA ALTO RENDIMIENTO 48-70 HRC
48-70 HRC High Performance Unequal Helix Carbide End Mill
Fraise carbure hélice alternée haut rendement 48-70 HRC




| MD/HM Carbure Grano UF | IKRA | DIN 6528 N | | 4-5 Z | DIN 6535 HA | | 38° 0,20×45° 35° |
|---|---|---|---|---|---|---|---|




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| Material Grupo | Sub. | Vc (m/min) IKRA |
|---|---|---|
| P | P.2 | 112-150 |
| | P.3 | 60-130 |
| | P.5 | 100-130 |
| M | | 50-80 |
| K | K.1 | 80-120 |
| | K.2 | 80-100 |
| S | Ti6Al44V | 70-90 |
| | Inconel 718 | 100-130 |
| N | N.1 | 140-350 |
| | N.2 | 140-350 |

| Avances fz/rev. (mm/z) - Feed - Pas | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
|---|---|---|---|---|---|---|---|---|
| | 0,018 | 0,030 | 0,040 | 0,056 | 0,070 | 0,090 | 0,112 | 0,140 |
| | 0,015 | 0,027 | 0,036 | 0,050 | 0,056 | 0,070 | 0,084 | 0,105 |
| | 0,011 | 0,019 | 0,025 | 0,035 | 0,035 | 0,056 | 0,080 | 0,100 |
| | 0,015 | 0,027 | 0,036 | 0,049 | 0,049 | 0,070 | 0,070 | 0,080 |
| | 0,018 | 0,030 | 0,040 | 0,056 | 0,077 | 0,091 | 0,112 | 0,140 |
| | 0,018 | 0,030 | 0,040 | 0,056 | 0,077 | 0,091 | 0,112 | 0,140 |
| | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 |
| | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 |
| | 0,020 | 0,039 | 0,051 | 0,070 | 0,084 | 0,105 | 0,112 | 0,175 |
| | 0,020 | 0,039 | 0,051 | 0,070 | 0,084 | 0,105 | 0,112 | 0,175 |

| | D mm | d mm | L mm | l1 mm | l mm | d1 mm | Z | N° Art. IKRA | € |
|---|---|---|---|---|---|---|---|---|---|
| | 2,00 | 3,00 | 38 | 6 | 3 | 1,95 | 4 | 67260 | 31,25 |
| New! | 2,50 | 2,50 | 38 | 12 | 8 | 2,40 | 4 | 78707 | 31,25 |
| | 3,00 | 3,00 | 38 | 12 | 8 | 2,85 | 4 | 36210 | 31,25 |
| New! | 3,50 | 3,50 | 50 | 15 | 10 | 3,35 | 4 | 78708 | 31,25 |
| | 4,00 | 4,00 | 50 | 16 | 11 | 3,50 | 4 | 35245 | 31,25 |
| New! | 4,50 | 4,50 | 50 | 16 | 11 | 4,00 | 4 | 78711 | 31,25 |
| | 5,00 | 5,00 | 50 | 19 | 13 | 4,50 | 4 | 36211 | 31,25 |
| New! | 5,50 | 5,50 | 57 | 21 | 13 | 5,00 | 4 | 84133 | 33,55 |
| | 6,00 | 6,00 | 57 | 21 | 13 | 5,50 | 4 | 28762 | 33,55 |
| New! | 6,50 | 6,50 | 60 | 24 | 16 | 6,00 | 4 | 84134 | 46,21 |
| New! | 7,00 | 7,00 | 60 | 24 | 16 | 6,50 | 4 | 84135 | 46,21 |
| New! | 7,50 | 7,50 | 63 | 27 | 19 | 7,00 | 4 | 84136 | 46,21 |
| | 8,00 | 8,00 | 63 | 27 | 19 | 7,50 | 4 | 28763 | 46,21 |
| New! | 8,50 | 8,50 | 67 | 29 | 19 | 8,00 | 4 | 84324 | 58,61 |
| New! | 9,00 | 9,00 | 67 | 29 | 19 | 8,50 | 4 | 84326 | 58,61 |
| New! | 9,50 | 9,50 | 72 | 32 | 22 | 9,00 | 4 | 84327 | 58,61 |
| | 10,00 | 10,00 | 72 | 32 | 22 | 9,50 | 4 | 28764 | 58,61 |
| | 12,00 | 12,00 | 83 | 38 | 26 | 11,50 | 4 | 28765 | 81,59 |
| | 14,00 | 14,00 | 83 | 38 | 26 | 13,50 | 4 | 67250 | 110,41 |
| | 16,00 | 16,00 | 92 | 44 | 32 | 15,50 | 5 | 28766 | 123,89 |
| | 18,00 | 18,00 | 92 | 44 | 32 | 17,50 | 5 | 69716 | 146,86 |
| | 20,00 | 20,00 | 104 | 54 | 38 | 19,50 | 5 | 39057 | 190,77 |

6 Pcs

| Cont. Ø | N° Art. IKRA | € |
|---|---|---|
| 4-5-6-8-10-12 mm | 67688 | Set Price! 268,34 |

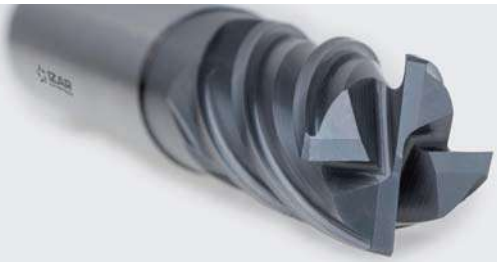
DIN 6535 HB
**Bajo demanda** / upon request / sur demande

**1. Eliminación de vibraciones.**
**2. Gran calidad superficial.**
**3. Mayores avances (hasta 40-50%).**
**4. Mayor vida de la herramienta**
➜ **Mayor productividad**
**5. Mejor evacuación de viruta.**

**1. No vibrations.**
**2. Good surface quality.**
**3. Higher feed (up to 40-50%).**
**4. Longer tool life**
➜ **Higher Productivity**
**5. Better chipping.**

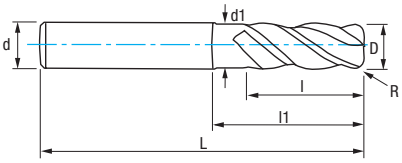
1. Sans vibrations.
2. Haute qualité de surface.
3. Meilleurs avances (jusqu´au 40-50%).
4. Vie utile de l´outil plus longue
➜ Haute Productivité
5. Meilleure évacuation copeaux.

Video

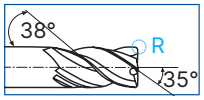


# Ref. 9446

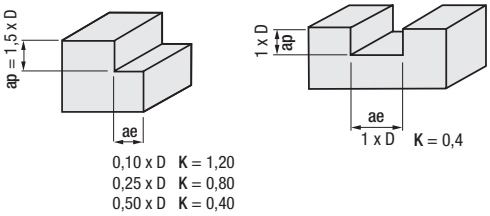
## FRESA TÓRICA METAL DURO HÉLICE ALTERNA 48-70 HRC
Unequal Helix Radius 48-70 HRC Carbide End Mill
Fraise torique carbure hélice alternée 48-70 HRC




**MD**/HM Carbure Grano UF | IKRA | DIN 6528 N | 4-5 Z




3D




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | IKRA | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.2 | 112-150 | 0,040 | 0,056 | 0,070 | 0,090 | 0,112 | 0,140 |
| | P.3 | 60-130 | 0,036 | 0,050 | 0,056 | 0,070 | 0,084 | 0,105 |
| | P.5 | 100-130 | 0,025 | 0,035 | 0,035 | 0,056 | 0,080 | 0,100 |
| M | | 50-80 | 0,036 | 0,049 | 0,049 | 0,070 | 0,070 | 0,080 |
| S | Ti6Al44V | 70-90 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 |
| | Inconel 718 | 100-130 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 |
| N | N.1 | 140-350 | 0,051 | 0,070 | 0,084 | 0,105 | 0,112 | 0,175 |
| | N.2 | 140-350 | 0,051 | 0,070 | 0,084 | 0,105 | 0,112 | 0,175 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

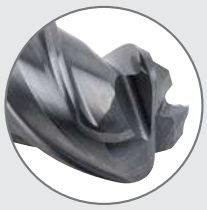
**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l1 mm | l mm | d1 mm | Z | R mm | N° Art. IKRA | € |
|---|---|---|---|---|---|---|---|---|---|
| **6,00** | 6,00 | 57 | 21 | 13 | 5,50 | 4 | 1,00 | 80809 | **36,92** |
| **6,00** | 6,00 | 57 | 21 | 13 | 5,50 | 4 | 2,00 | 80810 | **36,92** |
| **8,00** | 8,00 | 63 | 27 | 19 | 7,50 | 4 | 1,00 | 80811 | **50,82** |
| **8,00** | 8,00 | 63 | 27 | 19 | 7,50 | 4 | 2,00 | 80812 | **50,82** |
| **10,00** | 10,00 | 72 | 32 | 22 | 9,50 | 4 | 1,00 | 80813 | **64,48** |
| **10,00** | 10,00 | 72 | 32 | 22 | 9,50 | 4 | 2,00 | 80814 | **64,48** |
| **10,00** | 10,00 | 72 | 32 | 22 | 9,50 | 4 | 3,00 | 80815 | **64,48** |
| **12,00** | 12,00 | 83 | 38 | 26 | 11,50 | 4 | 1,00 | 80816 | **89,74** |
| **12,00** | 12,00 | 83 | 38 | 26 | 11,50 | 4 | 2,00 | 80817 | **89,74** |
| **12,00** | 12,00 | 83 | 38 | 26 | 11,50 | 4 | 3,00 | 80796 | **89,74** |
| **14,00** | 14,00 | 83 | 38 | 26 | 13,50 | 4 | 1,00 | 80818 | **121,45** |
| **14,00** | 14,00 | 83 | 38 | 26 | 13,50 | 4 | 2,00 | 80819 | **121,45** |
| **14,00** | 14,00 | 83 | 38 | 26 | 13,50 | 4 | 3,00 | 80820 | **121,45** |
| **16,00** | 16,00 | 92 | 44 | 32 | 15,50 | 5 | 2,00 | 80824 | **136,28** |
| **16,00** | 16,00 | 92 | 44 | 32 | 15,50 | 5 | 3,00 | 80825 | **136,28** |
| **20,00** | 20,00 | 104 | 54 | 38 | 19,50 | 5 | 2,00 | 80826 | **209,84** |
| **20,00** | 20,00 | 104 | 54 | 38 | 19,50 | 5 | 3,00 | 80827 | **209,84** |

1. **Eliminación de vibraciones**
2. **Mayores avances (hasta 40-50%)**
3. **Mayor vida de la herramienta ⇒ Mayor productividad**
4. **Óptimo para la fabricación aditiva 3D**

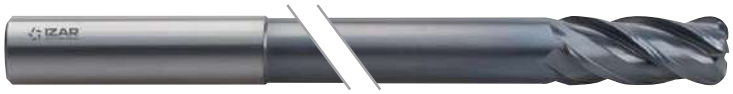
1. No vibrations
2. Higher feed (up to 40-50%)
3. Longer tool life ⇒ Higher Productivity
4. Suitable for 3D metal additive manufacturing

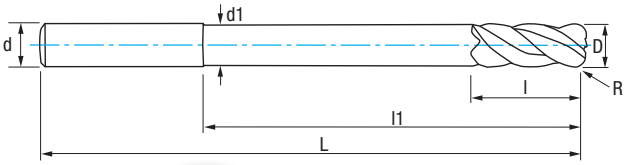
1. Sans vibrations
2. Meilleurs avances (jusqu´au 40-50%)
3. Vie utile de l´outil plus longue ⇒ Haute productivité
4. Optimal pour la fabrication additive de métaux 3D



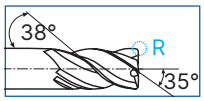
# Ref. 9447

## FRESA TÓRICA METAL DURO HÉLICE ALTERNA 48-70 HRC. SERIE LARGA
Unequal Helix Radius 48-70 HRC Carbide End Mill. Long Series
Fraise torique carbure hélice alternée 48-70 HRC. Série longue

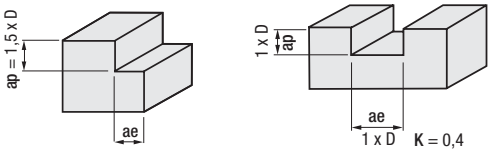





**MD**/HM Carbure Grano UF | IKRA | DIN 6528 N | 4-5 Z




3D




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | IKRA | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.2 | 112-150 | 0,040 | 0,056 | 0,070 | 0,090 | 0,112 | 0,140 |
| | P.3 | 60-130 | 0,036 | 0,050 | 0,056 | 0,070 | 0,084 | 0,105 |
| | P.5 | 100-130 | 0,025 | 0,035 | 0,035 | 0,056 | 0,080 | 0,100 |
| M | | 50-80 | 0,036 | 0,049 | 0,049 | 0,070 | 0,070 | 0,080 |
| S | Ti6Al44V | 70-90 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 |
| | Inconel 718 | 100-130 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 |
| N | N.1 | 140-350 | 0,051 | 0,070 | 0,084 | 0,105 | 0,112 | 0,175 |
| | N.2 | 140-350 | 0,051 | 0,070 | 0,084 | 0,105 | 0,112 | 0,175 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

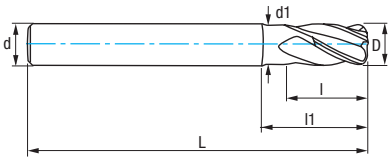
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

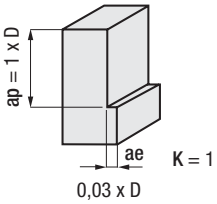
| D mm | d mm | L mm | l1 mm | l mm | d1 mm | Z | R mm | N° Art. IKRA | € |
|---|---|---|---|---|---|---|---|---|---|
| **6,00** | 6,00 | 100 | 64 | 13 | 5,50 | 4 | 1,00 | 80821 | **59,06** |
| **6,00** | 6,00 | 100 | 64 | 13 | 5,50 | 4 | 2,00 | 80822 | **59,06** |
| **8,00** | 8,00 | 100 | 64 | 19 | 7,50 | 4 | 1,00 | 80935 | **76,24** |
| **8,00** | 8,00 | 100 | 64 | 19 | 7,50 | 4 | 2,00 | 80936 | **76,24** |
| **10,00** | 10,00 | 100 | 60 | 22 | 9,50 | 4 | 1,00 | 80937 | **96,73** |
| **10,00** | 10,00 | 100 | 60 | 22 | 9,50 | 4 | 2,00 | 80942 | **96,73** |
| **10,00** | 10,00 | 100 | 60 | 22 | 9,50 | 4 | 3,00 | 80943 | **96,73** |
| **12,00** | 12,00 | 150 | 105 | 26 | 11,50 | 4 | 1,00 | 80944 | **134,62** |
| **12,00** | 12,00 | 150 | 105 | 26 | 11,50 | 4 | 2,00 | 80945 | **134,62** |
| **12,00** | 12,00 | 150 | 105 | 26 | 11,50 | 4 | 3,00 | 80797 | **134,62** |
| **14,00** | 14,00 | 150 | 105 | 26 | 13,50 | 4 | 1,00 | 80946 | **182,18** |
| **14,00** | 14,00 | 150 | 105 | 26 | 13,50 | 4 | 2,00 | 80947 | **182,18** |
| **14,00** | 14,00 | 150 | 105 | 26 | 13,50 | 4 | 3,00 | 80949 | **182,18** |
| **16,00** | 16,00 | 150 | 102 | 32 | 15,50 | 5 | 2,00 | 80950 | **204,40** |
| **16,00** | 16,00 | 150 | 102 | 32 | 15,50 | 5 | 3,00 | 80951 | **204,40** |
| **20,00** | 20,00 | 150 | 100 | 38 | 19,50 | 5 | 2,00 | 80952 | **272,81** |
| **20,00** | 20,00 | 150 | 100 | 38 | 19,50 | 5 | 3,00 | 80954 | **272,81** |

# Ref. 9461

## FRESA TÓRICA METAL DURO 4Z 48-70 HRC
48-70 HRC 4Z Radius Carbide End Mill
Fraise torique carbure 4Z 48-70 HRC




| **MD**/HM Carbure Grano UF | IKRA | DIN 6528 N | | 4 Z | R | DIN 6535 HA |
|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | IKRA | Ø 1 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.2 | 130-160 | 0,008 | 0,025 | 0,037 | 0,047 | 0,057 | 0,065 | 0,075 | 0,085 |
| | P.3 | 100-130 | 0,007 | 0,024 | 0,033 | 0,043 | 0,051 | 0,060 | 0,070 | 0,078 |
| | P.4 | 60-90 | 0,006 | 0,024 | 0,033 | 0,043 | 0,051 | 0,060 | 0,070 | 0,078 |
| H | | 40-70 | 0,003 | 0,012 | 0,017 | 0,020 | 0,025 | 0,030 | 0,035 | 0,040 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

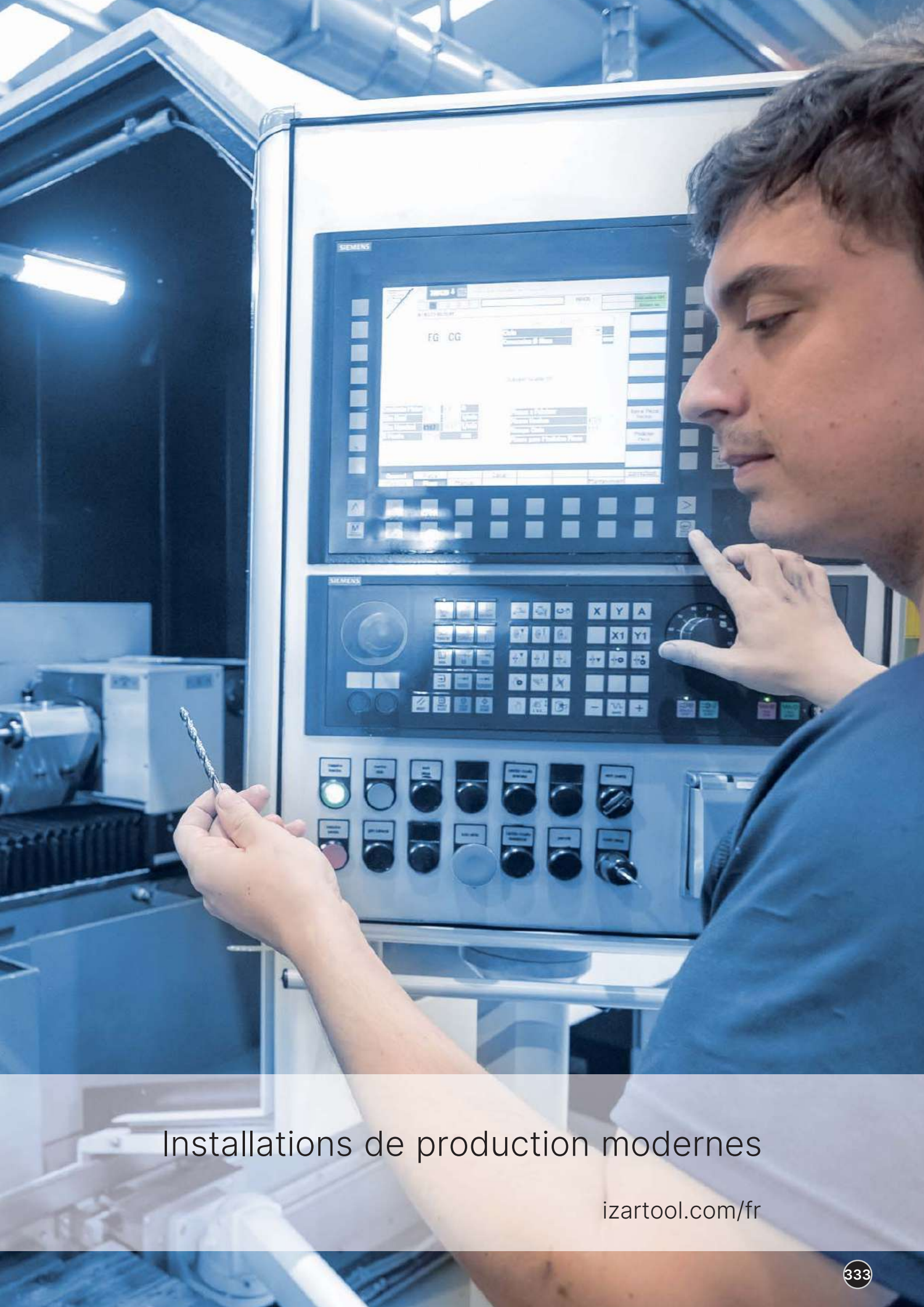
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l1 mm | l mm | d1 mm | R mm | Z | N° Art. IKRA | € |
|---|---|---|---|---|---|---|---|---|---|
| **1,00** | 3,00 | 38 | 3 | 1,50 | | 0,10 | 4 | 22694 | **32,19** |
| **1,50** | 3,00 | 38 | 4 | 2,20 | | 0,10 | 4 | 22695 | **32,19** |
| **2,00** | 3,00 | 38 | 6 | 3,00 | 1,95 | 0,10 | 4 | 22802 | **32,19** |
| **2,00** | 3,00 | 38 | 6 | 3,00 | 1,95 | 0,50 | 4 | 80567 | **32,19** |
| **2,50** | 3,00 | 38 | 8 | 4,00 | 2,40 | 0,10 | 4 | 22865 | **32,19** |
| **3,00** | 3,00 | 38 | 8 | 4,00 | 2,85 | 0,10 | 4 | 22868 | **32,19** |
| **3,00** | 3,00 | 38 | 8 | 4,00 | 2,85 | 0,20 | 4 | 80568 | **32,19** |
| **3,00** | 3,00 | 38 | 8 | 4,00 | 2,85 | 0,50 | 4 | 80569 | **32,19** |
| **3,00** | 3,00 | 38 | 8 | 4,00 | 2,85 | 1,00 | 4 | 80570 | **32,19** |
| **4,00** | 4,00 | 50 | 11 | 5,00 | 3,85 | 0,10 | 4 | 22871 | **32,19** |
| **4,00** | 4,00 | 50 | 11 | 5,00 | 3,85 | 0,30 | 4 | 80574 | **32,19** |
| **4,00** | 4,00 | 50 | 11 | 5,00 | 3,85 | 0,50 | 4 | 80575 | **32,19** |
| **4,00** | 4,00 | 50 | 11 | 5,00 | 3,85 | 1,00 | 4 | 80576 | **32,19** |
| **5,00** | 5,00 | 50 | 13 | 6,00 | 4,85 | 0,20 | 4 | 22880 | **32,19** |
| **5,00** | 5,00 | 50 | 13 | 6,00 | 4,85 | 0,50 | 4 | 80577 | **32,19** |
| **5,00** | 5,00 | 50 | 13 | 6,00 | 4,85 | 1,00 | 4 | 80578 | **32,19** |
| **6,00** | 6,00 | 57 | 13 | 7,00 | 5,85 | 0,20 | 4 | 22889 | **34,56** |
| **6,00** | 6,00 | 57 | 13 | 7,00 | 5,85 | 0,50 | 4 | 22895 | **34,56** |
| **6,00** | 6,00 | 57 | 13 | 7,00 | 5,85 | 1,00 | 4 | 80579 | **34,56** |
| **6,00** | 6,00 | 57 | 13 | 7,00 | 5,85 | 1,50 | 4 | 80581 | **34,56** |
| **6,00** | 6,00 | 57 | 13 | 7,00 | 5,85 | 2,00 | 4 | 80582 | **34,56** |
| **8,00** | 8,00 | 63 | 19 | 9,00 | 7,70 | 0,20 | 4 | 22898 | **47,60** |
| **8,00** | 8,00 | 63 | 19 | 9,00 | 7,70 | 0,50 | 4 | 22904 | **47,60** |
| **8,00** | 8,00 | 63 | 19 | 9,00 | 7,70 | 1,00 | 4 | 80598 | **47,60** |
| **8,00** | 8,00 | 63 | 19 | 9,00 | 7,70 | 1,50 | 4 | 80599 | **47,60** |
| **8,00** | 8,00 | 63 | 19 | 9,00 | 7,70 | 2,00 | 4 | 80600 | **47,60** |
| **10,00** | 10,00 | 72 | 22 | 12,00 | 9,70 | 0,20 | 4 | 22925 | **60,37** |
| **10,00** | 10,00 | 72 | 22 | 12,00 | 9,70 | 0,50 | 4 | 23049 | **60,37** |

| D mm | d mm | L mm | l1 mm | l mm | d1 mm | R mm | Z | N° Art. IKRA | € |
|---|---|---|---|---|---|---|---|---|---|
| **10,00** | 10,00 | 72 | 22 | 12,00 | 9,70 | 1,00 | 4 | 80601 | **60,37** |
| **10,00** | 10,00 | 72 | 22 | 12,00 | 9,70 | 1,50 | 4 | 80602 | **60,37** |
| **10,00** | 10,00 | 72 | 22 | 12,00 | 9,70 | 2,00 | 4 | 80603 | **60,37** |
| **10,00** | 10,00 | 72 | 22 | 12,00 | 9,70 | 3,00 | 4 | 80604 | **60,37** |
| **12,00** | 12,00 | 83 | 26 | 15,00 | 11,70 | 0,30 | 4 | 24207 | **84,04** |
| **12,00** | 12,00 | 83 | 26 | 15,00 | 11,70 | 0,50 | 4 | 24646 | **84,04** |
| **12,00** | 12,00 | 83 | 26 | 15,00 | 11,70 | 1,00 | 4 | 80605 | **84,04** |
| **12,00** | 12,00 | 83 | 26 | 15,00 | 11,70 | 1,50 | 4 | 80606 | **84,04** |
| **12,00** | 12,00 | 83 | 26 | 15,00 | 11,70 | 2,00 | 4 | 80607 | **84,04** |
| **12,00** | 12,00 | 83 | 26 | 15,00 | 11,70 | 3,00 | 4 | 80608 | **84,04** |
| **14,00** | 14,00 | 83 | 29 | 16,00 | 13,50 | 0,30 | 4 | 68611 | **113,72** |
| **14,00** | 14,00 | 83 | 29 | 16,00 | 13,50 | 0,50 | 4 | 68612 | **113,72** |
| **14,00** | 14,00 | 83 | 29 | 16,00 | 13,50 | 1,00 | 4 | 80609 | **113,72** |
| **14,00** | 14,00 | 83 | 29 | 16,00 | 13,50 | 1,50 | 4 | 80610 | **113,72** |
| **14,00** | 14,00 | 83 | 29 | 16,00 | 13,50 | 2,00 | 4 | 80611 | **113,72** |
| **14,00** | 14,00 | 83 | 29 | 16,00 | 13,50 | 3,00 | 4 | 80612 | **113,72** |
| **16,00** | 16,00 | 92 | 32 | 18,00 | 15,70 | 0,30 | 4 | 24852 | **127,60** |
| **16,00** | 16,00 | 92 | 32 | 18,00 | 15,70 | 0,50 | 4 | 25352 | **127,60** |
| **16,00** | 16,00 | 92 | 32 | 18,00 | 15,70 | 1,00 | 4 | 25383 | **127,60** |
| **16,00** | 16,00 | 92 | 32 | 18,00 | 15,70 | 1,50 | 4 | 80613 | **127,60** |
| **16,00** | 16,00 | 92 | 32 | 18,00 | 15,70 | 2,00 | 4 | 80614 | **127,60** |
| **16,00** | 16,00 | 92 | 32 | 18,00 | 15,70 | 3,00 | 4 | 80615 | **127,60** |
| **20,00** | 20,00 | 104 | 38 | 24,00 | 19,70 | 0,30 | 4 | 25514 | **196,50** |
| **20,00** | 20,00 | 104 | 38 | 24,00 | 19,70 | 0,50 | 4 | 25527 | **196,50** |
| **20,00** | 20,00 | 104 | 38 | 24,00 | 19,70 | 1,00 | 4 | 26267 | **196,50** |
| **20,00** | 20,00 | 104 | 38 | 24,00 | 19,70 | 1,50 | 4 | 80616 | **196,50** |
| **20,00** | 20,00 | 104 | 38 | 24,00 | 19,70 | 2,00 | 4 | 80618 | **196,50** |
| **20,00** | 20,00 | 104 | 38 | 24,00 | 19,70 | 3,00 | 4 | 80619 | **196,50** |

**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

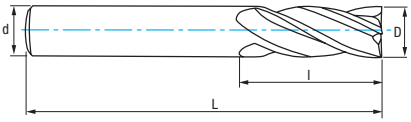



Installations de production modernes

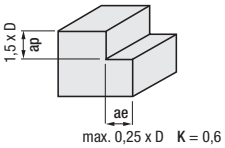
izartool.com/fr

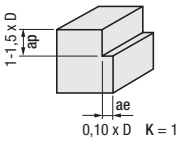
# Ref. 9401

## FRESA METAL DURO 4Z USO GENERAL
General Purpose 4Z Carbide End Mill
Fraise carbure 4Z utilisation générale




| **MD**/HM Carbure Micrograno | CROMAX | DIN 6528 N | | 4 Z | 30° | DIN 6535 HA | Tol. D (h10) d (h6) |
|---|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | CROMAX | Ø 1 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.1 | 100-130 | 125-160 | 0,002 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,150 |
| | P.2 | 90-120 | 112-150 | 0,002 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | P.3 | 50-100 | 60-130 | 0,002 | 0,020 | 0,025 | 0,035 | 0,040 | 0,050 | 0,060 | 0,075 |
| | P.5 | 80-100 | 100-130 | 0,002 | 0,010 | 0,025 | 0,025 | 0,025 | 0,040 | 0,080 | 0,100 |
| M | | 40-60 | 50-80 | 0,002 | 0,010 | 0,025 | 0,025 | 0,025 | 0,040 | 0,080 | 0,100 |
| K | K.1 | 55-70 | 68-95 | 0,008 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | K.2 | 30-50 | 40-60 | 0,008 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| S | | 40-55 | 50-68 | 0,015 | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 |
| N | N.1 | 100-250 | 140-350 | 0,006 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.2 | 100-250 | 140-350 | 0,006 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.3 | 100-300 | 140-420 | 0,005 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.4 | 100-300 | 140-420 | 0,005 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.5 | 90-200 | 100-300 | 0,005 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.6 | 100-200 | 140-280 | 0,002 | 0,020 | 0,030 | 0,030 | 0,040 | 0,050 | 0,100 | 0,150 |
| | N.7 | 50-125 | 70-175 | 0,001 | 0,015 | 0,025 | 0,025 | 0,030 | 0,040 | 0,080 | 0,100 |

**Set**
**pag. 384**

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

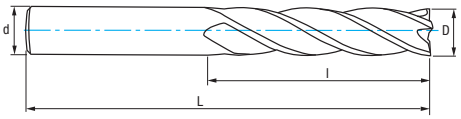
**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| | D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | N° Art. CROMAX | € |
|---|---|---|---|---|---|---|---|---|---|
| | **1,00** | 3,00 | 38 | 3 | 4 | 30475 | **13,67** | 30479 | **19,21** |
| | **1,50** | 3,00 | 38 | 4 | 4 | 30476 | **13,67** | 30480 | **19,21** |
| | **2,00** | 3,00 | 38 | 6 | 4 | 30477 | **13,67** | 30481 | **19,21** |
| | **2,50** | 3,00 | 38 | 8 | 4 | 30478 | **13,67** | 30482 | **19,21** |
| | **3,00** | 3,00 | 38 | 8 | 4 | 28447 | **13,67** | 28551 | **19,21** |
| New! | **3,50** | 3,50 | 50 | 10 | 4 | 21946 | **13,67** | 21945 | **19,21** |
| | **4,00** | 4,00 | 50 | 11 | 4 | 28448 | **13,67** | 28552 | **19,21** |
| New! | **4,50** | 4,50 | 50 | 11 | 4 | 84407 | **13,67** | 84328 | **20,39** |
| | **5,00** | 5,00 | 50 | 13 | 4 | 28449 | **14,86** | 28553 | **20,39** |
| New! | **5,50** | 5,50 | 57 | 13 | 4 | 84408 | **16,07** | 84329 | **21,61** |
| | **6,00** | 6,00 | 57 | 13 | 4 | 28450 | **16,07** | 28554 | **21,61** |
| New! | **6,50** | 6,50 | 60 | 16 | 4 | 84409 | **24,52** | 84330 | **30,89** |
| | **7,00** | 7,00 | 60 | 16 | 4 | 79585 | **24,52** | 79593 | **30,89** |
| New! | **7,50** | 7,50 | 63 | 19 | 4 | 84411 | **25,62** | 84331 | **31,99** |
| | **8,00** | 8,00 | 63 | 19 | 4 | 28451 | **25,62** | 28555 | **31,99** |
| New! | **8,50** | 8,50 | 67 | 19 | 4 | 25253 | **33,63** | 84332 | **40,64** |
| | **9,00** | 9,00 | 67 | 19 | 4 | 79586 | **33,63** | 79594 | **40,64** |
| New! | **9,50** | 9,50 | 72 | 22 | 4 | 84412 | **35,85** | 84333 | **42,86** |
| | **10,00** | 10,00 | 72 | 22 | 4 | 28452 | **35,85** | 28556 | **42,86** |
| | **11,00** | 11,00 | 83 | 26 | 4 | 79588 | **46,90** | 79595 | **54,49** |
| | **12,00** | 12,00 | 83 | 26 | 4 | 28453 | **49,37** | 28557 | **56,96** |
| New! | **13,00** | 13,00 | 83 | 26 | 4 | 79589 | **67,38** | 79596 | **74,31** |
| | **14,00** | 14,00 | 83 | 26 | 4 | 28454 | **73,81** | 28558 | **82,35** |
| | **16,00** | 16,00 | 92 | 32 | 4 | 28455 | **82,38** | 28559 | **92,38** |
| | **18,00** | 18,00 | 92 | 32 | 4 | 28456 | **135,70** | 28560 | **146,96** |
| | **20,00** | 20,00 | 104 | 38 | 4 | 28457 | **146,05** | 28561 | **158,38** |

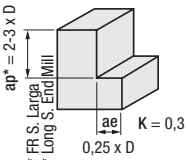
**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

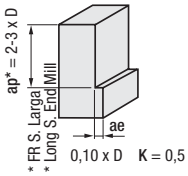
# Ref. 9410

## FRESA METAL DURO 4Z SERIE LARGA USO GENERAL
General Purpose 4Z Long Series Carbide End Mill
Fraise carbure 4Z Série longue utilisation générale




| MD/HM/Carbure Micrograno | CROMAX | IZAR Std. N | | 4 Z | Serie Larga Long Series Série longue | 30° | DIN 6535 HA | Tol. D (h10) d (h6) |
|---|---|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | CROMAX | Ø 1 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.1 | 100-130 | 125-160 | 0,002 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,150 |
| | P.2 | 90-120 | 112-150 | 0,002 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | P.3 | 50-100 | 60-130 | 0,002 | 0,020 | 0,025 | 0,035 | 0,040 | 0,050 | 0,060 | 0,075 |
| | P.5 | 80-100 | 100-130 | 0,002 | 0,010 | 0,025 | 0,025 | 0,025 | 0,040 | 0,080 | 0,100 |
| M | | 40-60 | 50-80 | 0,002 | 0,010 | 0,025 | 0,025 | 0,025 | 0,040 | 0,080 | 0,100 |
| K | K.1 | 55-70 | 68-95 | 0,008 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | K.2 | 30-50 | 40-60 | 0,008 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| S | | 40-55 | 50-68 | 0,015 | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 |
| N | N.1 | 100-250 | 140-350 | 0,006 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.2 | 100-250 | 140-350 | 0,006 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.3 | 100-300 | 140-420 | 0,005 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.4 | 100-300 | 140-420 | 0,005 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.5 | 90-200 | 100-300 | 0,005 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.6 | 100-200 | 140-280 | 0,002 | 0,020 | 0,030 | 0,030 | 0,040 | 0,050 | 0,100 | 0,150 |
| | N.7 | 50-125 | 70-175 | 0,001 | 0,015 | 0,025 | 0,025 | 0,030 | 0,040 | 0,080 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

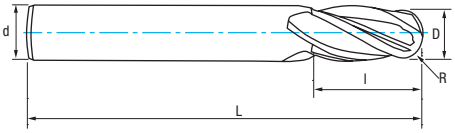
New!

| D mm | d mm | L mm | l mm | Z | Nº Art. MD/HM | € | Nº Art. CROMAX | € |
|---|---|---|---|---|---|---|---|---|
| **3,00** | 3,00 | 75 | 20 | 4 | 28516 | **14,86** | 28727 | **20,39** |
| **4,00** | 4,00 | 75 | 20 | 4 | 28517 | **14,86** | 28728 | **20,39** |
| **5,00** | 5,00 | 75 | 20 | 4 | 28518 | **20,81** | 28729 | **26,36** |
| **6,00** | 6,00 | 100 | 25 | 4 | 28519 | **22,64** | 28730 | **28,75** |
| **8,00** | 8,00 | 100 | 25 | 4 | 28520 | **28,56** | 28731 | **35,57** |
| **10,00** | 10,00 | 100 | 40 | 4 | 28521 | **43,10** | 28732 | **50,80** |
| **12,00** | 12,00 | 100 | 50 | 4 | 28522 | **59,20** | 28733 | **67,57** |
| **12,00** | 12,00 | 150 | 50 | 4 | 34872 | **66,65** | 30485 | **74,35** |
| **14,00** | 14,00 | 100 | 50 | 4 | 28523 | **106,63** | 28734 | **113,73** |
| **14,00** | 14,00 | 150 | 50 | 4 | 34927 | **117,40** | 30486 | **125,09** |
| **16,00** | 16,00 | 100 | 50 | 4 | 28524 | **112,12** | 28735 | **121,35** |
| **16,00** | 16,00 | 150 | 50 | 4 | 34929 | **123,53** | 30505 | **133,50** |
| **18,00** | 18,00 | 125 | 55 | 4 | 28525 | **161,77** | 28736 | **172,14** |
| **18,00** | 18,00 | 150 | 55 | 4 | 34947 | **177,93** | 32036 | **189,36** |
| **20,00** | 20,00 | 125 | 55 | 4 | 28526 | **164,45** | 28737 | **175,82** |
| **20,00** | 20,00 | 150 | 55 | 4 | 35017 | **181,03** | 30509 | **193,40** |

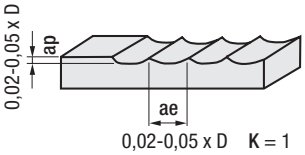
**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

# Ref. 9412

## FRESA METAL DURO 4Z CABEZA ESFÉRICA < 55 HRC
< 55 HRC Ball Nose 4Z Carbide End Mill
Fraise carbure 4Z hémisphérique. < 55 HRC




| MD/HM/Carbure Micrograno | CROMAX | DIN 6528 N | | 4 Z | | 30° | DIN 6535 HA | Tol. D (h10) d (h6) |
|---|---|---|---|---|---|---|---|---|




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | CROMAX | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.1 | 100-130 | 125-160 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,150 |
| | P.2 | 90-120 | 112-150 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | P.3 | 50-100 | 60-130 | 0,020 | 0,025 | 0,035 | 0,040 | 0,050 | 0,060 | 0,075 |
| | P.5 | 80-100 | 100-130 | 0,010 | 0,025 | 0,025 | 0,025 | 0,040 | 0,080 | 0,100 |
| M | | 40-60 | 50-80 | 0,010 | 0,025 | 0,035 | 0,035 | 0,050 | 0,070 | 0,080 |
| K | K.1 | 55-70 | 68-95 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | K.2 | 30-50 | 40-60 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| S | | 40-55 | 50-68 | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 |
| N | N.1 | 100-250 | 140-350 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.2 | 100-250 | 140-350 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.3 | 100-300 | 140-420 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.4 | 100-300 | 140-420 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.5 | 90-200 | 100-300 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.6 | 100-200 | 140-280 | 0,020 | 0,030 | 0,030 | 0,040 | 0,050 | 0,100 | 0,150 |
| | N.7 | 50-125 | 70-175 | 0,015 | 0,025 | 0,025 | 0,030 | 0,040 | 0,080 | 0,100 |

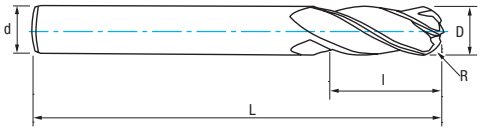
New!

| D mm | R mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | N° Art. CROMAX | € |
|---|---|---|---|---|---|---|---|---|---|
| **3,00** | 1,50 | 3,00 | 38 | 12 | 4 | 28458 | **15,93** | 28705 | **21,47** |
| **4,00** | 2,00 | 4,00 | 50 | 12 | 4 | 28459 | **16,90** | 28706 | **22,43** |
| **5,00** | 2,50 | 5,00 | 50 | 16 | 4 | 28460 | **17,78** | 28707 | **23,31** |
| **6,00** | 3,00 | 6,00 | 57 | 16 | 4 | 28461 | **19,77** | 28708 | **25,30** |
| **8,00** | 4,00 | 8,00 | 63 | 20 | 4 | 28462 | **32,91** | 28709 | **39,28** |
| **10,00** | 5,00 | 10,00 | 72 | 22 | 4 | 28463 | **55,77** | 28710 | **62,78** |
| **12,00** | 6,00 | 12,00 | 83 | 22 | 4 | 28464 | **73,01** | 28711 | **80,60** |
| **14,00** | 7,00 | 14,00 | 83 | 25 | 4 | 28465 | **86,23** | 28712 | **94,77** |
| **16,00** | 8,00 | 16,00 | 92 | 25 | 4 | 28466 | **116,93** | 28713 | **126,93** |
| **20,00** | 10,00 | 20,00 | 104 | 32 | 4 | 28468 | **183,19** | 28715 | **195,51** |

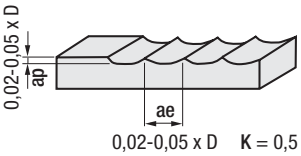
**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

# Ref. 9407

## FRESA METAL DURO 4Z SERIE LARGA CABEZA ESFÉRICA < 55 HRC
< 55 HRC Ball Nose 4Z Long Series Carbide End Mill
Fraise carbure 4Z série longue hémisphérique < 55 HRC




| MD/HM/Carbure Micrograno | CROMAX | DIN 6528 N | | 4 Z | | 30° | DIN 6535 HA | Tol. D (h10) d (h6) | Serie Larga Long Series Série longue |
|---|---|---|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | CROMAX | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.1 | 100-130 | 125-160 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,150 |
| | P.2 | 90-120 | 112-150 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | P.3 | 50-100 | 60-130 | 0,020 | 0,025 | 0,035 | 0,040 | 0,050 | 0,060 | 0,075 |
| | P.5 | 80-100 | 100-130 | 0,010 | 0,025 | 0,025 | 0,025 | 0,040 | 0,080 | 0,100 |
| M | | 40-60 | 50-80 | 0,010 | 0,025 | 0,035 | 0,035 | 0,050 | 0,070 | 0,080 |
| K | K.1 | 55-70 | 68-95 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | K.2 | 30-50 | 40-60 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| S | | 40-55 | 50-68 | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 |
| N | N.1 | 100-250 | 140-350 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.2 | 100-250 | 140-350 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.3 | 100-300 | 140-420 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.4 | 100-300 | 140-420 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.5 | 90-200 | 100-300 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.6 | 100-200 | 140-280 | 0,020 | 0,030 | 0,030 | 0,040 | 0,050 | 0,100 | 0,150 |
| | N.7 | 50-125 | 70-175 | 0,015 | 0,025 | 0,025 | 0,030 | 0,040 | 0,080 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

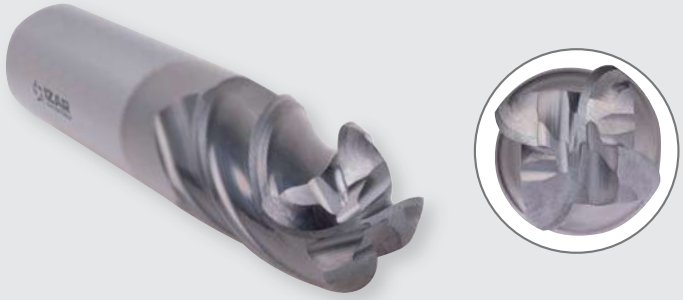
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

New!

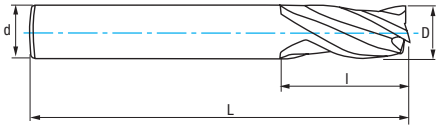
| D mm | R mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | N° Art. CROMAX | € |
|---|---|---|---|---|---|---|---|---|---|
| **3,00** | 1,50 | 3,00 | 75 | 10 | 4 | 28527 | **53,95** | 13157 | **59,48** |
| **4,00** | 2,00 | 4,00 | 75 | 12 | 4 | 28528 | **55,87** | 13158 | **61,40** |
| **5,00** | 2,50 | 5,00 | 75 | 16 | 4 | 28529 | **57,82** | 13160 | **63,38** |
| **6,00** | 3,00 | 6,00 | 100 | 20 | 4 | 28530 | **61,15** | 13161 | **67,26** |
| **8,00** | 4,00 | 8,00 | 100 | 25 | 4 | 28531 | **92,10** | 13162 | **99,11** |
| **10,00** | 5,00 | 10,00 | 100 | 25 | 4 | 28532 | **144,67** | 13164 | **152,38** |
| **12,00** | 6,00 | 12,00 | 100 | 30 | 4 | 28533 | **183,39** | 13184 | **191,76** |
| **14,00** | 7,00 | 14,00 | 100 | 30 | 4 | 28534 | **230,31** | 13200 | **237,42** |
| **16,00** | 8,00 | 16,00 | 100 | 40 | 4 | 28535 | **305,91** | 13208 | **315,15** |
| **20,00** | 10,00 | 20,00 | 125 | 40 | 4 | 28537 | **513,42** | 13330 | **524,80** |

**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

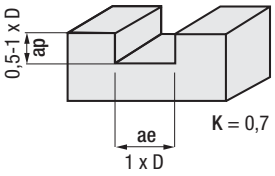


# Ref. 9431

## FRESA METAL DURO SERIE CORTA 3Z USO GENERAL
General Purpose 3Z Short Series Carbide End Mill
Fraise carbure série courte 3Z utilisation générale




**MD**/HM Carbure Micrograno | CROMAX | DIN 6528 N | 3 Z | 30° | DIN 6535 HA | Tol. D (e8) d (h6)




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | CROMAX | Ø 1 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.1 | 100-130 | 125-160 | 0,002 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | P.2 | 90-120 | 112-150 | 0,002 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | P.3 | 50-100 | 60-130 | 0,002 | 0,015 | 0,025 | 0,035 | 0,040 | 0,050 | 0,060 | 0,075 |
| K | K.1 | 55-70 | 68-95 | 0,008 | 0,030 | 0,050 | 0,050 | 0,070 | 0,075 | 0,180 | 0,200 |
| | K.2 | 55-70 | 68-95 | 0,008 | 0,010 | 0,020 | 0,020 | 0,035 | 0,050 | 0,070 | 0,100 |
| S | | 30-50 | 40-70 | 0,002 | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

**K =** Coeficiente corrección / Correction coefficient / Coéficient correction

New!

| | D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | N° Art. CROMAX | € |
|---|---|---|---|---|---|---|---|---|---|
| | 1,00 | 3,00 | 38 | 3 | 3 | 25317 | 13,67 | 30471 | 19,21 |
| | 1,50 | 3,00 | 38 | 4 | 3 | 25318 | 13,67 | 30472 | 19,21 |
| | 2,00 | 3,00 | 38 | 6 | 3 | 25320 | 13,67 | 30473 | 19,21 |
| | 2,50 | 3,00 | 38 | 8 | 3 | 25322 | 13,67 | 30474 | 19,21 |
| | 3,00 | 3,00 | 38 | 8 | 3 | 28432 | 13,67 | 28738 | 19,21 |
| New! | 3,50 | 3,50 | 50 | 7 | 3 | 84413 | 13,67 | 84359 | 19,21 |
| | 4,00 | 4,00 | 50 | 8 | 3 | 28433 | 13,67 | 28739 | 19,21 |
| New! | 4,50 | 4,50 | 50 | 8 | 3 | 84414 | 14,86 | 84367 | 20,39 |
| | 5,00 | 5,00 | 50 | 10 | 3 | 28434 | 14,86 | 28740 | 20,39 |
| New! | 5,50 | 5,50 | 57 | 10 | 3 | 84415 | 16,07 | 84368 | 21,61 |
| | 6,00 | 6,00 | 57 | 10 | 3 | 28435 | 16,07 | 28741 | 21,61 |
| New! | 6,50 | 6,50 | 60 | 13 | 3 | 84416 | 24,52 | 84369 | 30,89 |
| | 7,00 | 7,00 | 60 | 13 | 3 | 28436 | 24,52 | 28742 | 30,89 |
| New! | 7,50 | 7,50 | 63 | 16 | 3 | 84417 | 25,62 | 84390 | 31,99 |
| | 8,00 | 8,00 | 63 | 16 | 3 | 28438 | 25,62 | 28743 | 31,99 |
| New! | 8,50 | 8,50 | 67 | 16 | 3 | 84418 | 33,63 | 84396 | 40,64 |
| | 9,00 | 9,00 | 67 | 16 | 3 | 28437 | 33,63 | 28744 | 40,64 |
| New! | 9,50 | 9,50 | 72 | 19 | 3 | 84419 | 35,85 | 84397 | 42,86 |
| | 10,00 | 10,00 | 72 | 19 | 3 | 28439 | 35,85 | 28745 | 42,86 |
| | 12,00 | 12,00 | 83 | 22 | 3 | 28440 | 49,37 | 28746 | 56,96 |
| | 14,00 | 14,00 | 83 | 22 | 3 | 28441 | 73,81 | 28747 | 82,33 |
| | 16,00 | 16,00 | 92 | 26 | 3 | 28443 | 82,38 | 28748 | 92,40 |
| | 18,00 | 18,00 | 92 | 26 | 3 | 28444 | 135,70 | 28749 | 146,96 |
| | 20,00 | 20,00 | 104 | 32 | 3 | 28445 | 146,05 | 28750 | 158,37 |

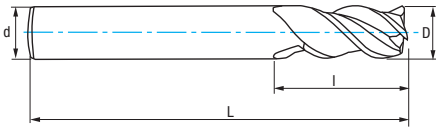
6 Pcs

| Cont. Ø | N° Art. CROMAX | € |
|---|---|---|
| 4-5-6-8-10-12 mm | 67686 | Set Price! 183,37 |

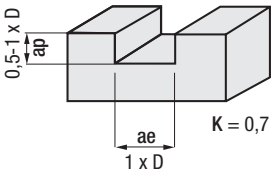
DIN 6535 HB
**Bajo demanda** / upon request / sur demande

# Ref. 9436

## FRESA METAL DURO SERIE CORTA 3Z INOX 45°
45° Stainless 3Z Short Series Carbide End Mill
Fraise carbure série courte 3Z inox 45°




| MD/HM Carbure Micrograno | CROMAX | DIN 6528 W | | 3 Z | | 45° | DIN 6535 HA | Tol. D (e8) d (h6) |
|---|---|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | CROMAX | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.1 | 125-160 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | P.2 | 112-150 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | P.5 | 55-110 | 0,010 | 0,025 | 0,025 | 0,035 | 0,050 | 0,080 | 0,100 |
| M | | 50-80 | 0,010 | 0,025 | 0,025 | 0,035 | 0,050 | 0,070 | 0,080 |
| N | N.1 | 84-140 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,085 | 0,125 |
| | N.2 | 140-350 | 0,025 | 0,050 | 0,050 | 0,050 | 0,050 | 0,080 | 0,120 |
| | N.3 | 140-420 | 0,010 | 0,050 | 0,050 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.4 | 140-420 | 0,010 | 0,050 | 0,050 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.5 | 100-300 | 0,010 | 0,050 | 0,050 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.6 | 140-280 | 0,020 | 0,030 | 0,030 | 0,040 | 0,050 | 0,100 | 0,150 |
| | N.7 | 70-175 | 0,015 | 0,025 | 0,025 | 0,030 | 0,040 | 0,080 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

K = Coeficiente corrección
Correction coefficient
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. CROMAX | € |
|---|---|---|---|---|---|---|
| **3,00** | 3,00 | 38 | 8 | 3 | 30096 | **20,06** |
| **4,00** | 4,00 | 50 | 8 | 3 | 30097 | **20,06** |
| **5,00** | 5,00 | 50 | 10 | 3 | 30098 | **21,29** |
| **6,00** | 6,00 | 57 | 10 | 3 | 30099 | **22,48** |
| **7,00** | 7,00 | 60 | 13 | 3 | 30100 | **27,49** |
| **8,00** | 8,00 | 63 | 16 | 3 | 30101 | **32,51** |
| **9,00** | 9,00 | 67 | 16 | 3 | 30102 | **37,96** |
| **10,00** | 10,00 | 72 | 19 | 3 | 30103 | **43,40** |
| **12,00** | 12,00 | 83 | 22 | 3 | 30104 | **62,53** |
| **14,00** | 14,00 | 83 | 22 | 3 | 30105 | **83,48** |
| **16,00** | 16,00 | 92 | 26 | 3 | 30106 | **104,41** |
| **18,00** | 18,00 | 92 | 26 | 3 | 30107 | **133,68** |
| **20,00** | 20,00 | 104 | 32 | 3 | 30108 | **162,96** |

DIN 6535 HB
**Bajo demanda** / upon request / sur demande

New!

IRIS

# IRIS, UN PASO MÁS EN EL MECANIZADO DE MATERIALES NO FERROSOS

## IRIS, the Next Level of Machining Non-Ferrous Materials

## IRIS, le niveau suivant dans l'usinage des matériaux non ferreux

**Dureza extrema**
Extreme Hardness
Extrême dureté

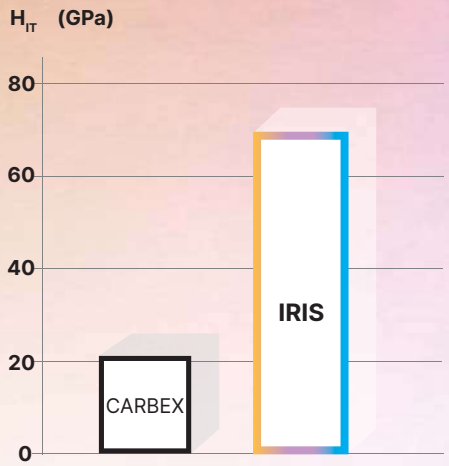
**Super suave**
Super Smoothness
Super lissage

**Recubrimiento super fino**
Super Thin Coating
Revêtement ultra-fin

**Permite el reacondicionamiento**
Enable Reconditioning
Permettre le reconditionnement

### MEJORA DE PROPIEDADES
Property Enhancement
Amélioration des propriétés

| | | |
|---|---|---|
| - **Excelente adhesión** | - Excellent adhesion | - Excellente adhérence |
| - **Superficies más suaves** | - Smoother surfaces | - Surfaces plus lisses |
| - **Mayores durezas** | - Increased hardness | - Dureté accrue |




| **Base Carbono ta-C**<br>**Carbon ta-C Base**<br>Base Carbone ta-C | |
|---|---|
| **Dureza /** Hardness / Dureté **HV(0,05)** | **> 6500** |
| **Oxidación** / Oxidation / Oxidation | **> 500°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient/Coéficient Friction | **0,30-1,50** |
| **Color /** Colour / Couleur:<br>**Arco Iris /** Rainbow / Arc-en-ciel | |

**Con una dureza de 60-70 GPa, IRIS alcanza más del doble de dureza que el recubrimiento actual CARBEX**

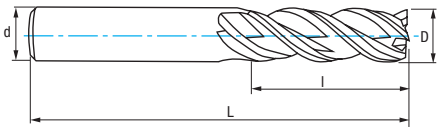
With a hardness of 60-70 GPa, IRIS achieves more than double the hardness of the current coating, CARBEX

Avec une dureté de 60-70 GPa, IRIS atteint plus du double de la dureté du revêtement actuel CARBEX

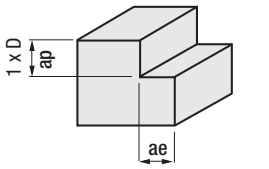

Ref. 9437 **Pag. 341**
Ref. 9439 **Pag. 342**
Ref. 9427 **Pag. 346**
Ref. 9429 **Pag. 347**
Ref. 9441 **Pag. 356**
Ref. 9416 **Pag. 357**
Ref. 9417 **Pag. 358**
Ref. 9456 **Pag. 359**

# Ref. 9437

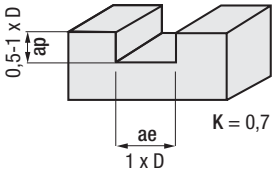
## FRESA METAL DURO 3Z ALUMINIO PULIDO ESPEJO 45°
Mirror Polished 45° Aluminium 3Z Carbide End Mill
Fraise carbure 3Z aluminium 45° polyglass




| MD/HM Carbure Micrograno+ | IRIS | IZAR Std. | | 3 Z | 45° | DIN 6535 HA | Tol. D (h10) d (h6) | Pulido Espejo Mirror Polished Polyglass |
|---|---|---|---|---|---|---|---|---|




0,30 x D K = 0,6
0,05-0,10 x D K = 1




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| N | N.1 | 180-250 | 0,020 | 0,040 | 0,040 | 0,060 | 0,060 | 0,080 | 0,120 |
| | N.2 | 180-250 | 0,020 | 0,040 | 0,040 | 0,060 | 0,060 | 0,080 | 0,120 |
| | N.3 | 350-500 | 0,035 | 0,060 | 0,060 | 0,070 | 0,070 | 0,090 | 0,120 |
| | N.4 | 350-450 | 0,035 | 0,060 | 0,060 | 0,070 | 0,070 | 0,090 | 0,120 |
| | N.5 | 190-290 | 0,035 | 0,050 | 0,050 | 0,070 | 0,070 | 0,090 | 0,120 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** **Coeficiente corrección** / **Correction coefficient** / Coéficient correction

| | D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | New! N° Art. IRIS | € |
|---|---|---|---|---|---|---|---|---|---|
| New! | **3,00** | 6,00 | 50 | 8 | 3 | 83749 | **28,95** | 30507 | **36,19** |
| | **4,00** | 6,00 | 50 | 12 | 3 | 77214 | **28,96** | 30511 | **36,20** |
| New! | **5,00** | 6,00 | 50 | 13 | 3 | 83750 | **32,18** | 30512 | **40,22** |
| | **6,00** | 6,00 | 50 | 15 | 3 | 77215 | **32,18** | 30515 | **40,22** |
| New! | **7,00** | 8,00 | 60 | 18 | 3 | 83751 | **48,27** | 30525 | **60,34** |
| | **8,00** | 8,00 | 60 | 20 | 3 | 77216 | **48,27** | 30529 | **60,34** |
| New! | **9,00** | 10,00 | 75 | 23 | 3 | 83752 | **63,44** | 30530 | **79,30** |
| | **10,00** | 10,00 | 75 | 30 | 3 | 77217 | **63,45** | 30531 | **79,31** |
| | **12,00** | 12,00 | 75 | 30 | 3 | 77218 | **86,88** | 30535 | **108,60** |
| | **16,00** | 16,00 | 100 | 40 | 3 | 77219 | **133,32** | 30506 | **166,65** |
| New! | **18,00** | 20,00 | 100 | 40 | 3 | 31015 | **204,74** | 31561 | **255,93** |
| New! | **20,00** | 20,00 | 100 | 45 | 3 | 31016 | **220,65** | 31562 | **275,81** |

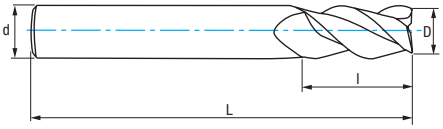
**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

- **Diseño especial del canal para una óptima evacuación de la viruta.**
- **Permite avances elevados y mejores acabados en altas velocidades.**
- **Special wide-space flute design for an excellent chip extraction.**
- **Suitable for high feeds. Better finishing surface at high speed machining.**
- Conception spéciale des goujures avec grand espace pour une excellente extraction des copeaux.
- Il permet des avancées élevées et meilleures finitions à grande vitesse.

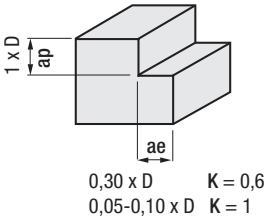
Video

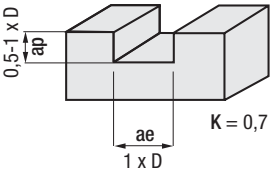
# Ref. 9439

## FRESA METAL DURO 3Z ALUMINIO PULIDO ESPEJO 45°
Mirror Polished 45° Aluminium 3Z Carbide End Mill
Fraise carbure 3Z aluminium 45° polyglass




| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **MD**/HM Carbure Micrograno+ | IRIS | DIN 6528 W | | 3 Z | 45° | DIN 6535 HA | Tol. D (h10) d (h6) | **Pulido Espejo** Mirror Polished Polyglass |




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| N | N.1 | 180-250 | 0,020 | 0,040 | 0,040 | 0,060 | 0,060 | 0,080 | 0,120 |
| | N.2 | 180-250 | 0,020 | 0,040 | 0,040 | 0,060 | 0,060 | 0,080 | 0,120 |
| | N.3 | 350-500 | 0,035 | 0,060 | 0,060 | 0,070 | 0,070 | 0,090 | 0,120 |
| | N.4 | 350-450 | 0,035 | 0,060 | 0,060 | 0,070 | 0,070 | 0,090 | 0,120 |
| | N.5 | 190-290 | 0,035 | 0,050 | 0,050 | 0,070 | 0,070 | 0,090 | 0,120 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

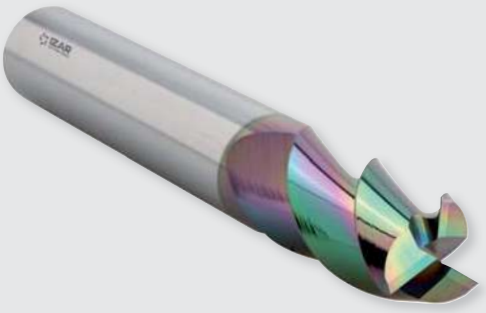
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | N° Art. IRIS | € |
|---|---|---|---|---|---|---|---|---|
| **3,00** | 3,00 | 38 | 8 | 3 | 30438 | **24,61** | 59189 | **30,76** |
| **4,00** | 4,00 | 50 | 8 | 3 | 30439 | **24,61** | 59192 | **30,76** |
| **5,00** | 5,00 | 50 | 10 | 3 | 30440 | **24,61** | 59789 | **30,76** |
| **6,00** | 6,00 | 57 | 10 | 3 | 30442 | **27,35** | 59790 | **34,19** |
| **8,00** | 8,00 | 63 | 16 | 3 | 30443 | **41,02** | 59791 | **51,28** |
| **10,00** | 10,00 | 72 | 19 | 3 | 30445 | **53,92** | 59793 | **67,40** |
| **12,00** | 12,00 | 83 | 22 | 3 | 30446 | **73,86** | 59795 | **92,33** |
| **16,00** | 16,00 | 92 | 26 | 3 | 30447 | **113,32** | 59797 | **141,66** |
| **20,00** | 20,00 | 104 | 32 | 3 | 30452 | **187,17** | 59806 | **233,96** |

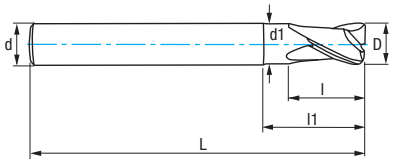
New!

**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

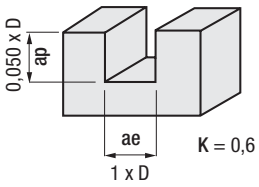


# Ref. 9460

## FRESA METAL DURO 2Z TÓRICA 48-70 HRC
48-70 HRC Radius 2Z Carbide End Mill
Fraise carbure 2Z torique 48-70 HRC




| **MD**/HM Carbure Grano UF | IKRA | DIN 6528 N | | 2 Z | R | DIN 6535 HA |
|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | IKRA | Ø 1 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.2 | 130-160 | 0,008 | 0,025 | 0,037 | 0,047 | 0,057 | 0,065 | 0,075 | 0,085 |
| | P.3 | 100-130 | 0,007 | 0,024 | 0,033 | 0,043 | 0,051 | 0,060 | 0,070 | 0,078 |
| | P.4 | 60-90 | 0,006 | 0,024 | 0,033 | 0,043 | 0,051 | 0,060 | 0,070 | 0,078 |
| H | | 40-70 | 0,003 | 0,012 | 0,017 | 0,020 | 0,025 | 0,030 | 0,035 | 0,040 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

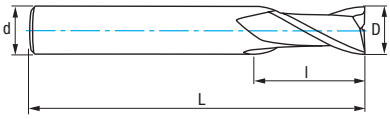
| D mm | d mm | L mm | l1 mm | l mm | d1 mm | R mm | Z | N° Art. IKRA | € |
|---|---|---|---|---|---|---|---|---|---|
| **1,00** | 3,00 | 38 | 3 | 1,50 | | 0,10 | 2 | 26943 | **32,19** |
| **1,50** | 3,00 | 38 | 4 | 2,20 | | 0,10 | 2 | 27148 | **32,19** |
| **2,00** | 3,00 | 38 | 6 | 3,00 | 1,95 | 0,10 | 2 | 27530 | **32,19** |
| **2,50** | 3,00 | 38 | 8 | 4,00 | 2,40 | 0,10 | 2 | 27531 | **32,19** |
| **3,00** | 3,00 | 38 | 8 | 4,00 | 2,85 | 0,10 | 2 | 27533 | **32,19** |
| **3,00** | 3,00 | 38 | 8 | 4,00 | 2,85 | 0,20 | 2 | 80620 | **32,19** |
| **3,00** | 3,00 | 38 | 8 | 4,00 | 2,85 | 0,50 | 2 | 80621 | **32,19** |
| **4,00** | 4,00 | 50 | 11 | 5,00 | 3,85 | 0,10 | 2 | 27534 | **32,19** |
| **4,00** | 4,00 | 50 | 11 | 5,00 | 3,85 | 0,20 | 2 | 80622 | **32,19** |
| **4,00** | 4,00 | 50 | 11 | 5,00 | 3,85 | 0,50 | 2 | 80623 | **32,19** |
| **4,00** | 4,00 | 50 | 11 | 5,00 | 3,85 | 1,00 | 2 | 80624 | **32,19** |
| **5,00** | 5,00 | 50 | 13 | 6,00 | 4,85 | 0,20 | 2 | 28202 | **32,19** |
| **5,00** | 5,00 | 50 | 13 | 6,00 | 4,85 | 0,50 | 2 | 80625 | **32,19** |
| **5,00** | 5,00 | 50 | 13 | 6,00 | 4,85 | 1,00 | 2 | 80626 | **32,19** |
| **6,00** | 6,00 | 57 | 13 | 7,00 | 5,85 | 0,20 | 2 | 28337 | **34,56** |
| **6,00** | 6,00 | 57 | 13 | 7,00 | 5,85 | 0,50 | 2 | 28469 | **34,56** |
| **6,00** | 6,00 | 57 | 13 | 7,00 | 5,85 | 1,00 | 2 | 80627 | **34,56** |
| **6,00** | 6,00 | 57 | 13 | 7,00 | 5,85 | 1,50 | 2 | 80628 | **34,56** |
| **6,00** | 6,00 | 57 | 13 | 7,00 | 5,85 | 2,00 | 2 | 80629 | **34,56** |
| **8,00** | 8,00 | 63 | 19 | 9,00 | 7,70 | 0,20 | 2 | 28496 | **47,60** |
| **8,00** | 8,00 | 63 | 19 | 9,00 | 7,70 | 0,50 | 2 | 28511 | **47,60** |
| **8,00** | 8,00 | 63 | 19 | 9,00 | 7,70 | 1,00 | 2 | 80630 | **47,60** |
| **8,00** | 8,00 | 63 | 19 | 9,00 | 7,70 | 1,50 | 2 | 80631 | **47,60** |
| **8,00** | 8,00 | 63 | 19 | 9,00 | 7,70 | 2,00 | 2 | 80632 | **47,60** |

| D mm | d mm | L mm | l1 mm | l mm | d1 mm | R mm | Z | N° Art. IKRA | € |
|---|---|---|---|---|---|---|---|---|---|
| **10,00** | 10,00 | 72 | 22 | 12,00 | 9,70 | 0,20 | 2 | 28677 | **60,37** |
| **10,00** | 10,00 | 72 | 22 | 12,00 | 9,70 | 0,50 | 2 | 28679 | **60,37** |
| **10,00** | 10,00 | 72 | 22 | 12,00 | 9,70 | 1,00 | 2 | 80633 | **60,37** |
| **10,00** | 10,00 | 72 | 22 | 12,00 | 9,70 | 1,50 | 2 | 80634 | **60,37** |
| **10,00** | 10,00 | 72 | 22 | 12,00 | 9,70 | 2,00 | 2 | 80635 | **60,37** |
| **10,00** | 10,00 | 72 | 22 | 12,00 | 9,70 | 3,00 | 2 | 80637 | **60,37** |
| **12,00** | 12,00 | 83 | 26 | 15,00 | 11,70 | 0,30 | 2 | 28680 | **84,04** |
| **12,00** | 12,00 | 83 | 26 | 15,00 | 11,70 | 0,50 | 2 | 30135 | **84,04** |
| **12,00** | 12,00 | 83 | 26 | 15,00 | 11,70 | 1,00 | 2 | 80638 | **84,04** |
| **12,00** | 12,00 | 83 | 26 | 15,00 | 11,70 | 1,50 | 2 | 80639 | **84,04** |
| **12,00** | 12,00 | 83 | 26 | 15,00 | 11,70 | 2,00 | 2 | 80640 | **84,04** |
| **12,00** | 12,00 | 83 | 26 | 15,00 | 11,70 | 3,00 | 2 | 80641 | **84,04** |
| **16,00** | 16,00 | 92 | 32 | 18,00 | 15,70 | 0,30 | 2 | 30422 | **127,60** |
| **16,00** | 16,00 | 92 | 32 | 18,00 | 15,70 | 0,50 | 2 | 30423 | **127,60** |
| **16,00** | 16,00 | 92 | 32 | 18,00 | 15,70 | 1,00 | 2 | 30424 | **127,60** |
| **16,00** | 16,00 | 92 | 32 | 18,00 | 15,70 | 1,50 | 2 | 80642 | **127,60** |
| **16,00** | 16,00 | 92 | 32 | 18,00 | 15,70 | 2,00 | 2 | 80643 | **127,60** |
| **16,00** | 16,00 | 92 | 32 | 18,00 | 15,70 | 3,00 | 2 | 80644 | **127,60** |
| **20,00** | 20,00 | 104 | 38 | 24,00 | 19,70 | 0,30 | 2 | 30425 | **196,50** |
| **20,00** | 20,00 | 104 | 38 | 24,00 | 19,70 | 0,50 | 2 | 30426 | **196,50** |
| **20,00** | 20,00 | 104 | 38 | 24,00 | 19,70 | 1,00 | 2 | 30427 | **196,50** |
| **20,00** | 20,00 | 104 | 38 | 24,00 | 19,70 | 1,50 | 2 | 80645 | **196,50** |
| **20,00** | 20,00 | 104 | 38 | 24,00 | 19,70 | 2,00 | 2 | 80646 | **196,50** |
| **20,00** | 20,00 | 104 | 38 | 24,00 | 19,70 | 3,00 | 2 | 80647 | **196,50** |

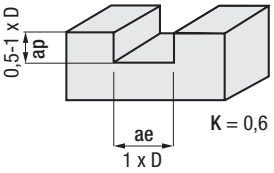
**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

# Ref. 9421

## FRESA METAL DURO 2Z USO GENERAL
General Purpose 2Z Carbide End Mill
Fraise carbure 2Z utilisation générale




**MD**/HM/Carbure Micrograno | CROMAX | DIN 6528 N | 2 Z | 30° | DIN 6535 HA | Tol. D (e8) d (h6)




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | CROMAX | Ø 1 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.1 | 100-130 | 125-160 | 0,002 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,150 |
| | P.2 | 90-120 | 112-150 | 0,002 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | P.3 | 50-100 | 60-130 | 0,002 | 0,020 | 0,025 | 0,035 | 0,040 | 0,050 | 0,060 | 0,075 |
| | P.5 | 80-100 | 100-130 | 0,002 | 0,010 | 0,025 | 0,025 | 0,025 | 0,040 | 0,080 | 0,100 |
| M | | 40-60 | 50-80 | 0,002 | 0,010 | 0,025 | 0,035 | 0,035 | 0,050 | 0,070 | 0,080 |
| K | K.1 | 55-70 | 68-95 | 0,008 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | K.2 | 30-50 | 40-60 | 0,008 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| S | | 40-55 | 50-68 | 0,0015 | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 |
| N | N.1 | 100-250 | 140-350 | 0,006 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.2 | 100-250 | 140-350 | 0,006 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.3 | 100-300 | 140-420 | 0,005 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.4 | 100-300 | 140-420 | 0,005 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.5 | 90-200 | 100-300 | 0,005 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.6 | 100-200 | 140-280 | 0,002 | 0,020 | 0,030 | 0,030 | 0,040 | 0,050 | 0,100 | 0,150 |
| | N.7 | 50-125 | 70-175 | 0,001 | 0,015 | 0,025 | 0,025 | 0,030 | 0,040 | 0,080 | 0,100 |

**Set** pag. 385

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

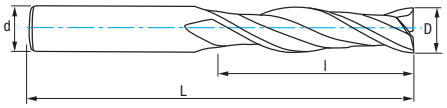
**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| | D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | N° Art. CROMAX | € |
|---|---|---|---|---|---|---|---|---|---|
| | **1,00** | 3,00 | 38 | 3 | 2 | 33593 | **13,67** | 36198 | **19,21** |
| | **1,50** | 3,00 | 38 | 4 | 2 | 33610 | **13,67** | 36199 | **19,21** |
| | **2,00** | 3,00 | 38 | 6 | 2 | 33620 | **13,67** | 36200 | **19,21** |
| | **2,50** | 3,00 | 38 | 8 | 2 | 36197 | **13,67** | 36201 | **19,21** |
| | **3,00** | 3,00 | 38 | 8 | 2 | 28410 | **13,67** | 28562 | **19,21** |
| New! | **3,50** | 3,50 | 50 | 7 | 2 | 84422 | **13,67** | 84398 | **19,21** |
| | **4,00** | 4,00 | 50 | 8 | 2 | 28411 | **13,67** | 28563 | **19,21** |
| New! | **4,50** | 4,50 | 50 | 8 | 2 | 84423 | **14,86** | 84399 | **20,39** |
| | **5,00** | 5,00 | 50 | 10 | 2 | 28412 | **14,86** | 28564 | **20,39** |
| New! | **5,50** | 5,50 | 57 | 10 | 2 | 84424 | **16,07** | 84400 | **21,61** |
| | **6,00** | 6,00 | 57 | 10 | 2 | 28413 | **16,07** | 28565 | **21,61** |
| New! | **6,50** | 6,50 | 60 | 13 | 2 | 84425 | **24,52** | 84401 | **30,89** |
| New! | **7,00** | 7,00 | 60 | 13 | 2 | 84430 | **24,52** | 84402 | **30,89** |
| New! | **7,50** | 7,50 | 63 | 16 | 2 | 84426 | **25,62** | 84403 | **31,99** |
| | **8,00** | 8,00 | 63 | 16 | 2 | 28414 | **25,61** | 28566 | **31,99** |
| New! | **8,50** | 8,50 | 67 | 16 | 2 | 84427 | **33,63** | 84404 | **40,64** |
| New! | **9,00** | 9,00 | 67 | 16 | 2 | 84428 | **33,63** | 84405 | **40,64** |
| New! | **9,50** | 9,50 | 72 | 19 | 2 | 84429 | **35,85** | 84406 | **42,86** |
| | **10,00** | 10,00 | 72 | 19 | 2 | 28415 | **35,85** | 28567 | **42,86** |
| | **12,00** | 12,00 | 83 | 22 | 2 | 28416 | **49,37** | 28568 | **56,96** |
| | **14,00** | 14,00 | 83 | 22 | 2 | 28417 | **73,81** | 28569 | **82,33** |
| | **16,00** | 16,00 | 92 | 26 | 2 | 28418 | **82,38** | 28570 | **92,40** |
| | **18,00** | 18,00 | 92 | 26 | 2 | 28420 | **135,70** | 28571 | **146,96** |
| | **20,00** | 20,00 | 104 | 32 | 2 | 28421 | **146,04** | 28572 | **158,37** |

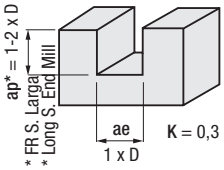
DIN 6535 HB
**Bajo demanda** / upon request / sur demande

# Ref. 9424

## FRESA METAL DURO SERIE LARGA 2Z USO GENERAL
General Purpose 2Z Long Series Carbide End Mill
Fraise carbure série longue 2Z utilisation générale




| MD/HM/Carbure Micrograno | CROMAX | IZAR Std. N | | 2 Z | 30° | DIN 6535 HA | Tol. D (e8) d (h6) | Serie Larga Long Series Série Longue |
|---|---|---|---|---|---|---|---|---|




| Material Grupo | Sub. | Vc (m/min) MD/HM/Carb. | CROMAX | Avances fz/rev. (mm/z) - Feed - Pas Ø 1 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P | P.1 | 100-130 | 125-160 | 0,002 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,150 |
| | P.2 | 90-120 | 112-150 | 0,002 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | P.3 | 50-100 | 60-130 | 0,002 | 0,020 | 0,025 | 0,035 | 0,040 | 0,050 | 0,060 | 0,075 |
| | P.5 | 80-100 | 100-130 | 0,002 | 0,010 | 0,025 | 0,025 | 0,025 | 0,040 | 0,080 | 0,100 |
| M | | 40-60 | 50-80 | 0,002 | 0,010 | 0,025 | 0,035 | 0,035 | 0,050 | 0,070 | 0,080 |
| K | K.1 | 55-70 | 68-95 | 0,008 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | K.2 | 30-50 | 40-60 | 0,008 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| S | | 40-55 | 50-68 | 0,0015 | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 |
| N | N.1 | 100-250 | 140-350 | 0,006 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.2 | 100-250 | 140-350 | 0,006 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.3 | 100-300 | 140-420 | 0,005 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.4 | 100-300 | 140-420 | 0,005 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.5 | 90-200 | 100-300 | 0,005 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.6 | 100-200 | 140-280 | 0,002 | 0,020 | 0,030 | 0,030 | 0,040 | 0,050 | 0,100 | 0,150 |
| | N.7 | 50-125 | 70-175 | 0,001 | 0,015 | 0,025 | 0,025 | 0,030 | 0,040 | 0,080 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

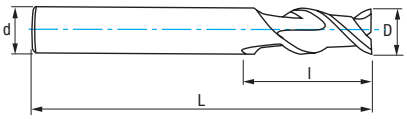
New!

| D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | N° Art. CROMAX | € |
|---|---|---|---|---|---|---|---|---|
| **3,00** | 3,00 | 75 | 20 | 2 | 28387 | **14,86** | 28716 | **20,39** |
| **4,00** | 4,00 | 75 | 20 | 2 | 28388 | **14,86** | 28717 | **20,39** |
| **5,00** | 5,00 | 75 | 20 | 2 | 28497 | **20,81** | 28718 | **26,35** |
| **6,00** | 6,00 | 100 | 25 | 2 | 28498 | **22,64** | 28719 | **28,75** |
| **8,00** | 8,00 | 100 | 25 | 2 | 28499 | **28,56** | 28720 | **35,56** |
| **10,00** | 10,00 | 100 | 40 | 2 | 28500 | **43,10** | 28721 | **50,79** |
| **12,00** | 12,00 | 100 | 50 | 2 | 28501 | **59,20** | 28722 | **67,59** |
| **12,00** | 12,00 | 150 | 50 | 2 | 81512 | **66,65** | 36202 | **74,35** |
| **14,00** | 14,00 | 100 | 50 | 2 | 28502 | **106,63** | 28723 | **113,74** |
| **14,00** | 14,00 | 150 | 50 | 2 | 36360 | **117,40** | 36203 | **125,11** |
| **16,00** | 16,00 | 100 | 50 | 2 | 28503 | **112,12** | 28724 | **121,36** |
| **16,00** | 16,00 | 150 | 50 | 2 | 36362 | **123,53** | 36204 | **133,50** |
| **18,00** | 18,00 | 125 | 55 | 2 | 28504 | **161,77** | 28725 | **172,15** |
| **18,00** | 18,00 | 150 | 55 | 2 | 36363 | **177,93** | 36205 | **189,36** |
| **20,00** | 20,00 | 125 | 55 | 2 | 28505 | **164,45** | 28726 | **175,82** |
| **20,00** | 20,00 | 150 | 55 | 2 | 36370 | **181,03** | 36206 | **193,39** |

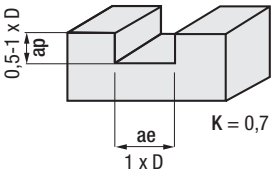
**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

# Ref. 9427

## FRESA METAL DURO 2Z 45° ALUMINIO
45° Aluminium 2Z Carbide End Mill
Fraise carbure 2Z aluminium 45°




| **MD**/HM Carbure Micrograno+ | IRIS | IZAR Std. W | | 2 Z | 45° | DIN 6535 HA | Tol. D (e8) d (h6) |
|---|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| N | N.1 | 180-250 | 0,010 | 0,020 | 0,040 | 0,040 | 0,060 | 0,060 | 0,080 | 0,120 |
| | N.2 | 180-250 | 0,010 | 0,020 | 0,040 | 0,040 | 0,060 | 0,060 | 0,080 | 0,120 |
| | N.3 | 350-500 | 0,018 | 0,035 | 0,060 | 0,060 | 0,070 | 0,070 | 0,090 | 0,120 |
| | N.4 | 350-450 | 0,018 | 0,035 | 0,060 | 0,060 | 0,070 | 0,070 | 0,090 | 0,120 |
| | N.5 | 190-290 | 0,018 | 0,035 | 0,050 | 0,050 | 0,070 | 0,070 | 0,090 | 0,120 |

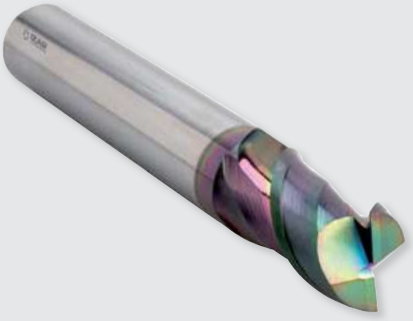
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

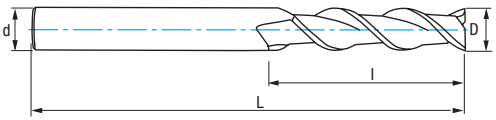
| D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | New! N° Art. IRIS | € |
|---|---|---|---|---|---|---|---|---|
| **2,00** | 3,00 | 38 | 8 | 2 | 30453 | **24,61** | 59808 | **30,76** |
| **3,00** | 3,00 | 38 | 8 | 2 | 30454 | **24,61** | 59810 | **30,76** |
| **4,00** | 4,00 | 50 | 8 | 2 | 30455 | **24,61** | 59811 | **30,76** |
| **5,00** | 5,00 | 50 | 10 | 2 | 30456 | **24,61** | 59814 | **30,76** |
| **6,00** | 6,00 | 57 | 10 | 2 | 30461 | **27,35** | 59815 | **34,19** |
| **8,00** | 8,00 | 63 | 16 | 2 | 30463 | **41,02** | 59816 | **51,28** |
| **10,00** | 10,00 | 72 | 19 | 2 | 30464 | **53,92** | 59817 | **67,40** |
| **12,00** | 12,00 | 83 | 22 | 2 | 30465 | **73,86** | 59819 | **92,33** |
| **16,00** | 16,00 | 92 | 26 | 2 | 30466 | **113,32** | 59828 | **141,66** |
| **20,00** | 20,00 | 104 | 32 | 2 | 30468 | **187,17** | 59832 | **233,96** |

**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

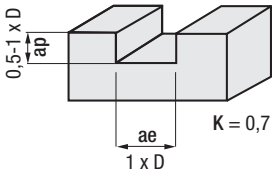


# Ref. 9429

## FRESA METAL DURO SERIE LARGA 2Z 45° ALUMINIO
45° Aluminium 2Z Long Series Carbide End Mill
Fraise carbure série longue 2Z aluminium 45°




| MD/HM Carbure Micrograno+ | IRIS | IZAR Std. W | | 2 Z | 45° | DIN 6535 HA | Tol. D (e8) d (h6) | Serie Larga Long Series Série Longue |
|---|---|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| N | N.1 | 180-250 | 0,010 | 0,020 | 0,040 | 0,040 | 0,060 | 0,060 | 0,080 | 0,120 |
| | N.2 | 180-250 | 0,010 | 0,020 | 0,040 | 0,040 | 0,060 | 0,060 | 0,080 | 0,120 |
| | N.3 | 350-500 | 0,018 | 0,035 | 0,060 | 0,060 | 0,070 | 0,070 | 0,090 | 0,120 |
| | N.4 | 350-450 | 0,018 | 0,035 | 0,060 | 0,060 | 0,070 | 0,070 | 0,090 | 0,120 |
| | N.5 | 190-290 | 0,018 | 0,035 | 0,050 | 0,050 | 0,070 | 0,070 | 0,090 | 0,120 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

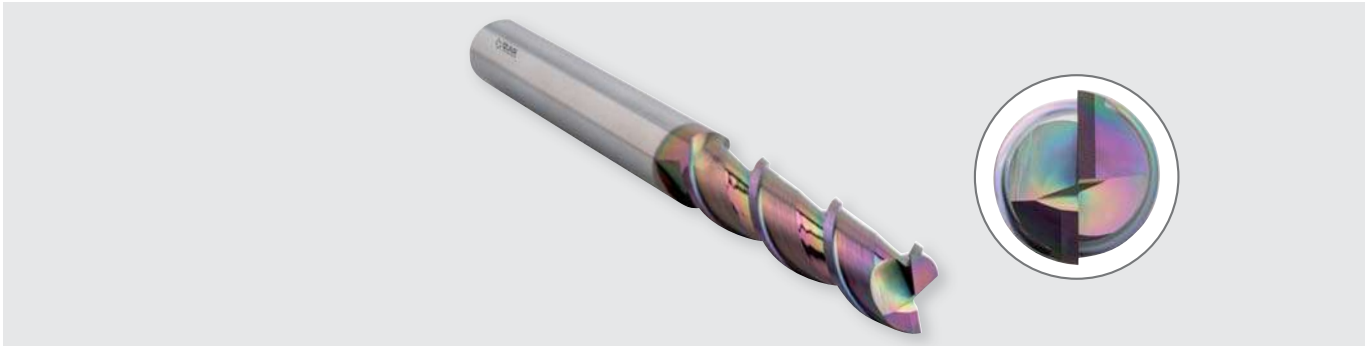
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

New!

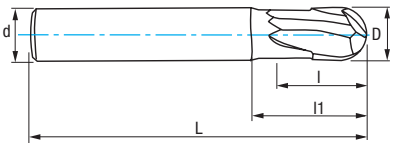
| D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | N° Art. IRIS | € |
|---|---|---|---|---|---|---|---|---|
| **5,00** | 5,00 | 75 | 20 | 2 | 66001 | **27,08** | 59833 | **33,85** |
| **6,00** | 6,00 | 100 | 25 | 2 | 81094 | **30,09** | 59836 | **37,61** |
| **8,00** | 8,00 | 100 | 25 | 2 | 81095 | **45,13** | 59841 | **56,42** |
| **10,00** | 10,00 | 100 | 40 | 2 | 81096 | **59,31** | 59842 | **74,14** |
| **12,00** | 12,00 | 100 | 50 | 2 | 81097 | **81,24** | 59862 | **101,55** |
| **16,00** | 16,00 | 100 | 50 | 2 | 81099 | **124,65** | 59863 | **155,82** |

**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

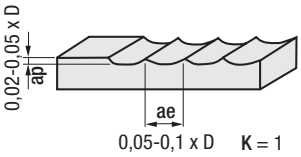


# Ref. 9465

## FRESA METAL DURO 2Z RADIAL 48-70 HRC
48-70 HRC Ball Nose 2Z Carbide End Mill
Fraise carbure 2Z hémisphérique 48-70 HRC




| **MD**/HM Carbure Grano UF | SUA | IZAR Std. | | 2 Z | | 15° | DIN 6535 HA | R Tol. D<12 ±0,010 D>12 ±0,015 |
|---|---|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | SUA | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 |
| P | P.4 | 60-90 | 0,013 | 0,025 | 0,037 | 0,047 | 0,057 | 0,065 | 0,075 |
| H | 45-55 HRC | 85-130 | 0,010 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 |
| | 55-60 HRC | 75-120 | 0,010 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 |
| | 60-70 HRC | 45-65 | 0,005 | 0,015 | 0,025 | 0,025 | 0,030 | 0,040 | 0,050 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

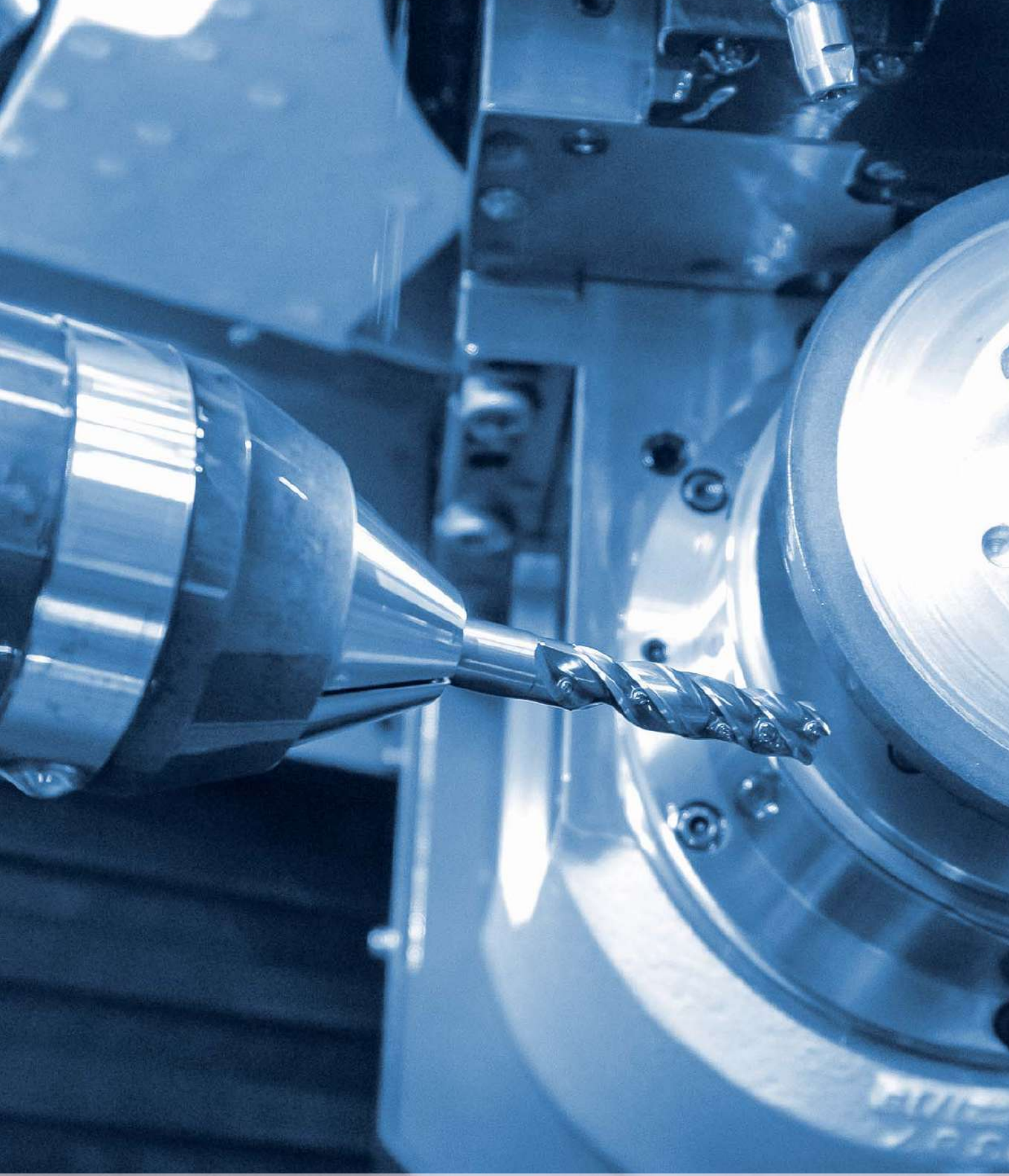
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | R mm | d mm | L mm | l1 mm | l mm | Z | N° Art. SUA | € |
|---|---|---|---|---|---|---|---|---|
| **2,00** | 1,00 | 6,00 | 50 | 4 | 2 | 2 | 53684 | **44,50** |
| **3,00** | 1,50 | 6,00 | 50 | 6 | 3 | 2 | 53690 | **44,50** |
| **4,00** | 2,00 | 6,00 | 50 | 8 | 4 | 2 | 53696 | **44,50** |
| **5,00** | 2,50 | 6,00 | 50 | 10 | 5 | 2 | 53704 | **44,50** |
| **6,00** | 3,00 | 6,00 | 50 | 12 | 6 | 2 | 53708 | **44,50** |
| **8,00** | 4,00 | 8,00 | 60 | 16 | 8 | 2 | 53714 | **58,66** |
| **10,00** | 5,00 | 10,00 | 75 | 20 | 10 | 2 | 53720 | **90,26** |
| **12,00** | 6,00 | 12,00 | 75 | 24 | 12 | 2 | 53726 | **118,69** |
| **16,00** | 8,00 | 16,00 | 100 | 32 | 16 | 2 | 53729 | **268,06** |

**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

- **Adecuada para materiales templados a 50 HRC y hasta un máximo de 70 HRC.**
- **Geometría robusta con gran rigidez que proporciona un excelente acabado superficial.**
- **Ángulos de hélice y de corte especiales para materiales templados.**
- **Designed for 50 HRC hardened materials and even up to 70 HRC hardness.**
- **Robust geometry which provides an excellent surface finish.**
- **Helix and cutting angles specifically designed for hardened materials.**
- Conçu pour les matériaux supérieurs 50 HRC et même jusqu'à 70 HRC de dureté.
- Géométrie robuste qui offre une excellente finition de surface.
- Angles d'hélice et de coupe spécialement conçus pour les matériaux supérieurs.

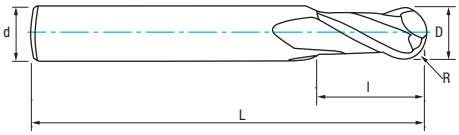


# Tecnología e innovación

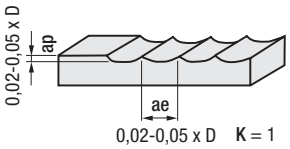
izartool.com

# Ref. 9425

## FRESA METAL DURO 2Z CABEZA ESFÉRICA < 55 HRC
< 55 HRC Ball Nose 2Z Carbide End Mill
Fraise carbure 2Z hémisphérique < 55 HRC




**MD**/HM/Carbure Micrograno | CROMAX | DIN 6528 N | 2 Z | 30° | DIN 6535 HA | Tol. D (e8) d (h6)




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | CROMAX | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.1 | 100-130 | 125-160 | 0,010 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,150 |
| | P.2 | 90-120 | 112-150 | 0,010 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | P.3 | 50-100 | 60-130 | 0,010 | 0,020 | 0,025 | 0,035 | 0,040 | 0,050 | 0,060 | 0,075 |
| | P.5 | 80-100 | 100-130 | 0,006 | 0,010 | 0,025 | 0,025 | 0,025 | 0,040 | 0,080 | 0,100 |
| M | | 40-60 | 50-80 | 0,006 | 0,010 | 0,025 | 0,035 | 0,035 | 0,050 | 0,070 | 0,080 |
| K | K.1 | 55-70 | 68-95 | 0,010 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | K.2 | 30-50 | 40-60 | 0,010 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| S | | 40-55 | 50-68 | 0,006 | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 |
| N | N.1 | 100-250 | 140-350 | 0,010 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.2 | 100-250 | 140-350 | 0,010 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.3 | 100-300 | 140-420 | 0,006 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.4 | 100-300 | 140-420 | 0,006 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.5 | 90-200 | 100-300 | 0,006 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.6 | 100-200 | 140-280 | 0,010 | 0,020 | 0,030 | 0,030 | 0,040 | 0,050 | 0,100 | 0,150 |
| | N.7 | 50-125 | 70-175 | 0,008 | 0,015 | 0,025 | 0,025 | 0,030 | 0,040 | 0,080 | 0,100 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

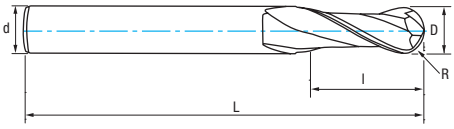
**New!**

| D mm | R mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | N° Art. CROMAX | € |
|---|---|---|---|---|---|---|---|---|---|
| **2,00** | 1,00 | 3,00 | 38 | 5 | 2 | 21761 | **14,76** | 21762 | **20,31** |
| **2,50** | 1,25 | 3,00 | 38 | 6 | 2 | 21760 | **14,76** | 21666 | **20,31** |
| **3,00** | 1,50 | 3,00 | 38 | 12 | 2 | 28422 | **14,76** | 28695 | **20,31** |
| **4,00** | 2,00 | 4,00 | 50 | 12 | 2 | 28423 | **16,90** | 28696 | **22,43** |
| **5,00** | 2,50 | 5,00 | 50 | 16 | 2 | 28424 | **17,39** | 28697 | **22,91** |
| **6,00** | 3,00 | 6,00 | 57 | 16 | 2 | 28425 | **19,35** | 28698 | **24,88** |
| **8,00** | 4,00 | 8,00 | 63 | 20 | 2 | 28426 | **27,35** | 28699 | **33,72** |
| **10,00** | 5,00 | 10,00 | 72 | 22 | 2 | 28427 | **37,62** | 28700 | **44,62** |
| **12,00** | 6,00 | 12,00 | 83 | 22 | 2 | 28428 | **56,12** | 28701 | **63,72** |
| **14,00** | 7,00 | 14,00 | 83 | 25 | 2 | 28429 | **76,74** | 28702 | **85,27** |
| **16,00** | 8,00 | 16,00 | 92 | 25 | 2 | 28430 | **96,83** | 28703 | **106,84** |
| **20,00** | 10,00 | 20,00 | 104 | 32 | 2 | 28431 | **153,03** | 28704 | **165,36** |

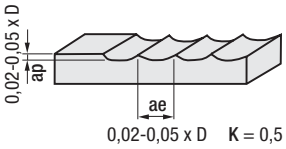
**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

# Ref. 9426

## FRESA METAL DURO SERIE LARGA 2Z CABEZA ESFÉRICA < 55 HRC
< 55 HRC Ball Nose 2Z Long Series Carbide End Mill
Fraise carbure série longue 2Z hémisphérique < 55 HRC




| MD/HM/Carbure Micrograno | CROMAX | IZAR Std. N | | 2 Z | | 30° | DIN 6535 HA | Tol. D (e8) d (h6) | Serie Larga Long Series Série Longue |
|---|---|---|---|---|---|---|---|---|---|




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | CROMAX | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.1 | 100-130 | 125-160 | 0,010 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,150 |
| | P.2 | 90-120 | 112-150 | 0,010 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | P.3 | 50-100 | 60-130 | 0,010 | 0,020 | 0,025 | 0,035 | 0,040 | 0,050 | 0,060 | 0,075 |
| | P.5 | 80-100 | 100-130 | 0,006 | 0,010 | 0,025 | 0,025 | 0,025 | 0,040 | 0,080 | 0,100 |
| M | | 40-60 | 50-80 | 0,006 | 0,010 | 0,025 | 0,035 | 0,035 | 0,050 | 0,070 | 0,080 |
| K | K.1 | 55-70 | 68-95 | 0,010 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| | K.2 | 30-50 | 40-60 | 0,010 | 0,020 | 0,030 | 0,040 | 0,055 | 0,065 | 0,080 | 0,100 |
| S | | 40-55 | 50-68 | 0,006 | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 |
| N | N.1 | 100-250 | 140-350 | 0,010 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.2 | 100-250 | 140-350 | 0,010 | 0,020 | 0,050 | 0,050 | 0,060 | 0,075 | 0,080 | 0,125 |
| | N.3 | 100-300 | 140-420 | 0,006 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.4 | 100-300 | 140-420 | 0,006 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.5 | 90-200 | 100-300 | 0,006 | 0,010 | 0,050 | 0,080 | 0,080 | 0,100 | 0,150 | 0,200 |
| | N.6 | 100-200 | 140-280 | 0,010 | 0,020 | 0,030 | 0,030 | 0,040 | 0,050 | 0,100 | 0,150 |
| | N.7 | 50-125 | 70-175 | 0,008 | 0,015 | 0,025 | 0,025 | 0,030 | 0,040 | 0,080 | 0,100 |

New!

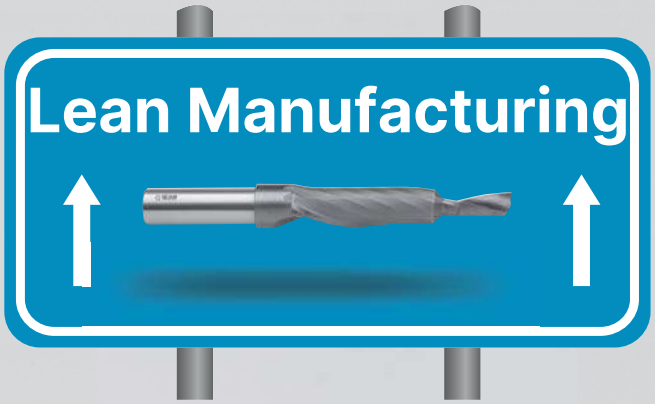
| D mm | R mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | N° Art. CROMAX | € |
|---|---|---|---|---|---|---|---|---|---|
| **2,00** | 1,00 | 3,00 | 75 | 8,00 | 2 | 21771 | **26,52** | 21769 | **32,05** |
| **2,50** | 1,25 | 3,00 | 75 | 10,00 | 2 | 21772 | **26,52** | 21770 | **32,05** |
| **3,00** | 1,50 | 3,00 | 75 | 12,00 | 2 | 28506 | **26,52** | 13389 | **32,05** |
| **4,00** | 2,00 | 4,00 | 75 | 12,00 | 2 | 28507 | **28,01** | 13392 | **33,54** |
| **5,00** | 2,50 | 5,00 | 75 | 16,00 | 2 | 28508 | **36,07** | 13395 | **41,62** |
| **6,00** | 3,00 | 6,00 | 100 | 20,00 | 2 | 28509 | **38,85** | 13398 | **44,96** |
| **8,00** | 4,00 | 8,00 | 100 | 25,00 | 2 | 28510 | **59,03** | 13130 | **66,03** |
| **10,00** | 5,00 | 10,00 | 100 | 25,00 | 2 | 28512 | **84,70** | 13401 | **92,40** |
| **12,00** | 6,00 | 12,00 | 100 | 30,00 | 2 | 28513 | **129,58** | 13404 | **137,95** |
| **12,00** | 6,00 | 12,00 | 150 | 30,00 | 2 | 41089 | **143,37** | 30429 | **151,73** |
| **14,00** | 7,00 | 14,00 | 100 | 30,00 | 2 | 28514 | **168,41** | 13407 | **176,77** |
| **14,00** | 7,00 | 14,00 | 150 | 30,00 | 2 | 41091 | **186,09** | 30431 | **194,45** |
| **16,00** | 8,00 | 16,00 | 100 | 40,00 | 2 | 28515 | **224,06** | 13410 | **233,30** |
| **16,00** | 8,00 | 16,00 | 150 | 40,00 | 2 | 41092 | **246,65** | 30432 | **256,62** |
| **20,00** | 10,00 | 20,00 | 125 | 40,00 | 2 | 41094 | **349,67** | 30433 | **361,05** |
| **20,00** | 10,00 | 20,00 | 150 | 40,00 | 2 | 41095 | **384,79** | 30434 | **397,16** |

**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

# ESPECIALISTAS EN HERRAMIENTAS BAJO DEMANDA

Specialists in custom made tools

Spécialistes en outils sur demande




**DISEÑAMOS Y FABRICAMOS A MEDIDA CUALQUIERA QUE SEAN SUS NECESIDADES**

**Los procesos de fabricación "Next Generation" proporcionan un mejor servicio y control de calidad**

**La implementación del sistema "Lean Manufacturing" en nuestro entorno productivo se centra en la fabricación pieza a pieza ("one-piece-flow"), lo que da como resultado una flexibilidad excepcional y reduce drásticamente el tamaño del lote y el plazo de entrega, garantizando un plazo de 2-3 semanas para la herramienta especial.**

WE DESIGN SPECIAL TOOLS BASED ON YOUR REQUIREMENTS

Next generation manufacturing processes provide an improved service and quality control.

Lean Manufacturing implementation in our production environment focuses on the one-piece-flow, resulting in outstanding flexibility and reducing the batch size and lead time dramatically. Therefore we guarantee a lead time of 2-3 weeks in custom made products.

NOUS CONCEVONS ET FABRIQUONS N'IMPORTE QUELS SONT VOS BESOINS

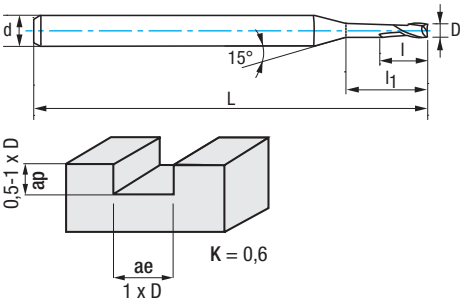
Les processus de fabrication de «nouvelle génération» offrent un meilleur service et contrôle de la qualité.

La mise en œuvre du système «Lean Manufacturing» dans notre environnement de production se concentre sur la fabrication pièce par pièce (flux en une seule pièce), ce qui se traduit par une flexibilité exceptionnelle et réduit considérablement la taille des lots et les délais. C'est pourquoi nous garantissons un délai de 2 à 3 semaines pour les produits sur demande.

# Ref. 9470

## MICRO FRESA METAL DURO 2Z PLANA ALTO RENDIMIENTO
## High Performance Square 2Z Carbide Micro End Mill
## Micro Fraise carbure 2Z haut rendement

| MD HM/Carbure Grano UF | SUA | IZAR std. | | 2 Z | * | 30° | DIN 6535 HA | Tol. 0/- 0.005 | 65 HRC |
|---|---|---|---|---|---|---|---|---|---|




* **Con radio bajo demanda**
**With radius upon request**
Avec rayon sur demande

Video

- **Geometría con cuello apto para mecanizados profundos.**
- **Diseño reforzado que reduce las vibraciones y el riesgo de roturas.**
- **Long-neck geometry suitable for deep milling.**
- **Reinforced design for avoiding vibrations and causing less damage to the end mill.**
- Géométrie avec cou apte pour usinages profonds.
- Design renforcé qui réduise les vibrations et le risque de ruptures.

| | D mm | d mm | L mm | l mm | l1 mm | Z | N° Art. SUA | € |
|---|---|---|---|---|---|---|---|---|
| | **0,20** | 4,00 | 50 | 0,30 | **2,00** | 2 | 78397 | **44,37** |
| | **0,30** | 4,00 | 50 | 0,40 | **1,00** | 2 | 78400 | **37,35** |
| | **0,30** | 4,00 | 50 | 0,40 | **3,00** | 2 | 78401 | **37,35** |
| | **0,40** | 4,00 | 50 | 0,50 | **2,00** | 2 | 78402 | **37,35** |
| | **0,40** | 4,00 | 50 | 0,50 | **4,00** | 2 | 78403 | **40,22** |
| | **0,50** | 4,00 | 50 | 0,60 | **2,00** | 2 | 78405 | **36,57** |
| | **0,50** | 4,00 | 50 | 0,60 | **4,00** | 2 | 78406 | **36,57** |
| | **0,60** | 4,00 | 50 | 0,70 | **2,00** | 2 | 78407 | **34,61** |
| | **0,60** | 4,00 | 50 | 0,70 | **6,00** | 2 | 78408 | **34,61** |
| | **0,80** | 4,00 | 50 | 1,00 | **4,00** | 2 | 78409 | **34,61** |
| | **0,80** | 4,00 | 50 | 1,00 | **6,00** | 2 | 78410 | **34,61** |
| | **0,80** | 4,00 | 50 | 1,00 | **8,00** | 2 | 78411 | **34,61** |
| | **1,00** | 4,00 | 50 | 1,20 | **4,00** | 2 | 78412 | **23,15** |
| | **1,00** | 4,00 | 50 | 1,20 | **6,00** | 2 | 78413 | **23,15** |
| New! | **1,00** | 4,00 | 50 | 1,20 | **10,00** | 2 | 12934 | **23,15** |
| | **1,00** | 4,00 | 50 | 1,20 | **12,00** | 2 | 78414 | **23,15** |
| | **1,20** | 4,00 | 50 | 1,50 | **6,00** | 2 | 78415 | **24,49** |
| New! | **1,20** | 4,00 | 50 | 1,50 | **10,00** | 2 | 12937 | **24,49** |
| | **1,20** | 4,00 | 50 | 1,50 | **12,00** | 2 | 78416 | **24,49** |
| | **1,50** | 4,00 | 50 | 1,80 | **6,00** | 2 | 78417 | **23,45** |
| New! | **1,50** | 4,00 | 50 | 1,80 | **10,00** | 2 | 12946 | **24,49** |
| | **1,50** | 4,00 | 50 | 1,80 | **12,00** | 2 | 78419 | **24,49** |
| | **1,50** | 4,00 | 50 | 1,80 | **18,00** | 2 | 79122 | **24,49** |
| | **1,80** | 4,00 | 50 | 2,00 | **10,00** | 2 | 78420 | **24,49** |
| | **2,00** | 4,00 | 50 | 2,50 | **6,00** | 2 | 78421 | **27,42** |
| | **2,00** | 4,00 | 50 | 2,50 | **10,00** | 2 | 78423 | **27,42** |
| New! | **2,00** | 4,00 | 50 | 2,50 | **16,00** | 2 | 12949 | **27,42** |
| | **2,00** | 4,00 | 50 | 2,50 | **20,00** | 2 | 78424 | **27,42** |
| | **3,00** | 6,00 | 50 | 3,50 | **16,00** | 2 | 78425 | **32,31** |
| | **4,00** | 6,00 | 60 | 4,50 | **20,00** | 2 | 78426 | **36,00** |

**Materiales y condiciones de corte**
**Materials and Cutting conditions** / Matériaux et conditions de coupe

| Material | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | D (mm) | 0,20 | 0,30 | 0,30 | 0,40 | 0,40 | 0,50 | 0,50 | 0,60 | 0,60 | 0,80 | 0,80 | 0,80 | 1,00 | 1,00 | 1,00 | 1,20 | 1,20 | 1,50 | 1,50 | 1,50 | 1,80 | 2,0 | 2,0 | 2,0 | 3,0 | 4,0 |
| Grupo | Sub. | l1 (mm) | 2,00 | 1,00 | 3,00 | 2,00 | 4,00 | 2,00 | 4,00 | 2,00 | 6,00 | 4,00 | 6,00 | 8,00 | 4,00 | 6,00 | 12,00 | 6,00 | 12,00 | 6,00 | 12,00 | 18,00 | 10,00 | 6,00 | 10,00 | 20,00 | 16,00 | 20,00 |
| P | P.3 | Vf (mm/min) | 320 | 420 | 330 | 590 | 350 | 470 | 370 | 560 | 330 | 590 | 475 | 360 | 540 | 445 | 350 | 590 | 350 | 830 | 630 | 430 | 580 | 570 | 455 | 340 | 720 | 530 |
| | | RPM | 50000 | 50000 | 43000 | 50000 | 31400 | 33000 | 25650 | 35200 | 20900 | 26400 | 21275 | 16150 | 18700 | 15500 | 12300 | 17600 | 10450 | 17600 | 13350 | 9100 | 11900 | 10550 | 8450 | 6350 | 5670 | 4250 |
| | | ap (mm) | 0,010 | 0,015 | 0,006 | 0,028 | 0,005 | 0,035 | 0,006 | 0,030 | 0,007 | 0,040 | 0,024 | 0,009 | 0,028 | 0,020 | 0,011 | 0,070 | 0,025 | 0,077 | 0,047 | 0,017 | 0,080 | 0,140 | 0,080 | 0,021 | 0,013 | 0,170 |
| P | P.5 | Vf (mm/min) | 280 | 310 | 265 | 340 | 295 | 315 | 285 | 290 | 260 | 310 | 295 | 280 | 280 | 265 | 250 | 280 | 250 | 280 | 265 | 250 | 410 | 300 | 285 | 270 | 480 | 350 |
| | | RPM | 50000 | 46200 | 39900 | 35200 | 30500 | 26000 | 23750 | 22000 | 19900 | 16700 | 15950 | 15200 | 11500 | 11000 | 10500 | 10000 | 9100 | 8000 | 7500 | 7000 | 7000 | 6700 | 6400 | 6100 | 4300 | 3200 |
| | | ap (mm) | 0,009 | 0,011 | 0,004 | 0,020 | 0,003 | 0,025 | 0,004 | 0,021 | 0,005 | 0,028 | 0,017 | 0,006 | 0,020 | 0,014 | 0,008 | 0,042 | 0,015 | 0,055 | 0,035 | 0,012 | 0,055 | 0,100 | 0,055 | 0,015 | 0,095 | 0,125 |
| S | | Vf (mm/min) | 256 | 336 | 264 | 472 | 280 | 376 | 296 | 448 | 264 | 472 | 380 | 288 | 432 | 356 | 280 | 472 | 280 | 664 | 504 | 344 | 464 | 456 | 364 | 272 | 576 | 424 |
| | | RPM | 40000 | 40000 | 34400 | 40000 | 25120 | 26400 | 20520 | 28160 | 16720 | 21120 | 17020 | 12920 | 14960 | 12400 | 9840 | 14080 | 8360 | 14080 | 10680 | 7280 | 9520 | 8440 | 6760 | 5080 | 4536 | 3400 |
| | | ap (mm) | 0,009 | 0,011 | 0,004 | 0,020 | 0,003 | 0,025 | 0,004 | 0,021 | 0,005 | 0,028 | 0,017 | 0,006 | 0,020 | 0,014 | 0,008 | 0,042 | 0,015 | 0,055 | 0,035 | 0,012 | 0,055 | 0,100 | 0,055 | 0,015 | 0,095 | 0,125 |
| H | MATS. TEMPLADOS Hardened Steel Trempés | Vf (mm/min) | 240 | 185 | 105 | 200 | 120 | 130 | 115 | 120 | 100 | 125 | 117 | 110 | 115 | 112 | 110 | 115 | 100 | 115 | 112 | 110 | 110 | 120 | 110 | 100 | 200 | 150 |
| | | RPM | 50000 | 32300 | 23900 | 24600 | 18300 | 18000 | 14200 | 15500 | 11900 | 11700 | 16200 | 9000 | 8050 | 7175 | 6300 | 7000 | 5400 | 5500 | 4900 | 4300 | 4500 | 4700 | 4150 | 3600 | 2800 | 2100 |
| | | ap (mm) | 0,008 | 0,007 | 0,003 | 0,012 | 0,002 | 0,015 | 0,003 | 0,013 | 0,003 | 0,017 | 0,010 | 0,004 | 0,012 | 0,008 | 0,005 | 0,026 | 0,009 | 0,033 | 0,020 | 0,007 | 0,035 | 0,060 | 0,035 | 0,009 | 0,055 | 0,075 |

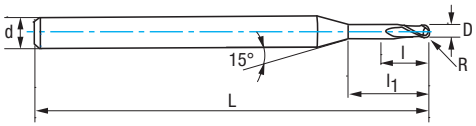
**Si no es posible alcanzar las RPM indicadas debemos de reducir el avance proporcionalmente.**
If it is not possible to get the above suggested RPM conditions please reduce the feed accordingly.
Si ce n'est pas possible d'arriver aux RPM indiqués son doit réduire l'avance proportionnellement.

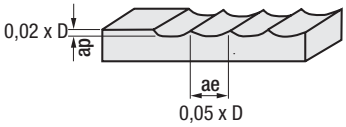
- **Valores ap típicos de ranurado. Para contorneado x 1,5**
- ap values for grooving. For contouring use the above values x 1,5
- Valeurs ap pour le rainurage. Pour le contourage, utilisez les valeurs ci-dessus x 1,5

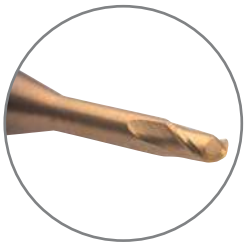
# Ref. 9475

## MICRO FRESA METAL DURO 2Z CABEZA ESFÉRICA ALTO RENDIMIENTO
## High Performance Ball Nose 2Z Carbide Micro End Mill
## Micro Fraise carbure 2Z haut rendement

| MD HM/Carbure Grano UF | SUA | IZAR std. | | 2 Z | | 30° | DIN 6535 HA | R Tol. ±0,01 | 65 HRC |
|---|---|---|---|---|---|---|---|---|---|



- **Geometría con cuello apto para mecanizados profundos.**
- **Diseño reforzado que reduce las vibraciones y el riesgo de roturas.**

- **Long-neck geometry suitable for deep milling.**
- **Reinforced design for avoiding vibrations and causing less damage to the end mill.**

- Géométrie avec cou apte pour usinages profonds.
- Design renforcé qui réduise les vibrations et le risque de ruptures.

| | D mm | R mm | d mm | L mm | l mm | l1 mm | Z | N° Art. SUA | € |
|---|---|---|---|---|---|---|---|---|---|
| | **0,30** | 0,15 | 4,00 | 50 | 0,30 | **1,00** | 2 | 78427 | **56,31** |
| | **0,30** | 0,15 | 4,00 | 50 | 0,30 | **3,00** | 2 | 78428 | **56,31** |
| | **0,40** | 0,20 | 4,00 | 50 | 0,40 | **2,00** | 2 | 78429 | **49,44** |
| | **0,40** | 0,20 | 4,00 | 50 | 0,40 | **4,00** | 2 | 78430 | **51,26** |
| | **0,50** | 0,25 | 4,00 | 50 | 0,50 | **2,00** | 2 | 78431 | **45,78** |
| | **0,50** | 0,25 | 4,00 | 50 | 0,50 | **4,00** | 2 | 78432 | **45,78** |
| | **0,60** | 0,30 | 4,00 | 50 | 0,60 | **2,00** | 2 | 78433 | **44,24** |
| | **0,60** | 0,30 | 4,00 | 50 | 0,60 | **4,00** | 2 | 78434 | **44,24** |
| | **0,60** | 0,30 | 4,00 | 50 | 0,60 | **6,00** | 2 | 78435 | **44,24** |
| | **0,80** | 0,40 | 4,00 | 50 | 0,80 | **4,00** | 2 | 78436 | **44,24** |
| | **0,80** | 0,40 | 4,00 | 50 | 0,80 | **6,00** | 2 | 78437 | **44,24** |
| | **0,80** | 0,40 | 4,00 | 50 | 0,80 | **8,00** | 2 | 78438 | **44,24** |
| | **1,00** | 0,50 | 4,00 | 50 | 1,00 | **4,00** | 2 | 78439 | **36,83** |
| | **1,00** | 0,50 | 4,00 | 50 | 1,00 | **6,00** | 2 | 78440 | **36,83** |
| New! | **1,00** | 0,50 | 4,00 | 50 | 1,20 | **10,00** | 2 | 12971 | **38,54** |
| | **1,00** | 0,50 | 4,00 | 50 | 1,00 | **12,00** | 2 | 78441 | **38,54** |
| | **1,20** | 0,60 | 4,00 | 50 | 1,20 | **6,00** | 2 | 78442 | **38,54** |
| New! | **1,20** | 0,60 | 4,00 | 50 | 1,50 | **10,00** | 2 | 12995 | **38,54** |
| | **1,20** | 0,60 | 4,00 | 50 | 1,20 | **12,00** | 2 | 78443 | **38,54** |
| | **1,50** | 0,75 | 4,00 | 50 | 1,50 | **6,00** | 2 | 78444 | **38,54** |
| New! | **1,50** | 0,75 | 4,00 | 50 | 1,80 | **10,00** | 2 | 13033 | **38,54** |
| | **1,50** | 0,75 | 4,00 | 50 | 1,50 | **12,00** | 2 | 78445 | **38,54** |
| | **2,00** | 1,00 | 4,00 | 50 | 2,00 | **6,00** | 2 | 78446 | **34,94** |
| | **2,00** | 1,00 | 4,00 | 50 | 2,00 | **10,00** | 2 | 78447 | **34,94** |
| New! | **2,00** | 1,00 | 4,00 | 50 | 2,50 | **16,00** | 2 | 13036 | **34,94** |
| | **2,00** | 1,00 | 4,00 | 50 | 2,00 | **20,00** | 2 | 78448 | **34,94** |
| | **3,00** | 1,50 | 6,00 | 60 | 3,00 | **16,00** | 2 | 78449 | **44,00** |
| | **4,00** | 2,00 | 6,00 | 60 | 4,00 | **20,00** | 2 | 78450 | **44,00** |

**Materiales y condiciones de corte**
**Materials and Cutting Conditions** / Matériaux et conditions de coupe

**Avances fz*/rev. (mm/min.) Feed /** Pas

| Material Grupo | Sub. | D (mm) | 0,30 | 0,30 | 0,40 | 0,40 | 0,50 | 0,50 | 0,60 | 0,60 | 0,60 | 0,80 | 0,80 | 0,80 | 1,00 | 1,00 | 1,00 | 1,20 | 1,20 | 1,50 | 1,50 | 2,0 | 2,0 | 2,0 | 3,0 | 4,0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | l1 (mm) | 1,00 | 3,00 | 2,00 | 4,00 | 2,00 | 4,00 | 2,00 | 4,00 | 6,00 | 4,00 | 6,00 | 8,00 | 4,00 | 6,00 | 12,00 | 6,00 | 12,00 | 6,00 | 12,00 | 6,00 | 10,00 | 20,00 | 16,00 | 20,00 |
| P | P.3 | Vf (mm/min) | 520 | 480 | 790 | 720 | 870 | 600 | 850 | 720 | 590 | 890 | 760 | 640 | 850 | 720 | 600 | 780 | 590 | 760 | 580 | 800 | 690 | 590 | 860 | 830 |
| | | RPM | 50000 | 48000 | 50000 | 48000 | 49500 | 34100 | 40700 | 34600 | 28600 | 30800 | 26400 | 22000 | 24200 | 21000 | 17800 | 18700 | 14300 | 14300 | 11000 | 11000 | 9700 | 8500 | 6900 | 5200 |
| | | ap (mm) | 0,017 | 0,010 | 0,032 | 0,013 | 0,028 | 0,007 | 0,034 | 0,020 | 0,007 | 0,064 | 0,040 | 0,016 | 0,080 | 0,045 | 0,008 | 0,032 | 0,024 | 0,048 | 0,031 | 0,160 | 0,090 | 0,024 | 0,150 | 0,200 |
| P | P.5 | Vf (mm/min) | 460 | 440 | 550 | 450 | 540 | 490 | 540 | 510 | 480 | 550 | 520 | 490 | 540 | 500 | 470 | 540 | 480 | 540 | 480 | 530 | 500 | 470 | 620 | 580 |
| | | RPM | 50000 | 48000 | 50000 | 48000 | 35200 | 31900 | 29700 | 28000 | 26400 | 22000 | 20900 | 19800 | 17600 | 16500 | 15400 | 14000 | 12000 | 11500 | 10000 | 8800 | 8300 | 7900 | 5500 | 4100 |
| | | ap (mm) | 0,014 | 0,008 | 0,026 | 0,011 | 0,023 | 0,005 | 0,028 | 0,017 | 0,006 | 0,052 | 0,032 | 0,013 | 0,065 | 0,036 | 0,007 | 0,026 | 0,020 | 0,039 | 0,025 | 0,130 | 0,075 | 0,020 | 0,120 | 0,045 |
| S | | Vf (mm/min) | 416 | 384 | 632 | 576 | 696 | 480 | 680 | 576 | 472 | 712 | 608 | 512 | 680 | 576 | 480 | 624 | 472 | 608 | 464 | 640 | 552 | 472 | 688 | 664 |
| | | RPM | 40000 | 38400 | 40000 | 38400 | 39600 | 27280 | 32560 | 27680 | 22880 | 24640 | 21120 | 17600 | 19360 | 16800 | 14240 | 14960 | 11440 | 11440 | 8800 | 8800 | 7760 | 6800 | 5520 | 4160 |
| | | ap (mm) | 0,014 | 0,008 | 0,026 | 0,011 | 0,023 | 0,005 | 0,028 | 0,017 | 0,006 | 0,052 | 0,032 | 0,013 | 0,065 | 0,036 | 0,007 | 0,026 | 0,020 | 0,039 | 0,025 | 0,130 | 0,075 | 0,020 | 0,120 | 0,045 |
| H MATS. TEMPLADOS Hardened Steel Trempés | | Vf (mm/min) | 420 | 390 | 460 | 400 | 480 | 440 | 480 | 440 | 400 | 500 | 470 | 440 | 500 | 470 | 440 | 480 | 420 | 480 | 420 | 480 | 460 | 440 | 580 | 550 |
| | | RPM | 45652 | 42545 | 41818 | 42667 | 31289 | 28645 | 26400 | 24157 | 22000 | 20000 | 18890 | 17780 | 16296 | 15510 | 14417 | 12444 | 10500 | 10222 | 8750 | 7970 | 7636 | 7396 | 5145 | 3888 |
| | | ap (mm) | 0,013 | 0,007 | 0,024 | 0,01 | 0,021 | 0,005 | 0,025 | 0,015 | 0,006 | 0,048 | 0,030 | 0,012 | 0,060 | 0,030 | 0,006 | 0,024 | 0,018 | 0,036 | 0,023 | 0,120 | 0,07 | 0,018 | 0,080 | 0,150 |

**Si no es posible alcanzar las RPM indicadas debemos de reducir el avance proporcionalmente.**
**If it is not possible to get the above suggested RPM conditions please reduce the feed accordingly.**
Si ce n'est pas possible d'arriver aux RPM indiqués son doit réduire l'avance proportionnellement.

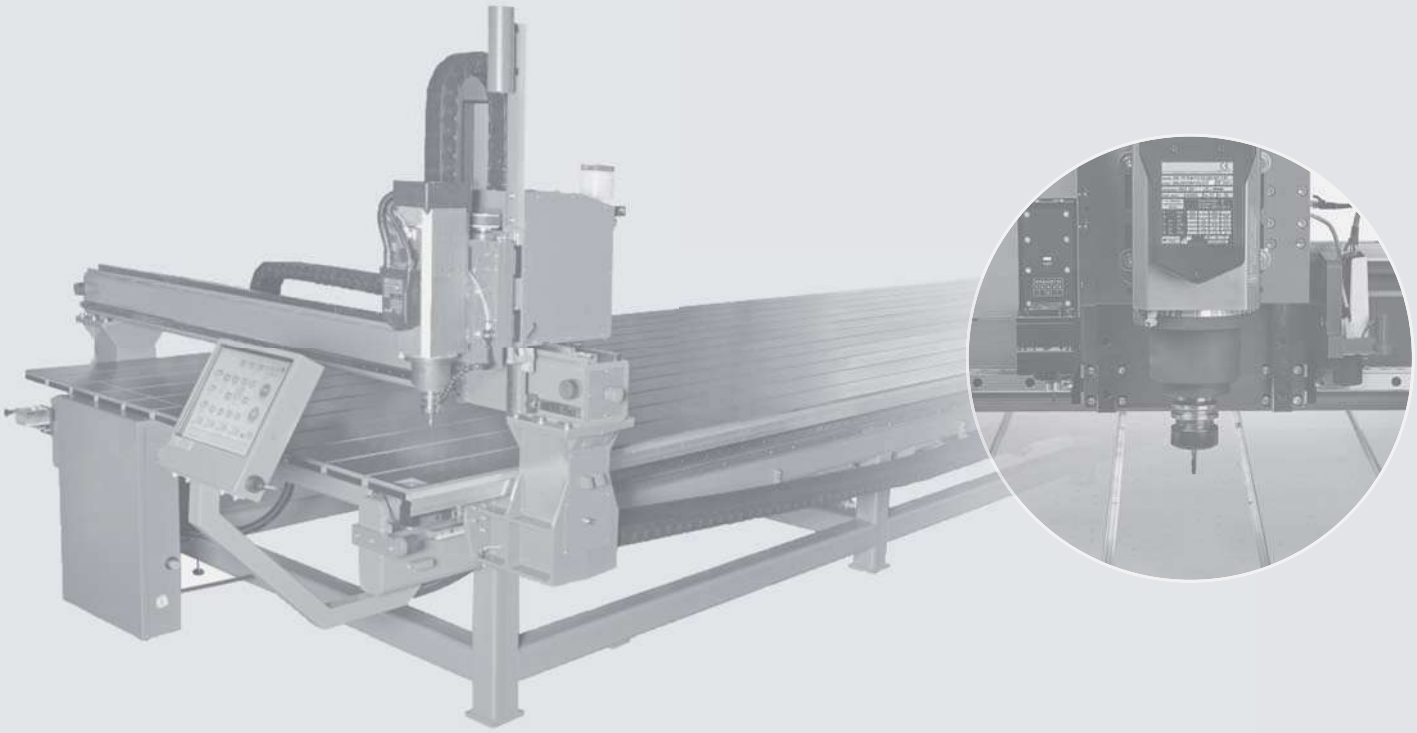
- **Valores ap típicos de ranurado. Para contorneado x 1,5**
- **ap values for grooving. For contouring use the above values x 1,5**
- Valeurs ap pour le rainurage. Pour le contourage, utilisez les valeurs ci-dessus x 1,5

# FRESADO 1Z ALUMINIO
## Aluminium Milling 1Z
## Fraisage 1Z aluminium

**Completa gama de fresas 1Z para mecanizado de alta velocidad de planchas o perfiles de aluminio y PVC**

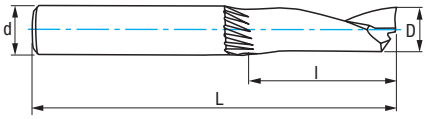
Wide Range of 1Z End Mills for High Speed Machining of Aluminium, PVC and others

Gamme complète de fraises 1Z pour l'usinage à grande vitesse de tôles ou profils aluminium et PVC



# Ref. 9441

## FRESA METAL DURO 1Z PULIDO ESPEJO ALUMINIO
Aluminium 1Z Mirror Polished Carbide End Mill
Fraise carbure 1Z polyglass aluminium




**MD**/HM Carbure Micrograno+ | IRIS | IZAR Std. | | 1 Z | 25° | DIN 6535 HA | | Al | **Pulido Espejo** Mirror Polished Polyglass

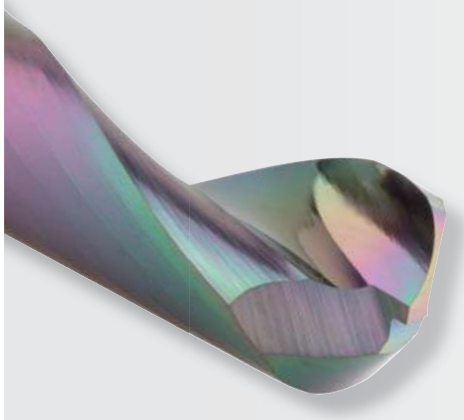
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

**K = 1**
**Coeficiente corrección**
**Correction coefficient**
Coéficient correction

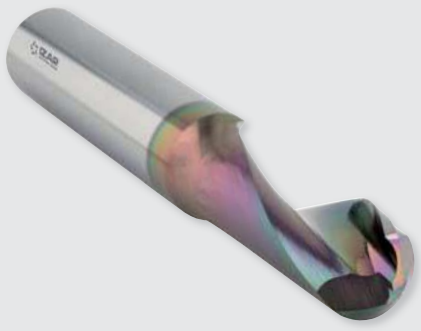
| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | |
|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 4 | Ø 6 | Ø 8 | Ø 10 |
| N | N.3 | 100-350 | 0,030 | 0,050 | 0,050 | 0,080 |
| | N.4 | 100-350 | 0,030 | 0,050 | 0,050 | 0,080 |
| | N.5 | 100-350 | 0,030 | 0,050 | 0,050 | 0,080 |
| | N.6 | 100-200 | 0,020 | 0,030 | 0,030 | 0,040 |
| | N.7 | 50-125 | 0,015 | 0,025 | 0,025 | 0,030 |

| D mm | d mm | L mm | l mm | N° Art. MD/HM | € | New! N° Art. IRIS | € |
|---|---|---|---|---|---|---|---|
| **3,00** | 3,00 | 38 | 12 | 82944 | **15,37** | 82933 | **19,21** |
| **4,00** | 4,00 | 40 | 15 | 82943 | **18,70** | 82934 | **23,38** |
| **5,00** | 5,00 | 50 | 16 | 82942 | **23,13** | 82935 | **28,92** |
| **6,00** | 6,00 | 50 | 18 | 82941 | **27,48** | 82936 | **34,35** |
| **8,00** | 8,00 | 63 | 22 | 82940 | **41,70** | 82937 | **52,13** |
| **10,00** | 10,00 | 72 | 30 | 82939 | **58,31** | 82938 | **72,88** |
| **12,00** | 12,00 | 83 | 35 | 10365 | **83,47** | 83926 | **104,34** |



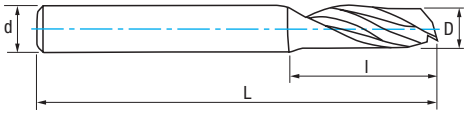
Ref. 9441 **Mat. Alum 7574 – Alum 2024**

| | Competitor A | Competitor B | IZAR Ref. 9441 |
|---|---|---|---|
| **Calidad Superficial** Surface Quality Qualité de surface | ★★★ | ★★★★ | ★★★★★ |
| **Consumo Máquina** Machine Effort Effort de la machine | ★★★ | ★★★★ | ★★★★★ |
| **Vida de Herramienta** Tool Life Vie de l'outil | ★★★ | ★★★ | ★★★★★ |



# Ref. 9416

## FRESA METAL DURO 1Z PULIDO ESPEJO ALUMINIO/TERMOPLÁSTICOS
Aluminium/Thermoplastics 1Z Mirror Polished Carbide End Mill
Fraise carbure 1Z polyglass Aluminium/Thermoplastiques




**MD**/HM Carbure Micrograno+ | IRIS | IZAR Std. | 1 Z | 30° | DIN 6535 HA | **PMMA** | **Pulido Espejo** Mirror Polished Polyglass

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = 1**
**Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 1 | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 14 | Ø 16 | Ø 20 |
| N | N.3 | 100-350 | 0,012 | 0,020 | 0,030 | 0,050 | 0,050 | 0,080 | 0,100 | 0,120 | 0,150 | 0,200 |
| | N.4 | 100-350 | 0,012 | 0,020 | 0,030 | 0,050 | 0,050 | 0,080 | 0,100 | 0,120 | 0,150 | 0,200 |
| | N.5 | 100-350 | 0,012 | 0,020 | 0,030 | 0,050 | 0,050 | 0,080 | 0,100 | 0,120 | 0,150 | 0,200 |
| | N.6 | 100-200 | 0,010 | 0,015 | 0,020 | 0,030 | 0,030 | 0,040 | 0,050 | 0,080 | 0,100 | 0,150 |
| | N.7 | 50-125 | 0,008 | 0,010 | 0,015 | 0,025 | 0,025 | 0,030 | 0,040 | 0,060 | 0,080 | 0,100 |

| | D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | New! N° Art. IRIS | € |
|---|---|---|---|---|---|---|---|---|---|
| | **1,00** | 3,00 | 38 | 5 | 1 | 59213 | **8,97** | 59865 | **11,22** |
| | **1,50** | 3,00 | 38 | 6 | 1 | 78324 | **8,97** | 59866 | **11,22** |
| | **2,00** | 3,00 | 38 | 6 | 1 | 78325 | **8,97** | 59884 | **11,22** |
| | **2,50** | 3,00 | 38 | 6 | 1 | 60852 | **8,97** | 59887 | **11,22** |
| | **3,00** | 3,00 | 38 | 12 | 1 | 78326 | **13,98** | 59934 | **17,47** |
| | **4,00** | 4,00 | 45 | 15 | 1 | 78327 | **17,01** | 59937 | **21,26** |
| | **5,00** | 5,00 | 50 | 16 | 1 | 78328 | **21,03** | 59938 | **26,30** |
| | **6,00** | 6,00 | 50 | 17 | 1 | 78329 | **24,98** | 59940 | **31,22** |
| | **8,00** | 8,00 | 60 | 22 | 1 | 78331 | **37,91** | 59943 | **47,39** |
| | **10,00** | 10,00 | 75 | 32 | 1 | 78332 | **53,00** | 59953 | **66,26** |
| | **12,00** | 12,00 | 75 | 35 | 1 | 78333 | **75,87** | 59956 | **94,84** |
| New! | **14,00** | 14,00 | 100 | 42 | 1 | 26737 | **167,08** | 59959 | **208,84** |
| New! | **16,00** | 16,00 | 100 | 52 | 1 | 26738 | **205,74** | 59961 | **257,18** |
| New! | **20,00** | 20,00 | 100 | 40 | 1 | 26603 | **270,18** | 59965 | **337,73** |

**5 Pcs**

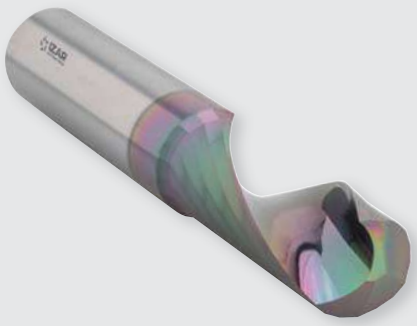
| Cont. | N° Art. MD/HM | € |
|---|---|---|
| **3-4-5 6-8 mm** | 78335 | Set Price! **109,16** |

- **Canal Especial con Pulido Espejo.**
- **Mejora de Rendimiento en Perfilería de Aluminio.**
- **Excelentes resultados en materiales termoplásticos como el metacrilato (PMMA), dejando acabados superficiales brillantes.**

- **Special Mirror-Polished Flute.**
- **Improved performance for aluminium profiles.**
- **Excellent results on thermoplastic materials such as methacrylate (PMMA), leaving shiny surface finishes.**

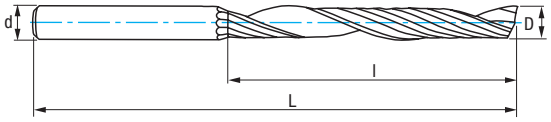
- Goujure spécial polyglass.
- Augmentation de la performance dans profils en aluminium.
- Excellents résultats sur les matériaux thermoplastiques tels que le méthacrylate (PMMA). Finition de surface brillantes.

Video



# Ref. 9417

## FRESA METAL DURO 1Z PULIDO ESPEJO SERIE LARGA ALUMINIO/TERMOPLÁSTICOS
Aluminium/Thermoplastics 1Z Mirror Long Series Polished Carbide End Mill
Fraise carbure série longue 1Z polyglass Aluminium/Thermoplastiques




**MD**/HM Carbure Micrograno+ | IRIS | IZAR Std. | 1 Z | 30° | DIN 6535 HA | **PMMA** | **Pulido Espejo** Mirror Polished Polyglass

**Serie Larga**
Long Series
Série Longue

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

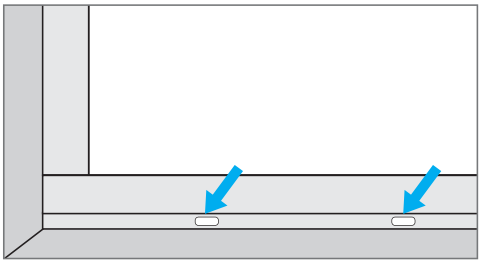
$$K = 1$$

**Coeficiente corrección**
**Correction coefficient**
Coéficient correction

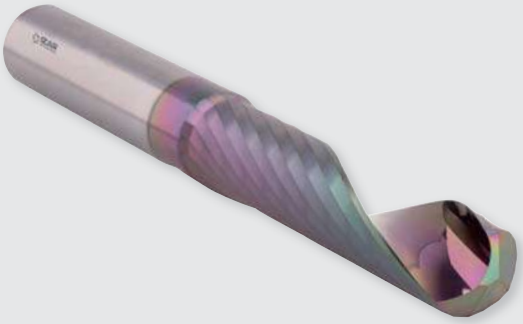
| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | |
|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 4 | Ø 6 | Ø 8 | Ø 10 |
| N | N.3 | 100-250 | 0,030 | 0,050 | 0,050 | 0,080 |
| | N.4 | 100-250 | 0,030 | 0,050 | 0,050 | 0,080 |
| | N.5 | 100-250 | 0,030 | 0,050 | 0,050 | 0,080 |
| | N.6 | 100-200 | 0,020 | 0,030 | 0,030 | 0,040 |
| | N.7 | 50-125 | 0,015 | 0,025 | 0,025 | 0,030 |

| | D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | New! N° Art. IRIS | € |
|---|---|---|---|---|---|---|---|---|---|
| New! | **3,00** | 3,00 | 70 | 12 | 1 | 21583 | **24,07** | 59971 | **30,09** |
| New! | **3,00** | 3,00 | 70 | 22 | 1 | 22080 | **25,41** | 59976 | **31,77** |
| | **3,00** | 3,00 | 70 | 42 | 1 | 76541 | **26,75** | 59967 | **33,43** |
| New! | **4,00** | 4,00 | 70 | 15 | 1 | 21584 | **29,80** | 59982 | **37,24** |
| New! | **4,00** | 4,00 | 70 | 22 | 1 | 22081 | **30,90** | 59983 | **38,63** |
| New! | **4,00** | 4,00 | 70 | 32 | 1 | 22085 | **32,01** | 59985 | **40,02** |
| | **4,00** | 4,00 | 70 | 42 | 1 | 78454 | **33,11** | 59979 | **41,40** |
| New! | **5,00** | 5,00 | 75 | 16 | 1 | 21585 | **35,71** | 59998 | **44,64** |
| | **5,00** | 5,00 | 75 | 42 | 1 | 78455 | **39,69** | 59988 | **49,60** |
| New! | **6,00** | 6,00 | 85 | 17 | 1 | 21586 | **46,74** | 60198 | **58,43** |
| | **6,00** | 6,00 | 85 | 52 | 1 | 78456 | **51,93** | 60004 | **64,92** |
| New! | **8,00** | 8,00 | 90 | 22 | 1 | 21587 | **67,86** | 61853 | **84,82** |
| | **8,00** | 8,00 | 90 | 52 | 1 | 78457 | **75,40** | 60255 | **94,25** |
| New! | **10,00** | 10,00 | 100 | 32 | 1 | 21589 | **93,35** | 60264 | **116,69** |
| | **10,00** | 10,00 | 100 | 52 | 1 | 78458 | **103,72** | 60261 | **129,66** |
| | **12,00** | 12,00 | 100 | 52 | 1 | 78459 | **136,60** | 60265 | **170,75** |
| | **14,00** | 14,00 | 100 | 55 | 1 | 83341 | **156,07** | 60270 | **195,08** |
| | **16,00** | 16,00 | 100 | 55 | 1 | 83342 | **186,25** | 60273 | **232,82** |

| | D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | New! N° Art. IRIS | € |
|---|---|---|---|---|---|---|---|---|---|
| | **5,00** | 5,00 | 80 | 40 | 1 | 83200 | **46,37** | 59992 | **57,97** |
| | **5,00** | 8,00 | 80 | 40 | 1 | 53735 | **74,19** | 59994 | **92,74** |
| New! | **5,00** | 8,00 | 110 | 40 | 1 | 19806 | **84,31** | 59997 | **105,38** |

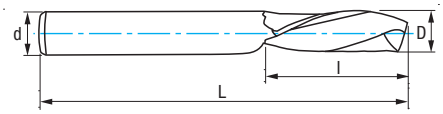


- **Agujeros de desagüe en perfilería metálica.**
- **For drain holes and slots of window profiles.**
- Trous de drainage dans les profils métalliques.



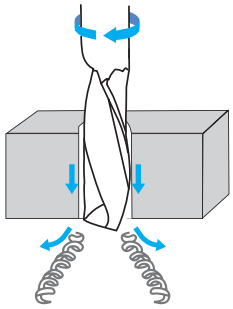
# Ref. 9456

## FRESA METAL DURO 1Z PULIDO ESPEJO HÉLICE IZQUIERDA ALUMINIO
Aluminium Left Helix 1Z Polished Carbide End Mill
Fraise carbure 1Z polyglass hélice à gauche aluminium




**MD**/HM Carbure Micrograno+ | IRIS | IZAR Std. | | 1 Z | | | DIN 6535 HA | | **Pulido Espejo** Mirror Polished Polyglass

| | | |
|---|---|---|
| **CORTE DERECHA** | Right cut | Coupe Droite |
| **HÉLICE IZQUIERDA** | Left helix | Hélice à gauche |



| | | |
|---|---|---|
| **EXTRACCIÓN DE VIRUTA** | Chip Evacuation | Évacuation des copeaux |

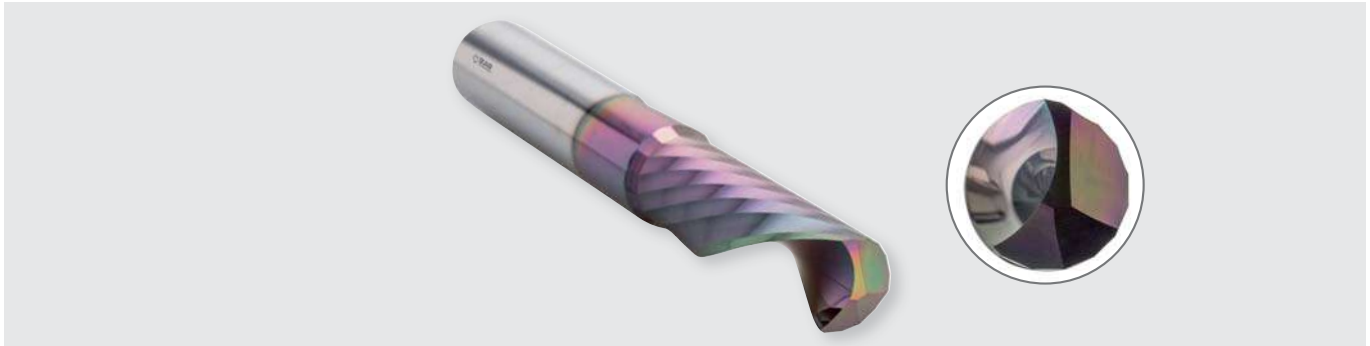
| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 1 | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 |
| N | N.3 | 100-300 | 0,012 | 0,020 | 0,030 | 0,050 | 0,050 | 0,080 |
| | N.4 | 100-300 | 0,012 | 0,020 | 0,030 | 0,050 | 0,050 | 0,080 |
| | N.5 | 100-300 | 0,012 | 0,020 | 0,030 | 0,050 | 0,050 | 0,080 |
| | N.6 | 100-200 | 0,010 | 0,015 | 0,020 | 0,030 | 0,030 | 0,040 |
| | N.7 | 50-125 | 0,008 | 0,010 | 0,015 | 0,025 | 0,025 | 0,030 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

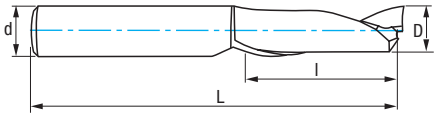
**K = 1**
**Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | New! N° Art. IRIS | € |
|---|---|---|---|---|---|---|---|---|
| **1,00** | 3,00 | 38 | 4 | 1 | 78368 | **10,79** | 60283 | **13,49** |
| **1,50** | 3,00 | 38 | 4 | 1 | 78369 | **10,79** | 60527 | **13,49** |
| **2,00** | 3,00 | 38 | 6 | 1 | 78370 | **10,79** | 60533 | **13,49** |
| **2,50** | 3,00 | 38 | 6 | 1 | 78377 | **10,79** | 60641 | **13,49** |
| **3,00** | 3,00 | 38 | 12 | 1 | 78379 | **16,63** | 60734 | **20,80** |
| **4,00** | 4,00 | 45 | 15 | 1 | 78381 | **19,46** | 60746 | **24,32** |
| **5,00** | 5,00 | 50 | 22 | 1 | 78383 | **24,04** | 60812 | **30,06** |
| **6,00** | 6,00 | 50 | 17 | 1 | 78496 | **35,40** | 60821 | **44,25** |
| **8,00** | 8,00 | 60 | 25 | 1 | 78497 | **48,17** | 60923 | **60,21** |
| **10,00** | 10,00 | 75 | 32 | 1 | 78498 | **73,61** | 60926 | **92,02** |
| **12,00** | 12,00 | 75 | 35 | 1 | 78499 | **89,26** | 61712 | **111,58** |



# Ref. 9419

## FRESA METAL DURO 1Z ALUMINIO
Aluminium 1Z Carbide End Mill
Fraise carbure 1Z aluminium




**MD**/HM Carbure Micrograno+ | ALTIN | IZAR Std. | | 1 Z | 30° | DIN 6535 HA |

| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | ALTIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 |
| N | N.3 | 100-350 | 140-420 | 0,030 | 0,050 | 0,050 | 0,080 |
| | N.4 | 100-350 | 140-420 | 0,030 | 0,050 | 0,050 | 0,080 |
| | N.5 | 100-350 | 140-420 | 0,030 | 0,050 | 0,050 | 0,080 |
| | N.6 | 100-200 | 140-280 | 0,020 | 0,030 | 0,030 | 0,040 |
| | N.7 | 50-125 | 70-175 | 0,015 | 0,025 | 0,025 | 0,030 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

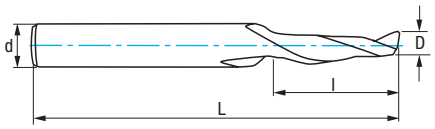
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = 1**
**Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|---|
| **3,00** | 3,00 | 38 | 12 | 1 | 58984 | **13,98** | 59195 | **21,41** |
| **4,00** | 4,00 | 40 | 15 | 1 | 58856 | **17,01** | 59196 | **24,33** |
| **5,00** | 5,00 | 50 | 16 | 1 | 58857 | **21,03** | 59197 | **28,15** |
| **6,00** | 6,00 | 50 | 18 | 1 | 58859 | **24,98** | 59198 | **31,91** |
| **8,00** | 8,00 | 63 | 22 | 1 | 58860 | **37,91** | 59199 | **45,50** |
| **10,00** | 10,00 | 72 | 30 | 1 | 58862 | **53,00** | 59201 | **59,70** |

# Ref. 9413

## FRESA METAL DURO 1Z TERMOPLÁSTICOS
Thermoplastics 1Z Carbide End Mill
Fraise carbure 1Z thermoplastiques




| **MD**/HM Carbure Micrograno+ | CARBEX | IZAR Std. | | 1 Z | 30° | DIN 6535 HA | Tol.* D (k10) d (h6) | *øD=ød → Tol. D (js14) d (h6) |
|---|---|---|---|---|---|---|---|---|

| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | |
|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | CARBEX | Ø 4 | Ø 6 | Ø 8 |
| N | N.3 | 100-350 | 140-420 | 0,020 | 0,050 | 0,050 |
| | N.4 | 100-350 | 140-420 | 0,040 | 0,050 | 0,050 |
| | N.5 | 100-350 | 140-420 | 0,080 | 0,050 | 0,050 |
| | N.6 | 100-200 | 140-280 | 0,010 | 0,030 | 0,030 |
| | N.7 | 50-125 | 70-175 | 0,012 | 0,025 | 0,025 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

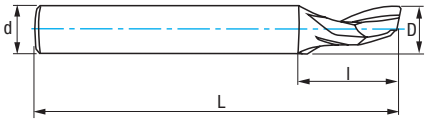
**K = 1**
**Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | N° Art. CARBEX | € |
|---|---|---|---|---|---|---|---|---|
| **2,50** | 6,00 | 50 | 12 | 1 | 43300 | **37,74** | 43299 | **54,24** |
| **3,00** | 6,00 | 50 | 12 | 1 | 43302 | **37,74** | 43311 | **54,24** |
| **4,00** | 6,00 | 50 | 15 | 1 | 43303 | **37,74** | 43312 | **54,24** |
| **5,00** | 6,00 | 50 | 15 | 1 | 43307 | **37,74** | 43314 | **54,24** |
| **6,00** | 6,00 | 50 | 18 | 1 | 43309 | **37,74** | 43315 | **54,24** |

- **Aplicación en plásticos, polyester, fibra... con un rendimiento 40% mayor que una fresa convencional gracias a su recubrimiento CARBEX.**
- **For plastics, polyester, fibre... 40% better performance than conventional end mills thanks to its CARBEX coating.**
- Utilisation sur des plastiques, polyester, fibre... avec un rendement 40% de plus par apport a une fraise conventionelle grâce a son revêtement CARBEX.

# Ref. 9411

## FRESA METAL DURO 1Z TERMOPLÁSTICOS
Thermoplastics 1Z Carbide End Mill
Fraise carbure 1Z thermoplastiques




**MD**/HM Carbure Micrograno+ | ALTIN | IZAR Std. | 1 Z

30° | DIN 6535 HA | Tol. D (h10) d (h6)

| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | ALTIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 |
| N | N.3 | 100-350 | 140-420 | 0,010 | 0,050 | 0,050 | 0,080 |
| | N.4 | 100-350 | 140-420 | 0,010 | 0,050 | 0,050 | 0,080 |
| | N.5 | 100-350 | 140-420 | 0,010 | 0,050 | 0,050 | 0,080 |
| | N.6 | 100-200 | 140-280 | 0,020 | 0,030 | 0,030 | 0,040 |
| | N.7 | 50-125 | 70-175 | 0,015 | 0,025 | 0,025 | 0,030 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

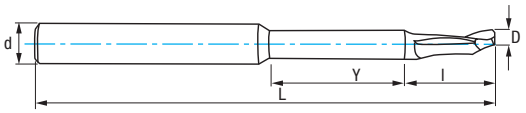
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = 1**
**Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|---|
| **3,00** | 3,00 | 38 | 12 | 1 | 13075 | **13,98** | 13114 | **21,41** |
| **4,00** | 4,00 | 40 | 12 | 1 | 13078 | **17,01** | 13123 | **24,33** |
| **5,00** | 5,00 | 50 | 12 | 1 | 13084 | **21,03** | 13126 | **28,15** |
| **6,00** | 6,00 | 50 | 14 | 1 | 13096 | **24,98** | 13135 | **31,91** |
| **8,00** | 8,00 | 63 | 15 | 1 | 13105 | **37,91** | 13138 | **45,50** |
| **10,00** | 10,00 | 72 | 15 | 1 | 13111 | **53,00** | 13144 | **59,70** |

# Ref. 9414

## FRESA METAL DURO 1Z SERIE LARGA
1Z Long Series Carbide End Mill
Fraise carbure série longue 1Z




| | | | | |
|---|---|---|---|---|
| **MD**/HM Carbure Micrograno+ | IZAR Std. W | | 1 Z | DIN 6535 HA |

| | | |
|---|---|---|
| Tol.* D (k10) d (h6) | *øD=ød → Tol. D (js14) d (h6) | **Serie Larga** Long Series Série Longue |

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | |
|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 4 | Ø 6 | Ø 8 | Ø 10 |
| N | N.3 | 100-200 | 0,005 | 0,025 | 0,030 | 0,040 |
| | N.4 | 100-200 | 0,005 | 0,025 | 0,030 | 0,040 |
| | N.5 | 100-200 | 0,005 | 0,025 | 0,030 | 0,040 |
| | N.4 | 100-200 | 0,020 | 0,030 | 0,030 | 0,040 |
| | N.5 | 50-125 | 0,015 | 0,025 | 0,025 | 0,030 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

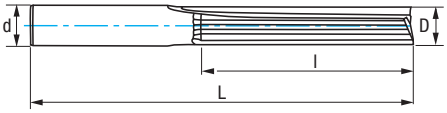
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = 1**
**Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Y mm | Z | N° Art. MD/HM | € |
|---|---|---|---|---|---|---|---|
| **4,00** | 8,00 | 80 | 16 | 29 | 1 | 42847 | **59,71** |
| **5,00** | 8,00 | 80 | 16 | 29 | 1 | 42848 | **59,71** |
| **6,00** | 8,00 | 90 | 16 | 29 | 1 | 42851 | **59,71** |
| **8,00** | 8,00 | 100 | 28 | 40 | 1 | 42865 | **77,88** |
| **10,00** | 10,00 | 120 | 40 | 40 | 1 | 42868 | **107,46** |

# Ref. 1689

## FRESA METAL DURO 2Z TERMOPLÁSTICOS
Thermoplastics 2Z Carbide End Mill
Fraise carbure 2Z thermoplastiques




| **MD**/HM Carbure Micrograno | IZAR Std. | | 2 Z | DIN 6535 HA | **Espumas EVA** Foam Caoutchouc | **Madera** Wood Bois | **Plásticos** Plastics Plastiques |
|---|---|---|---|---|---|---|---|

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM/Carb. | Ø 1 | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 |
| N | N.3 | 100-350 | 0,010 | 0,020 | 0,030 | 0,040 | 0,050 | 0,060 |
| | N.6 | 100-200 | 0,010 | 0,015 | 0,020 | 0,030 | 0,030 | 0,040 |
| F | | 50-125 | 0,005 | 0,010 | 0,015 | 0,025 | 0,025 | 0,030 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = 1**
**Coeficiente corrección**
**Correction coefficient**
Coéficient correction

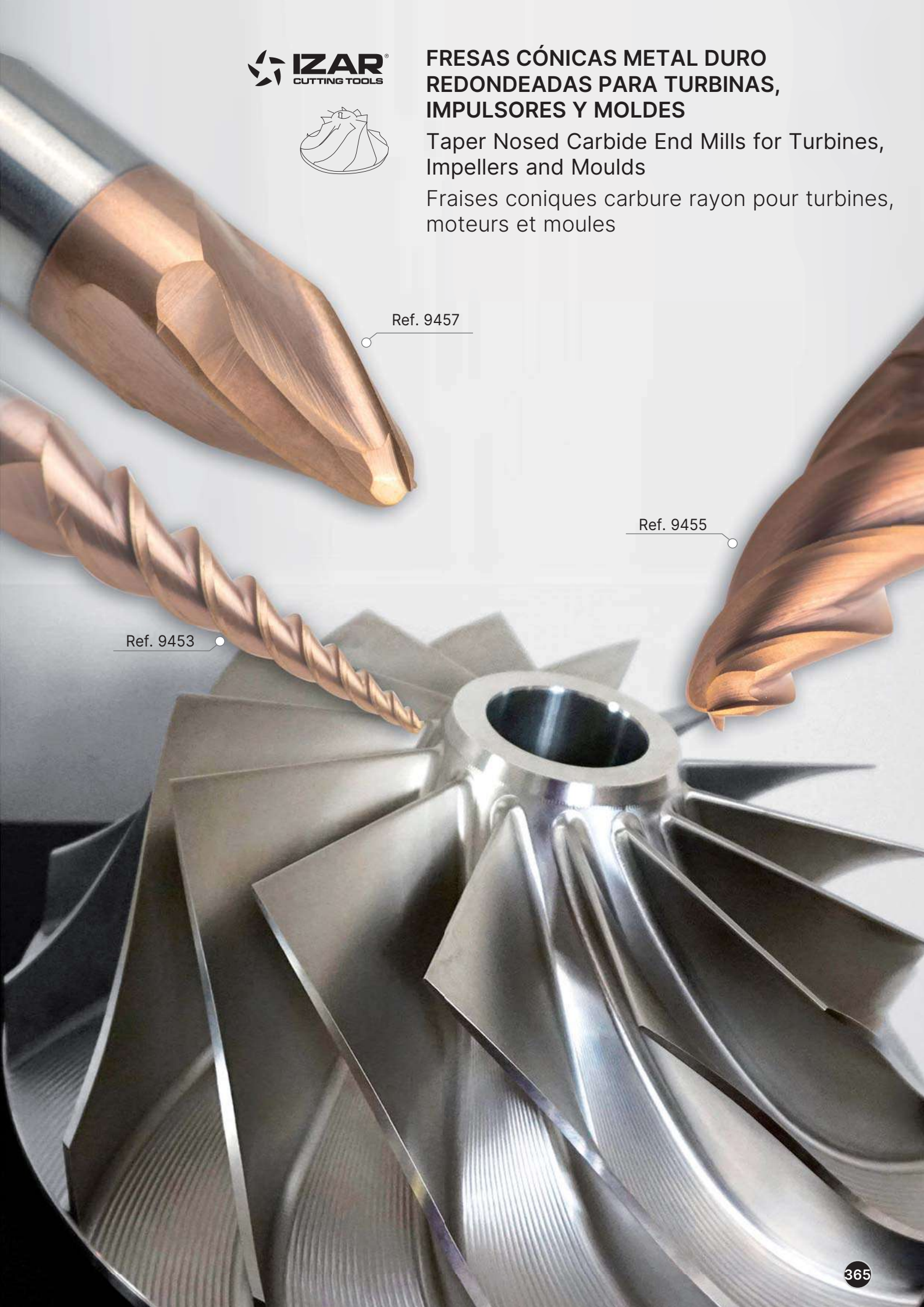
| D mm | d mm | L mm | l mm | Z | | N° Art. MD/HM | € |
|---|---|---|---|---|---|---|---|
| **1,00** | 3,00 | 38 | 3 | 2 | 1 | 79346 | **9,49** |
| **1,50** | 3,00 | 38 | 7 | 2 | 1 | 79421 | **9,49** |
| **2,00** | 3,00 | 38 | 17 | 2 | 1 | 79422 | **9,49** |
| **2,50** | 3,00 | 38 | 17 | 2 | 1 | 79423 | **9,49** |
| **3,00** | 3,00 | 55 | 32 | 2 | 1 | 79435 | **10,70** |
| **4,00** | 4,00 | 65 | 42 | 2 | 1 | 79436 | **20,05** |
| **6,00** | 6,00 | 70 | 42 | 2 | 1 | 79437 | **26,38** |
| **8,00** | 8,00 | 75 | 42 | 2 | 1 | 79438 | **41,20** |
| **10,00** | 10,00 | 85 | 42 | 2 | 1 | 79440 | **78,51** |

- **Geometría Multi Material válida para una amplia gama de productos como espumas, acrílicos, PVC, ABS, tableros, madera contrachapada, resinas, nylon, etc.**
- **Special Multi Material geometry suitable for a wide range of products such as foams, acrylic, PVC, ABS, hardwood, plywood, resins, nylon, etc.**
- Géométrie Multi Matériaux pour une gamme large de produits comme mousses, acryliques, PVC, ABC, tableaux, bois contreplaqués, résines, nylon, etc.
- **Utilizado en el mecanizado de las espumas de bandejas de herramientas.**
- **Machining of tool tray foams.**
- Usinage des mousses des plateaux d'outils.

# FRESAS CÓNICAS METAL DURO REDONDEADAS PARA TURBINAS, IMPULSORES Y MOLDES

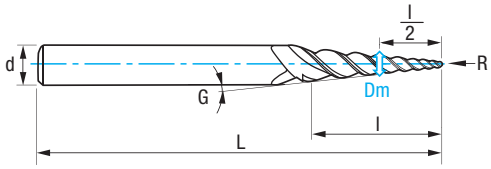
## Taper Nosed Carbide End Mills for Turbines, Impellers and Moulds

## Fraises coniques carbure rayon pour turbines, moteurs et moules

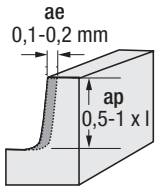


# Ref. 9453

## FRESA METAL DURO CÓNICA REDONDEADA 1 RADIO
1-Radius Tapered Ball Nose Carbide End Mill
Fraise carbure conique 1 rayon




| **MD**/HM Carbure Grano UF | SUA | IZAR Std. | | 3 Z | 45° | DIN 6535 HA |
|---|---|---|---|---|---|---|




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | |
|---|---|---|---|---|
| Grupo | Sub. | SUA | R=0,5 | R=1,0 |
| P | P.1 | 105 | 0,005 | 0,010 |
| | P.2 | 90 | 0,004 | 0,008 |
| | P.3 | 70 | 0,004 | 0,008 |
| | P.4 | 65 | 0,003 | 0,006 |
| | P.5 | 55 | 0,003 | 0,006 |
| K | K.1 | 110 | 0,004 | 0,008 |
| | K.2 | 80 | 0,003 | 0,006 |
| S | | 40 | 0,003 | 0,006 |
| N | N.1 | 80 | 0,004 | 0,008 |
| | N.3 | 260 | 0,006 | 0,012 |
| | N.4 | 180 | 0,006 | 0,012 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times Dm}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

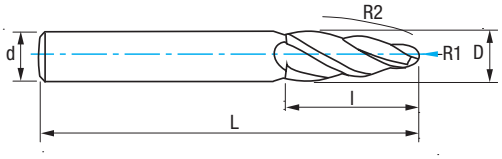
| Dm | R | G | l | L | d | Z | N° Art. SUA | € |
|---|---|---|---|---|---|---|---|---|
| **3,00** | 0,5 | 6° | 20 | 60 | 6,00 | 3 | 79381 | **92,31** |
| **3,40** | 0,5 | 8° | 18 | 60 | 6,00 | 3 | 79386 | **92,31** |
| **3,80** | 1,00 | 6° | 19 | 60 | 6,00 | 3 | 79387 | **92,31** |
| **3,85** | 1,00 | 8° | 15 | 60 | 6,00 | 3 | 79388 | **92,31** |

**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

- **Fresa multi funcional con diferentes ángulos de conicidad.**
- **Válido para acabados en todo tipo de materiales.**
- **Adecuado para máquinas CNC de 5 ejes para cuyo programa facilitamos los perfiles de las fresas en formato .dxf (CAD-CAM).**
- **Para trabajos de difícil accesibilidad.**
- **Multi-functional end mill available in various taper angles.**
- **Suitable for finishing in almost all kind of materials.**
- **Suitable for 5-Axis machining. Profiles of the end mills are available in .dxf format (CAD-CAM).**
- **Suitable for hard to reach areas.**
- Fraise multifunction avec diffèrent angles de conicité.
- Valide pour finitions dans tout type des matériaux.
- Valide pour machines 5-axes. Profils des fraises disponibles en format .dxf (CAD-CAM).
- Pour travaux de difficile accès.

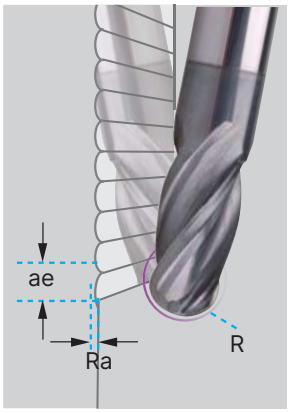
# Ref. 9455

## FRESA METAL DURO CÓNICA REDONDEADA 2 RADIOS
2-Radius Tapered Ball Nose Carbide End Mill
Fraise carbure conique 2 rayons

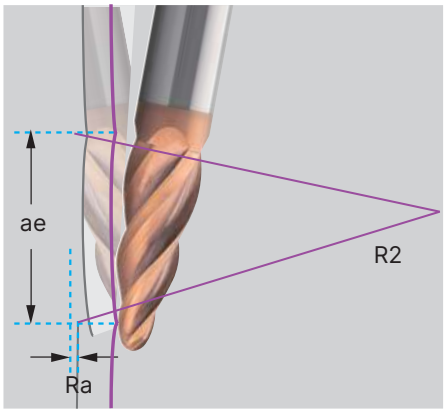



| MD/HM Carbure Grano UF | SUA | IZAR Std. | | 3-4 Z | 30° | DIN 6535 HA |
|---|---|---|---|---|---|---|

Fresa estándar
Standard End Mill - Fraise standard




Ref. **9455**




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) Feed - Pas | |
|---|---|---|---|---|
| Grupo | Sub. | SUA | D=8 | D=10 |
| P | P.1 | 375 | 0,025 | 0,030 |
| | P.2 | 320 | 0,025 | 0,030 |
| | P.3 | 300 | 0,016 | 0,020 |
| | P.4 | 265 | 0,016 | 0,020 |
| | P.5 | 130 | 0,032 | 0,040 |
| K | K.1 | 250 | 0,024 | 0,030 |
| | K.2 | 200 | 0,024 | 0,030 |
| S | | 80 | 0,032 | 0,030 |
| N | N.1 | 260 | 0,024 | 0,030 |
| | N.3 | 500 | 0,032 | 0,040 |
| H | | 110 | 0,032 | 0,040 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = 1**
**Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D | R1 | R2 | l | L | d | Z | N° Art. SUA | € |
|---|---|---|---|---|---|---|---|---|
| **8,00** | 1,00 | 90 | 25 | 75 | 8,00 | 3 | 79389 | **122,94** |
| **10,00** | 2,00 | 85 | 25 | 75 | 10,00 | 4 | 79391 | **135,87** |

**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

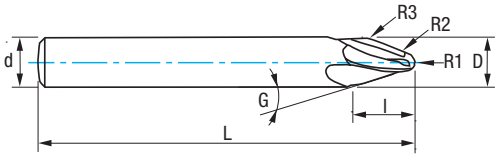
- **Manteniendo la misma rugosidad superficial (Ra), con la fresa 9455 conseguimos una mayor altura de trabajo (ae), avanzando en el mecanizado hasta 10 veces más rápido que con una fresa de cabeza esférica convencional usada habitualmente en este tipo de trabajos.**
- **Geometría especial tipo barril con muy bajas vibraciones en el mecanizado. Alta eficiencia en acabados.**
- **Especial para acabados redondeados tanto internos como externos, como por ejemplo juntas de tubos de combustible en la industria de la aviación.**
- **Adecuado para máquinas CNC de 5 ejes para cuyo programa facilitamos los perfiles de las fresas en formato .dxf (CAD-CAM).**

- **Keeping the same surface roughness (Ra). Our ref. 9455 end mill increases the working height (ae) at a constant roughness value. Up to 10 times faster than a conventional ball nose end mill.**
- **Special barrel geometry for low-vibration machining. High efficiency finishing.**
- **Finishing of the round inner and outer contours; for instance flanges of fuel pipes in aviation industry.**
- **Suitable for 5-Axis machining. Profiles of the end mills are available in .dxf format (CAD-CAM).**

- Avec la même rugosité de surface (Ra), avec la fraise 9455, nous obtenons une plus grande hauteur de travail (ae), en avançant dans l'usinage jusqu'à 10 fois plus vite qu'avec une fraise hémisphérique conventionnelle couramment utilisée dans ce type de travail.
- Géométrie spécial tonneau avec très faibles vibrations quand usinage. Haute efficacité dans les finitions.
- Spécial pour finitions arrondies internes et aussi externes, telles que par exemple joints de tubes de carburant dans l'industrie de l'aviation.
- Valide pour machines 5-axes. Profils des fraises disponibles en format .dxf (CAD-CAM).

# Ref. 9457

## FRESA METAL DURO CÓNICA REDONDEADA 3 RADIOS
3-Radius Tapered Ball Nose Carbide End Mill
Fraise carbure conique 3 rayons




| **MD**/HM Carbure Grano UF | SUA | | 3 Z | IZAR Std. | DIN 6535 HA |
|---|---|---|---|---|---|

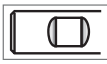
| Material | | Vc (m/min) | Avances fz/rev. (mm/z) Feed - Pas | |
|---|---|---|---|---|
| Grupo | Sub. | SUA | D=8 | D=10 |
| P | P.1 | 375 | 0,028 | 0,035 |
| | P.2 | 320 | 0,028 | 0,035 |
| | P.3 | 300 | 0,028 | 0,025 |
| | P.4 | 265 | 0,028 | 0,025 |
| | P.5 | 130 | 0,032 | 0,035 |
| K | K.1 | 250 | 0,048 | 0,050 |
| | K.2 | 200 | 0,032 | 0,040 |
| S | | 80 | 0,024 | 0,030 |
| N | N.1 | 260 | 0,032 | 0,045 |
| | N.3 | 500 | 0,024 | 0,035 |
| H | | 110 | 0,040 | 0,035 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

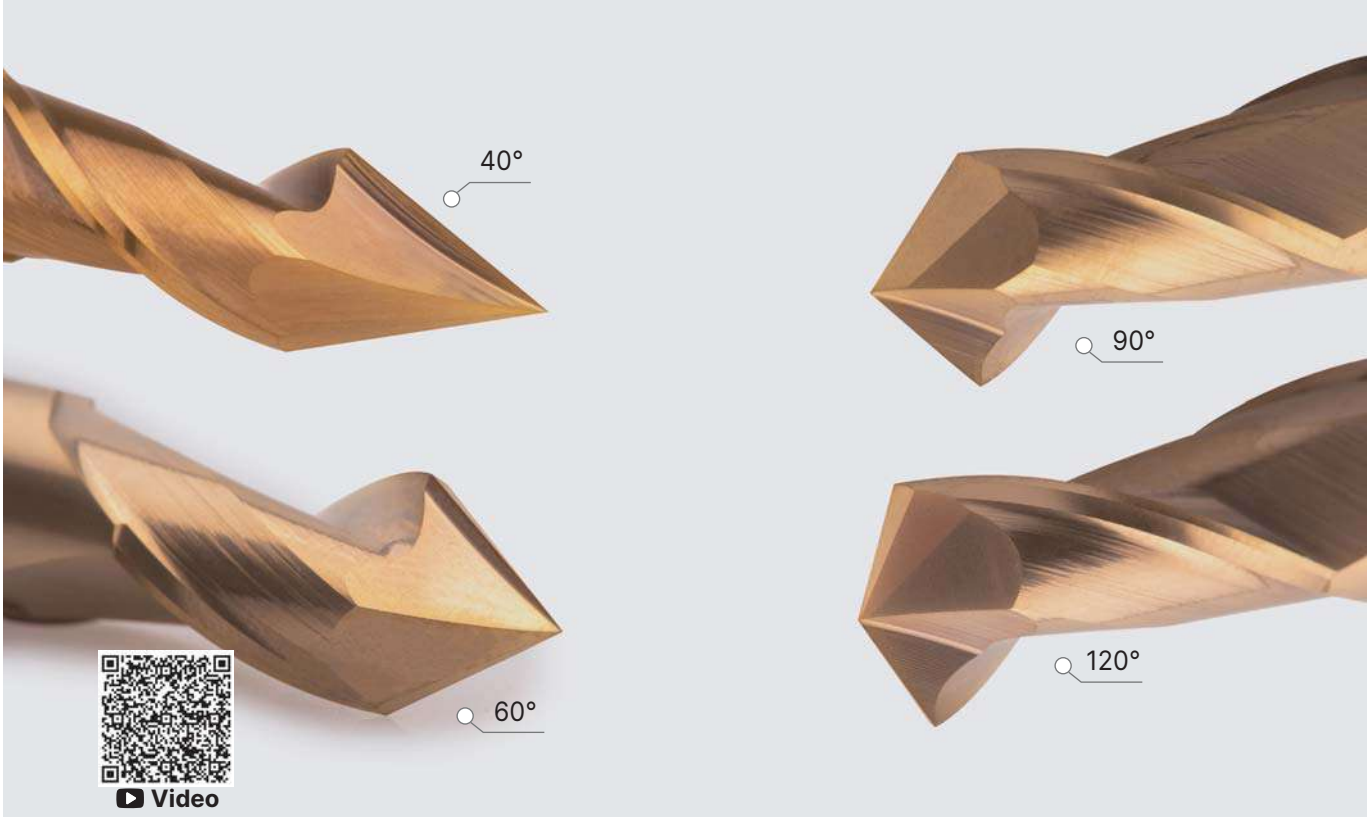
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D | d | R1 | R2 | R3 | G | l | L | Z | N° Art. SUA | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **8,00** | 8,00 | 1,50 | 250 | 4 | 20 | 10,50 | 75 | 3 | 79392 | **122,94** |
| **10,00** | 10,00 | 2,00 | 250 | 5 | 20 | 12,50 | 75 | 3 | 79394 | **135,87** |

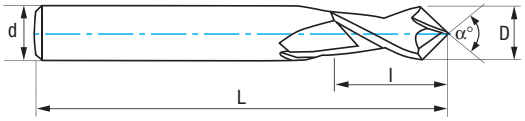

**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

- **Geometría especial tipo barril con muy bajas vibraciones en el mecanizado. Alta eficiencia en acabados.**
- **Válido para acabados en alta velocidad en todo tipo de materiales.**
- **Adecuado para máquinas CNC de 5 ejes para cuyo programa facilitamos los perfiles de las fresas en formato .dxf (CAD-CAM).**
- **Special barrel geometry for low-vibration machining. High efficiency finishing.**
- **Suitable for High Speed Finishing in almost all kind of materials.**
- **Suitable for 5-Axis machining. Profiles of the end mills are available in .dxf format (CAD-CAM).**
- Géométrie spécial tonneau avec très faibles vibrations quand usinage. Haute efficacité dans les finitions.
- Spécial pour finitions arrondies internes et aussi externes, telles que par exemple joints de tubes de carburant dans l'industrie de l'aviation.
- Valide pour machines 5-axes. Profils des fraises disponibles en format .dxf (CAD-CAM).




# Ref. 9450

## FRESA METAL DURO MULTIFUNCIÓN PUNTA V
V-Point Multifunction Carbide End Mill
Fraise carbure multifonction-V



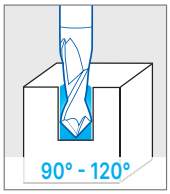

| **MD**/HM Carbure Grano UF | SUA | IZAR Std. | | 2 Z | 30° | DIN 6535 HA | Tol. 3-10mm 0/-0,03 | Tol. >10mm 0/-0,04 |
|---|---|---|---|---|---|---|---|---|

| Material | | Vc (m/min) | Vf Vertical (mm/min) | | | | | | Vf Horizontal (mm/min) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | SUA | Ø 3 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 3 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| P | P.1 | 60 | 25 | 25 | 25 | 25 | 25 | 25 | 50 | 55 | 60 | 65 | 70 | 70 |
| | P.2 | 60 | 25 | 25 | 25 | 25 | 25 | 25 | 50 | 55 | 60 | 65 | 70 | 70 |
| | P.3 | 50 | 20 | 20 | 20 | 20 | 20 | 20 | 40 | 45 | 50 | 55 | 60 | 60 |
| M | | 40 | 20 | 20 | 20 | 20 | 20 | 20 | 40 | 45 | 50 | 55 | 60 | 60 |
| N | N.6 | 100 | 40 | 40 | 40 | 40 | 40 | 40 | 80 | 85 | 90 | 110 | 110 | 120 |
| | N.7 | 100 | 40 | 40 | 40 | 40 | 40 | 40 | 80 | 85 | 90 | 110 | 110 | 120 |

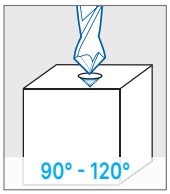
$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

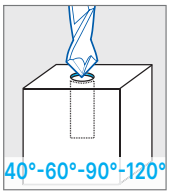
**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction



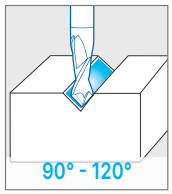

**Taladrado**
Drilling
Perçage



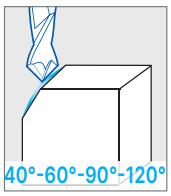

**Punteado**
Spotting
Pointillage



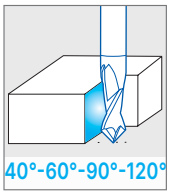

**Avellanado**
Countersinking
Chanfreinage



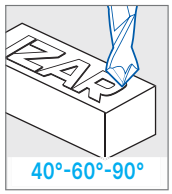

**Ranurado en V**
V Grooving
Rainurage V




**Achaflanado**
Chamfering




**Fresado lateral**
Side milling
Fraisage latéral

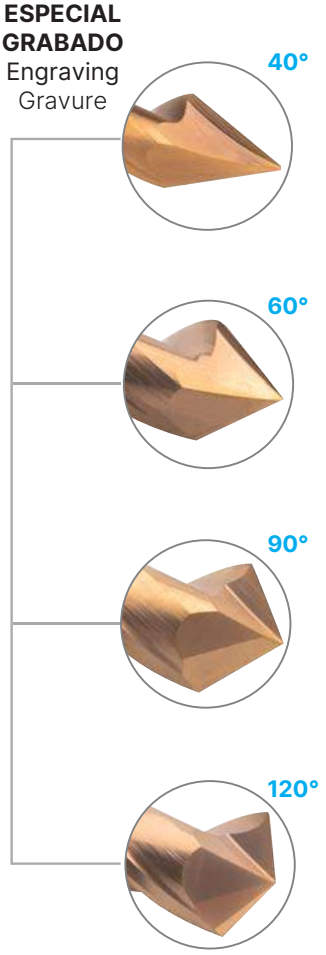



**Grabado**
Engraving
Gravure

# 9450

## FRESA METAL DURO MULTIFUNCIÓN PUNTA V
V-Point Multifunction Carbide End Mill
Fraise carbure multifonction-V

**ESPECIAL GRABADO**
Engraving
Gravure




- **Afilado de precisión**
- High point-geometry accuracy
- Affûtage de précision

| D mm | d mm | L mm | l mm | α ° | Z | N° Art. SUA | € |
|---|---|---|---|---|---|---|---|
| | | | | α=40° | | | |
| **3,00** | 6,00 | 50 | 6 | 40° | 2 | 82435 | **69,03** |
| **4,00** | 6,00 | 50 | 8 | 40° | 2 | 82436 | **69,03** |
| **5,00** | 6,00 | 50 | 10 | 40° | 2 | 82437 | **76,04** |
| **6,00** | 6,00 | 50 | 12 | 40° | 2 | 82438 | **77,59** |
| **8,00** | 8,00 | 60 | 16 | 40° | 2 | 82439 | **92,37** |
| **10,00** | 10,00 | 75 | 20 | 40° | 2 | 82440 | **136,61** |
| **12,00** | 12,00 | 75 | 24 | 40° | 2 | 82441 | **170,56** |
| | | | | α=60° | | | |
| **3,00** | 6,00 | 50 | 6 | 60° | 2 | 78337 | **69,03** |
| **4,00** | 6,00 | 50 | 8 | 60° | 2 | 78339 | **69,03** |
| **5,00** | 6,00 | 50 | 10 | 60° | 2 | 78340 | **76,04** |
| **6,00** | 6,00 | 50 | 12 | 60° | 2 | 78341 | **77,59** |
| **8,00** | 8,00 | 60 | 16 | 60° | 2 | 78342 | **92,37** |
| **10,00** | 10,00 | 75 | 20 | 60° | 2 | 78343 | **136,61** |
| **12,00** | 12,00 | 75 | 24 | 60° | 2 | 78344 | **170,56** |
| | | | | α=90° | | | |
| **3,00** | 6,00 | 50 | 6 | 90° | 2 | 78345 | **69,03** |
| **4,00** | 6,00 | 50 | 8 | 90° | 2 | 78346 | **69,03** |
| **5,00** | 6,00 | 50 | 10 | 90° | 2 | 78347 | **76,04** |
| **6,00** | 6,00 | 50 | 12 | 90° | 2 | 78348 | **77,59** |
| **8,00** | 8,00 | 60 | 16 | 90° | 2 | 78349 | **92,37** |
| **10,00** | 10,00 | 75 | 20 | 90° | 2 | 78350 | **136,61** |
| **12,00** | 12,00 | 75 | 24 | 90° | 2 | 78351 | **170,56** |
| | | | | α=120° | | | |
| **3,00** | 6,00 | 50 | 6 | 120° | 2 | 78352 | **69,03** |
| **4,00** | 6,00 | 50 | 8 | 120° | 2 | 78353 | **69,03** |
| **5,00** | 6,00 | 50 | 10 | 120° | 2 | 78354 | **76,04** |
| **6,00** | 6,00 | 50 | 12 | 120° | 2 | 78355 | **77,59** |
| **8,00** | 8,00 | 60 | 16 | 120° | 2 | 78356 | **92,37** |
| **10,00** | 10,00 | 75 | 20 | 120° | 2 | 78357 | **136,61** |
| **12,00** | 12,00 | 75 | 24 | 120° | 2 | 78358 | **170,56** |

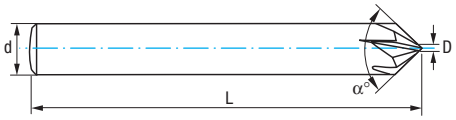
**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

### 3 Pcs

| Cont. | N° Art. SUA | € |
|---|---|---|
| | | Set Price! |
| **6 mm 60°**<br>**6 mm 90°**<br>**6 mm 120°** | 80509 | **221,13** |

# Ref. 9451

## FRESA METAL DURO ACHAFLANADO
Chamfer Carbide End Mill
Fraise carbure chanfreinage




| MD/HM Carbure Micrograno | TIALCN | IZAR Std. | α 90° | 4-6 Z | DIN 6535 HA |
|---|---|---|---|---|---|

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Ø 4 | | | Ø 6 | | | Ø 8 | | | Ø 10 | | | Ø 12 | | |
| Grupo | Sub. | TIALCN | fz(mm) | ap(mm) | ae(mm) | fz(mm) | ap(mm) | ae(mm) | fz(mm) | ap(mm) | ae(mm) | fz(mm) | ap(mm) | ae(mm) | fz(mm) | ap(mm) | ae(mm) |
| P | P.2 | 80-230 | 0,040 | 0,200 | 0,200 | 0,040 | 0,300 | 0,300 | 0,050 | 0,400 | 0,400 | 0,060 | 0,500 | 0,500 | 0,070 | 0,600 | 0,600 |
| | P.3 | 60-180 | 0,040 | 0,200 | 0,200 | 0,040 | 0,300 | 0,300 | 0,050 | 0,400 | 0,400 | 0,060 | 0,500 | 0,500 | 0,070 | 0,600 | 0,600 |
| M | | 45-140 | 0,040 | 0,200 | 0,200 | 0,040 | 0,300 | 0,300 | 0,050 | 0,400 | 0,400 | 0,060 | 0,500 | 0,500 | 0,070 | 0,600 | 0,600 |
| H | | 25-30 | 0,040 | 0,200 | 0,200 | 0,040 | 0,300 | 0,300 | 0,050 | 0,400 | 0,400 | 0,060 | 0,500 | 0,500 | 0,070 | 0,600 | 0,600 |

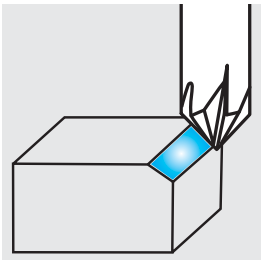
$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

**Para mecanizado a dos caras como en ranuras, reducimos el avance hasta un 30%**
**For double side machining, like in slots, please reduce the feed up to 30%**
Pour usinage à double face, on réduit l'avance jusqu'au 30%

**Para mecanizado vertical tipo taladrado, reducimos el avance hasta un 40%**
**For vertical machining like drilling, please reduce the feed up to 40%**
Pour usinage vertical type perçage, on réduit l'avance jusqu'au 40%



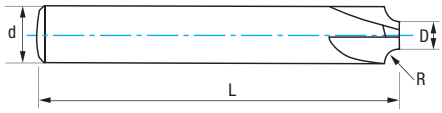
| d mm | D mm | L mm | α ° | Z | N° Art. TIALCN | € |
|---|---|---|---|---|---|---|
| **4,00** | 0,50 | 50 | 90 | 4 | 80557 | **29,61** |
| **6,00** | 1,00 | 60 | 90 | 4 | 80562 | **29,61** |
| **8,00** | 1,50 | 60 | 90 | 5 | 80563 | **44,27** |
| **10,00** | 1,50 | 75 | 90 | 6 | 80564 | **59,40** |
| **12,00** | 2,00 | 75 | 90 | 6 | 80565 | **79,28** |

**DIN 6535 HB**
**Bajo demanda** / upon request / sur demande

- **El diseño específico para achaflanado asegura el mejor acabado posible para este tipo de mecanizado, superior a otras soluciones como pueden ser plaquitas u otro tipo de fresas multifunción o punteado.**
- **Recubrimiento y pulidos especiales que reducen el coeficiente de fricción y aumentan la vida de la herramienta.**
- **The specific chamfering design ensures the best possible surface finishing quality, much superior than other options like carbide inserts or other multipurpose end mills.**
- **Special coating and polishing which reduces the friction coefficient, improving the performance and tool life.**
- Le design spécifique pour chanfreinage assure la meilleure finition possible pour ce type de usinage, supérieur à des autres solutions comme les Plaquettes ou autre type de fraises multifonction.
- Revêtements et polissages spéciaux qui réduisent le coefficient de friction et augmentent la vie utile de l'outil.

# Ref. 9454

## FRESA METAL DURO 4Z 1/4 RADIO
1/4 Corner Radius 4Z Carbide End Mill
Fraise carbure 4Z 1/4 de cercle concave




**MD**/HM/Carbure Grano UF | TIALCN | IZAR Std. | 4 Z | R | DIN 6535 HA

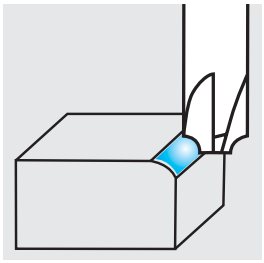
**Refs. 9454 - 9452 - Materiales y condiciones de corte / Materials and Cutting conditions** / Matériaux et conditions de coupe

| Material | | R0,50 | | | R1,00 | | | R1,50 | | | R2,00 | | | R2,50 | | | R3,00 | | | R4,00 | | | R5,00 | | | R6,00 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | fz (mm/min) | | | fz (mm/min) | | | fz (mm/min) | | | fz (mm/min) | | | fz (mm/min) | | | fz (mm/min) | | | fz (mm/min) | | | fz (mm/min) | | | fz (mm/min) | |
| Grupo | Sub. | RPM | Desb. Rough. Ébauch. | Acab. Finish. Finition | RPM | Desb. Rough. Ébauch. | Acab. Finish. Finition | RPM | Desb. Rough. Ébauch. | Acab. Finish. Finition | RPM | Desb. Rough. Ébauch. | Acab. Finish. Finition | RPM | Desb. Rough. Ébauch. | Acab. Finish. Finition | RPM | Desb. Rough. Ébauch. | Acab. Finish. Finition | RPM | Desb. Rough. Ébauch. | Acab. Finish. Finition | RPM | Desb. Rough. Ébauch. | Acab. Finish. Finition | RPM | Desb. Rough. Ébauch. | Acab. Finish. Finition |
| P | P.1 | 8800 | 50 | 80 | 5000 | 50 | 80 | 3000 | 50 | 80 | 2600 | 50 | 80 | 2200 | 50 | 80 | 2000 | 50 | 80 | 1500 | 50 | 80 | 1300 | 50 | 80 | 1200 | 50 | 80 |
| | P.3 | 6400 | 40 | 55 | 3500 | 40 | 55 | 2200 | 40 | 55 | 1900 | 40 | 55 | 1800 | 40 | 55 | 1600 | 40 | 55 | 1200 | 40 | 55 | 960 | 40 | 55 | 880 | 40 | 55 |
| | P.4 | 5100 | 30 | 50 | 3400 | 30 | 50 | 2600 | 30 | 50 | 2200 | 30 | 50 | 2000 | 30 | 50 | 1700 | 30 | 50 | 1300 | 30 | 50 | 1000 | 30 | 50 | 900 | 30 | 50 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

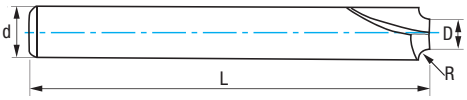


| R mm | D mm | d mm | L mm | Z | N° Art. TIALCN | € |
|---|---|---|---|---|---|---|
| 0,50 | 4,90 | 6,00 | 50 | 4 | 78621 | 59,08 |
| 1,00 | 5,90 | 8,00 | 60 | 4 | 78622 | 81,71 |
| 1,50 | 4,90 | 8,00 | 60 | 4 | 78623 | 81,71 |
| 2,00 | 5,90 | 10,00 | 75 | 4 | 78625 | 114,94 |
| 2,50 | 4,90 | 10,00 | 75 | 4 | 78626 | 114,94 |
| 3,00 | 5,90 | 12,00 | 75 | 4 | 78627 | 142,48 |
| 4,00 | 3,90 | 12,00 | 75 | 4 | 78628 | 142,48 |
| 5,00 | 5,90 | 16,00 | 75 | 4 | 78629 | 189,78 |
| 6,00 | 3,90 | 16,00 | 75 | 4 | 78630 | 189,78 |

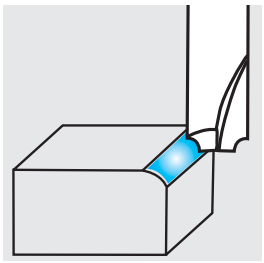
DIN 6535 HB
**Bajo demanda** / upon request / sur demande

# Ref. 9452

## FRESA METAL DURO 2Z 1/4 RADIO
1/4 Corner Radius 2Z Carbide End Mill
Fraise carbure 2Z 1/4 de cercle concave




**MD**/HM/Carbure Grano UF | TIALCN | IZAR Std. | 2 Z | R | DIN 6535 HA

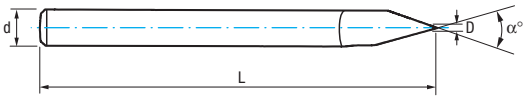


| R mm | D mm | d mm | L mm | Z | N° Art. TIALCN | € |
|---|---|---|---|---|---|---|
| 0,50 | 2,90 | 4,00 | 50 | 2 | 79566 | 56,30 |
| 0,50 | 4,90 | 6,00 | 50 | 2 | 78600 | 56,30 |
| 1,00 | 1,90 | 4,00 | 50 | 2 | 79569 | 56,30 |
| 1,00 | 3,90 | 6,00 | 50 | 2 | 79570 | 56,30 |
| 1,00 | 5,90 | 8,00 | 60 | 2 | 78601 | 77,54 |
| 1,50 | 4,90 | 8,00 | 60 | 2 | 78602 | 77,54 |
| 2,00 | 5,90 | 10,00 | 75 | 2 | 78603 | 108,48 |
| 2,50 | 4,90 | 10,00 | 75 | 2 | 78605 | 108,48 |
| 3,00 | 5,90 | 12,00 | 75 | 2 | 78607 | 135,83 |
| 4,00 | 3,90 | 12,00 | 75 | 2 | 78609 | 135,83 |
| 5,00 | 5,90 | 16,00 | 75 | 2 | 78618 | 180,55 |
| 6,00 | 3,90 | 16,00 | 75 | 2 | 78619 | 180,55 |

DIN 6535 HB
**Bajo demanda** / upon request / sur demande

# Ref. 9459

## FRESA METAL DURO 1Z GRABADO
1Z Engraving Carbide End Mill
Fraise carbure 1Z gravure




**MD**/HM Carbure Micrograno | DIN 6535 HA | 1Z | IZAR Std. | 6000-10000 r.p.m.

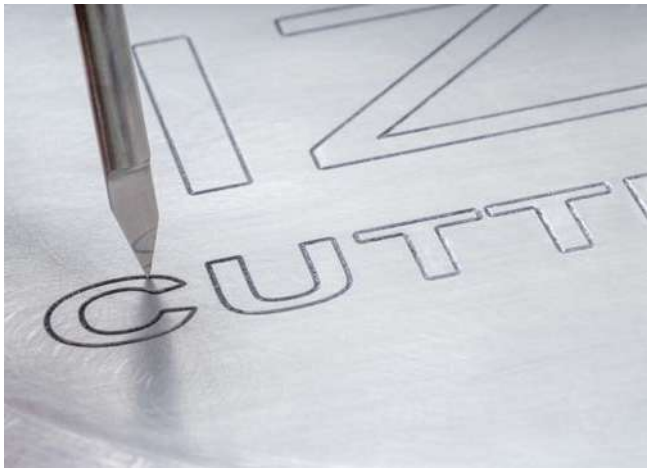
| D mm | d mm | L mm | N° Art. MD/HM | € |
|---|---|---|---|---|
| α=30° | | | | |
| **0,10** | 3,00 | 38 | 81048 | **8,80** |
| **0,20** | 3,00 | 38 | 81049 | **8,80** |
| **0,40** | 3,00 | 38 | 81050 | **8,80** |
| **0,80** | 3,00 | 38 | 81051 | **8,80** |

| D mm | d mm | L mm | N° Art. MD/HM | € |
|---|---|---|---|---|
| α=45° | | | | |
| **0,10** | 3,00 | 38 | 81052 | **8,80** |
| **0,20** | 3,00 | 38 | 81053 | **8,80** |
| **0,20** | 4,00 | 45 | 81062 | **11,63** |
| **0,20** | 6,00 | 50 | 81071 | **18,59** |
| **0,40** | 3,00 | 38 | 81054 | **8,80** |
| **0,40** | 4,00 | 45 | 81063 | **11,63** |
| **0,40** | 6,00 | 50 | 81072 | **18,59** |
| **0,80** | 4,00 | 45 | 81064 | **11,63** |
| **0,80** | 6,00 | 50 | 81077 | **18,59** |
| **2,00** | 6,00 | 50 | 81079 | **18,59** |

| D mm | d mm | L mm | N° Art. MD/HM | € |
|---|---|---|---|---|
| α=60° | | | | |
| **0,10** | 3,00 | 38 | 81055 | **8,80** |
| **0,20** | 3,00 | 38 | 81056 | **8,80** |
| **0,20** | 4,00 | 45 | 81065 | **11,63** |
| **0,20** | 6,00 | 50 | 81080 | **18,59** |
| **0,40** | 3,00 | 38 | 81057 | **8,80** |
| **0,40** | 4,00 | 45 | 81066 | **11,63** |
| **0,40** | 6,00 | 50 | 81081 | **18,59** |
| **0,80** | 4,00 | 45 | 81067 | **11,63** |
| **0,80** | 6,00 | 50 | 81082 | **18,59** |
| **2,00** | 6,00 | 50 | 81083 | **18,59** |

| D mm | d mm | L mm | N° Art. MD/HM | € |
|---|---|---|---|---|
| α=90° | | | | |
| **0,10** | 3,00 | 38 | 81058 | **8,80** |
| **0,20** | 3,00 | 38 | 81059 | **8,80** |
| **0,20** | 4,00 | 45 | 81068 | **11,63** |
| **0,20** | 6,00 | 50 | 81084 | **18,59** |
| **0,40** | 3,00 | 38 | 81060 | **8,80** |
| **0,40** | 4,00 | 45 | 81069 | **11,63** |
| **0,40** | 6,00 | 50 | 81086 | **18,59** |
| **0,80** | 4,00 | 45 | 81070 | **11,63** |
| **0,80** | 6,00 | 50 | 81088 | **18,59** |
| **2,00** | 6,00 | 50 | 81089 | **18,59** |

**ALTIN bajo demanda** / **upon request** / sur demande



**4 Pcs**

| | Cont. Ø | N° Art. MD/HM | € |
|---|---|---|---|
| 1 | **0,1 mm 30°**<br>**0,2 mm 30°**<br>**0,4 mm 30°**<br>**0,8 mm 30°** | 81958 | Set Price!<br>**33,46** |

**4 Pcs**

| | Cont. Ø | N° Art. MD/HM | € |
|---|---|---|---|
| 2 | **0,1 mm 30°**<br>**0,1 mm 45°**<br>**0,1 mm 60°**<br>**0,1 mm 90°** | 81959 | Set Price!<br>**33,46** |

- **Afilado especial para grabado de metales, plásticos y maderas como: Aluminio, Cobre, Hierro, PVC, ABS, Metacrilato acrílico, Paneles bicolores, Madera MDF, etc.**
- **Specially designed geometry for engraving on Metal, Plastic and Wood. Valid for Aluminium, Copper, Iron, PVC, ABS, Acrylic, Bi-color panel, MDF fibreboard, etc.**
- Géométrie spécial pour gravure de métaux, plastiques et bois telles que: Aluminium, cuivre, fer, PVC, ABS, méthacrylate acrylique, panneaux bicolores, bois MDF, etc.

# POLIMEROS REFORZADOS CON FIBRAS
## Fibra de Carbono (CFRP) - Fibra de Vidrio (GFRP)
## Estructuras de panal

# FIBER REINFORCED POLYMERS
## Carbon Fiber (CFRP) - Fiberglass (GFRP)
## Honeycomb materials

# POLYMÈRES DE FIBRES RENFORCÉS
## Fibre de carbone (CFRP) - Fibre de verre (GFRP)
## Matériaux en structure nid d'abeilles

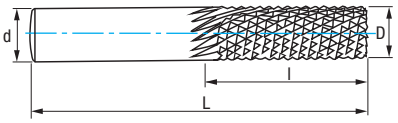
**Los materiales compuestos se forman de al menos dos materiales que combinándolos se obtienen propiedades mecánicas deseadas para multitud de aplicaciones en automoción, en la industria aeroespacial, generación de energía o en material deportivo por ejemplo. Uno de los componentes hará de cohesión y el otro será el material de refuerzo, como pueden ser fibras sintéticas de vidrio o carbono. Esta combinación produce materiales abrasivos que requieren ser mecanizados con fresas de geometrías y recubrimientos especiales que presentamos en esta gama. El acabado final de estas superficies mecanizadas es un factor clave en el diseño de estas fresas, debido a fenómenos típicos de estos materiales, como la delaminación.**

**Composite materials are formed by at least two elements that when combined provide unique mechanical properties for a number of different applications in several industries like automotive, aerospace, power generation or sports equipment. One of the elements acts as the binding agent that form the structure and the other material acts as the reinforcement. This combination produces very abrasive materials which require end mills with special geometries and coatings that we include in this new range. The surface finishing quality is a key factor in these fiber-reinforced composites due to common problems such as delamination, burring or uncut fibers.**

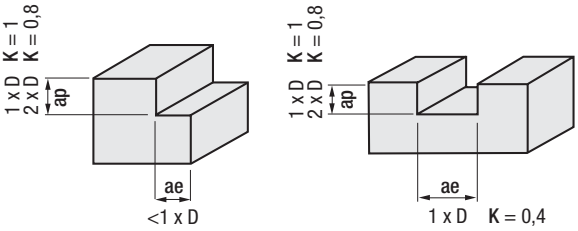
Les matériaux composites sont formés d'au moins deux éléments qui, lorsqu'ils sont combinés, offrent des propriétés mécaniques uniques pour un certain nombre d'applications différentes dans plusieurs secteurs comme l'automobile, l'aérospatiale, la production d'énergie ou les équipements sportifs. Un des éléments agit comme un liant qui forme la structure tandis que l'autre matériau agit comme renfort. Cette combinaison produit des matériaux très abrasifs qui nécessitent des fraises à géométrie spéciale et des revêtements spécifiques, que nous incluons dans cette nouvelle gamme. La qualité de la finition de la surface est un facteur clé dans ces composites renforcés de fibres, en raison de problèmes courants tels que la délamination, l'ébarbage ou les fibres non coupées.

# Ref. 9280

## FRESA METAL DURO COMPOSITES
Composites Carbide End Mill
Fraise lime carbure composites




| MD/HM Carbure Micrograno | IZAR Std. | DIN 6535 HA |
|---|---|---|




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | MD/HM | Ø 3 | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| | | 80-150 | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

K = Coeficiente corrección
Correction coefficient
Coéficient correction

New!

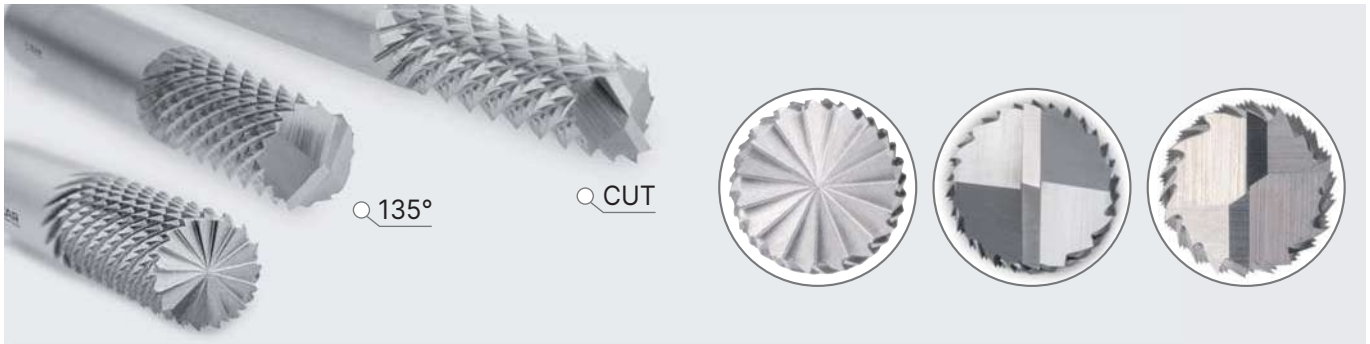
**Canteado**
**Edging**
Bordure

**135°**
**Taladrado**
**Drilling**
Perçage

**CUT**
**Escuadrado / Ranurado**
**Squaring/Slotting**
Carrelage / Rainurage

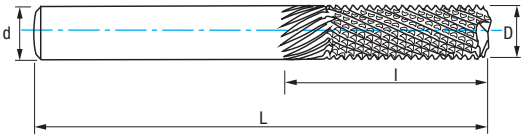
| | D mm | d mm | L mm | l mm | Z | N° Art. MD/HM | € | N° Art. MD/HM | € | N° Art. MD/HM | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| New! | 1,60 | 3,00 | 38 | 5,00 | 5 | 20386 | 9,14 | 20391 | 10,69 | 20399 | 10,69 |
| New! | 2,40 | 3,00 | 38 | 9,50 | 5 | 20387 | 9,14 | 20393 | 10,69 | 20400 | 10,69 |
| | 3,00 | 3,00 | 38 | 12,00 | 7 | 55883 | 9,14 | 82797 | 10,69 | 20401 | 10,69 |
| New! | 4,00 | 4,00 | 50 | 16,00 | 8 | 20390 | 16,81 | 20394 | 18,73 | 20402 | 18,73 |
| | 6,00 | 6,00 | 63 | 19,00 | 10 | 55884 | 18,45 | 82798 | 20,42 | 20404 | 20,42 |
| | 8,00 | 8,00 | 63 | 25,00 | 12 | 82750 | 37,19 | 82799 | 39,47 | 20405 | 39,47 |
| | 10,00 | 10,00 | 63 | 25,00 | 14 | 55886 | 43,27 | 82800 | 45,80 | 20407 | 45,80 |
| | 12,00 | 12,00 | 75 | 30,00 | 17 | 55885 | 64,81 | 82801 | 66,30 | 20408 | 66,30 |

- **Válido para recanteados manuales y CNCs.**
- **Diseñado para un amplio abanico de materiales compuestos incluyendo fibras de vidrio o paneles fenólicos.**
- **Both for hand-machines and CNCs.**
- **Designed for a wide range of composites, including fiberglass and phenolic panels.**
- À la fois pour les machines à main et pour les CNC.
- Conçu pour une large gamme de composites, y compris la fibre de verre et les panneaux phénoliques.

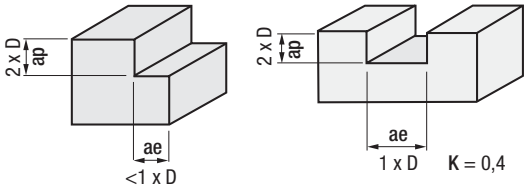


# Ref. 9281

## FRESA METAL DURO DESBASTE FIBRA DE CARBONO / VIDRIO
Roughing Carbide End Mill for Carbon Fiber / Fiberglass
Fraise ébauche carbure fibre carbone / verre




| **MD**/HM Carbure Micrograno+ | DIAMAX | IZAR Std. | DIN 6535 HA |
|---|---|---|---|




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | |
|---|---|---|---|---|---|---|---|
| Grupo | Sub. | DIAMAX | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| F | CFRP* | 140-280 | 0,015 | 0,020 | 0,030 | 0,030 | 0,035 |
| | GFRP* | 120-200 | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 |

*** CFRP:** **Polímero reforzado de Fibra de Carbono**
Carbon Fiber Reinforced Polymer / Polymère renforcé de fibres de carbone

*** GFRP:** **Polímero reforzado de Fibra de Vidrio**
Glass fiber reinforced polymer / Polymère renforcé de fibres de verre

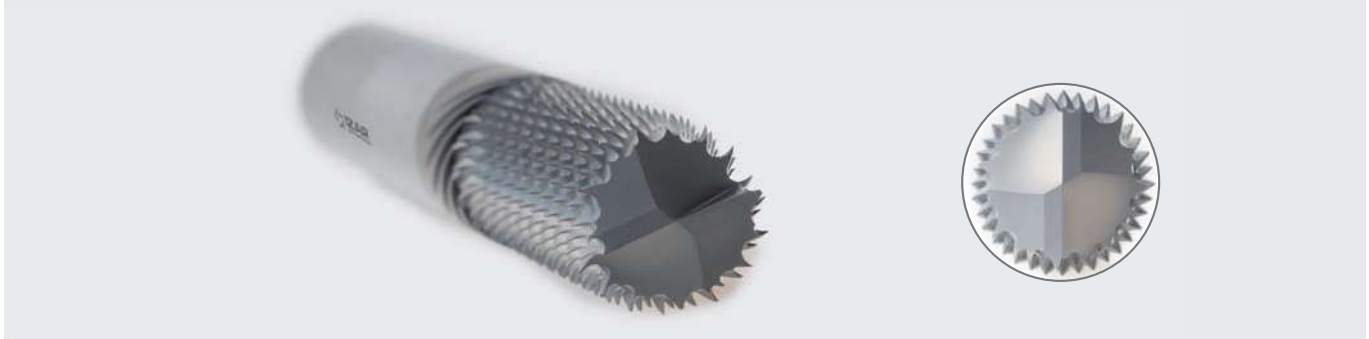
$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

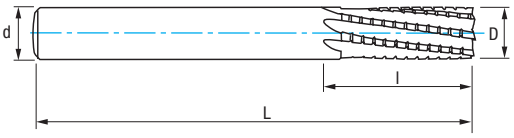
| | D mm | d mm | L mm | l mm | Z | N° Art. DIAMAX | € |
|---|---|---|---|---|---|---|---|
| New! | **3,00** | 6,00 | 60 | 9 | 7 | 25941 | **95,82** |
| | **4,00** | 6,00 | 60 | 12 | 8 | 82758 | **95,82** |
| | **6,00** | 6,00 | 60 | 18 | 11 | 81928 | **95,82** |
| | **8,00** | 8,00 | 60 | 24 | 14 | 81930 | **126,98** |
| | **10,00** | 10,00 | 75 | 30 | 16 | 81932 | **161,98** |
| | **12,00** | 12,00 | 100 | 36 | 17 | 81934 | **201,67** |

- **Diseñado para desbaste en CFRP/GFRP.**
- **Recubrimiento especial DIAMAX, con un espesor extra de diamante nanocristalino.**
- **Special design for CFRP/GFRP rough milling.**
- **Special DIAMAX thick-layer diamond coating for extremely long tool life.**
- Conception spéciale pour le fraisage primaire des CFRP/GFRP.
- Revêtement diamanté spécial DIAMAX en couche épaisse pour une très longue durée de vie des outils.

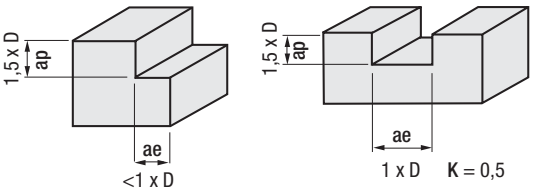


# Ref. 9282

## FRESA METAL DURO ACABADO FIBRA DE CARBONO / VIDRIO
Finishing Carbide End MIll for for Carbon Fiber / Fiberglass
Fraise finition carbure fibre carbone / verre




| **MD**/HM Carbure Micrograno+ | DIAMAX | IZAR Std. | 6-8 Z | DIN 6535 HA | |
|---|---|---|---|---|---|




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | |
|---|---|---|---|---|---|---|
| Grupo | Sub. | DIAMAX | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| F | CFRP* | 160-220 | 0,020 | 0,030 | 0,030 | 0,035 |
| | GFRP* | 100-160 | 0,020 | 0,030 | 0,030 | 0,035 |

*** CFRP: Polímero reforzado de Fibra de Carbono**
Carbon Fiber Reinforced Polymer / Polymère renforcé de fibres de carbone

*** GFRP: Polímero reforzado de Fibra de Vidrio**
Glass fiber reinforced polymer / Polymère renforcé de fibres de verre

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

**Vf (mm/min.) = r.p.m. x Z x fz x K**

| D mm | d mm | L mm | l mm | Z | N° Art. DIAMAX | € |
|---|---|---|---|---|---|---|
| **6,00** | 6,00 | 60 | 15 | 6 | 81936 | **115,04** |
| **8,00** | 8,00 | 60 | 20 | 6 | 81938 | **152,37** |
| **10,00** | 10,00 | 75 | 25 | 8 | 81940 | **194,70** |
| **12,00** | 12,00 | 100 | 30 | 8 | 81942 | **242,40** |

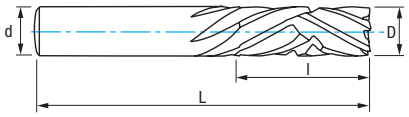
- **Diseño especial para acabados limpios.**
- **Se requiere menos fuerza de mecanizado, alargando notablemente la vida útil de la herramienta.**
- **Con esta fresa se consiguen evitar problemas típicos de los materiales compuestos de fibras, como pueden ser la delaminación, la rebaba o las fibras sueltas sin cortar.**
- **Excelentes resultados en paneles fenólicos.**

- **Unique geometry provide the best surface finish.**
- **Less cutting force required, resulting in a very long tool life.**
- **Avoids typical problems when dealing with fiber composites, which are delamination, burring and uncut fibers.**
- **Excelent results in phenolic panels.**

- Une géométrie unique pour une meilleure finition de surface.
- Moins de force de coupe nécessaire, d'où une très longue durée de vie de l'outil.
- Évite les problèmes typiques rencontrés avec les fibres composites, à savoir la délamination, l'ébarbage et les fibres non coupées.
- Excellents résultats sur panneaux phénoliques.

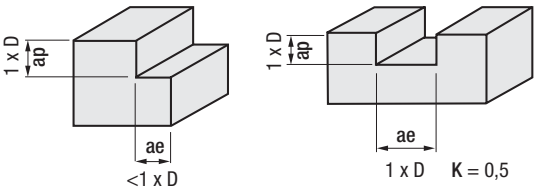
# Ref. 9283

## FRESA METAL DURO DE COMPRESIÓN FIBRA DE CARBONO
Compression Carbide End Mill for Carbon Fiber
Fraise à compression carbure pour fibre carbone




| **MD**/HM Carbure Micrograno+ | DIAMAX | IZAR Std. | | 6 Z | DIN 6535 HA |
|---|---|---|---|---|---|

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | |
|---|---|---|---|---|---|---|
| Grupo | Sub. | DIAMAX | Ø 6 | Ø 8 | Ø 10 | Ø 12 |
| F | CFRP* | 160-220 | 0,015 | 0,020 | 0,025 | 0,030 |



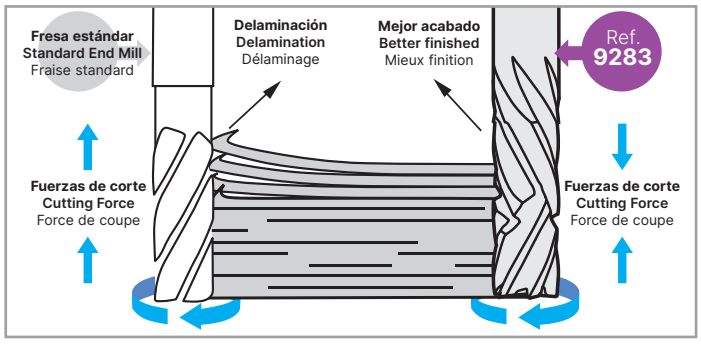

*** CFRP: Polímero reforzado de Fibra de Carbono**
Carbon Fiber Reinforced Polymer
Polymère renforcé de fibres de carbone

**r.p.m.** = $\frac{\text{Vc x 1.000}}{\pi \text{ x } \varnothing}$ **K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**Reducción de los valores de avance en función del grosor de la pieza:**
**Feed reduction in accordance with the material thickness:**
Réduction du pas en fonction de l'épaisseur du matériau:

| Espesor Thickness Épaisseur: | | K |
|---|---|---|
| ≤0,5xD | → | K = 1,50 |
| 0,5xD – 1xD | → | K = 1,20 |
| 1XD – 2xD | → | K = 0,80 |
| 3xD – 4xD | → | K = 0,50 |




| D mm | d mm | L mm | l mm | Z | N° Art. DIAMAX | € |
|---|---|---|---|---|---|---|
| **6,00** | 6,00 | 75 | 30 | 6 | 81944 | **109,10** |
| **8,00** | 8,00 | 75 | 30 | 6 | 81946 | **130,37** |
| **10,00** | 10,00 | 80 | 35 | 6 | 81948 | **157,73** |
| **12,00** | 12,00 | 80 | 35 | 6 | 81950 | **195,20** |

- **Diseño especial para reducir la delaminación.**
- **Esta nueva geometría requiere de menores fuerzas de corte.**
- **Recubrimiento DIAMAX gran espesor especial diamante para una vida de la herramienta extremadamente larga.**
- **Uso alternativo para mecanizar composites tipo panel de abeja aumentando las condiciones de corte x2 aprox.**
- **Special design for reducing delamination.**
- **This new geometry requires less cutting force.**
- **Special DIAMAX thick-layer diamond coating for extremely long tool life.**
- **Alternative use for machining honeycomb-panel-composites increasing cutting conditions aprox. x2.**
- Conception spéciale pour réduire la délamination.
- Cette nouvelle géométrie nécessite moins de force de coupe.
- Revêtement diamanté spécial DIAMAX en couche épaisse pour une très longue durée de vie des outils.
- Utilisation alternative pour l'usinage de panneaux composites à structure en nid d'abeilles en augmentant par 2 la dimension de la coupe.

New!

# FRESAS DE ROSCAR
## Thread Mills
## Fraises à fileter

**El fresado de roscas es un proceso versátil y rentable para el corte de una gran variedad de roscas, piezas y materiales a mecanizar en la misma máquina.**
**Se puede utilizar una sola fresa para roscar distintos agujeros con el mismo paso. Esto reduce los costes de sus herramientas y acorta el tiempo de cambio de herramienta. Nuestras fresas de roscar se pueden utilizar para crear roscas tanto internas como externas.**

Thread milling is a versatile and cost-effective process for cutting a wide variety of threads, parts and materials to be machined on the same machine.
A single threading mill can be used to make a wide range of holes with the same pitch. This lowers the cost of your tools and reduces the tool change time. Our threading mills can be used to make both internal and external threads.

Le fraisage de filets est un processus polyvalent et rentable pour la coupe d'une grande variété de filetages, de pièces et de matériaux à usiner sur la même machine.
Une seule fraise à fileter peut être utilisée pour différents trous avec le même pas. Cela réduit les coûts d'outillage et le temps de changement d'outil. Nos fraises à fileter peuvent être utilisées pour créer à la fois des filetages internes et externes.

### DISPONIBLE CON REFRIGERACIÓN INTERNA
Available with internal cooling
Disponible avec lubrification interne

**Tanto la ref. 9330 como la ref. 9333 están disponibles con refrigeración interna. El refrigerante lubrica, elimina virutas y reduce el calor. Esto da como resultado una mayor vida útil de la herramienta y una mayor productividad.**

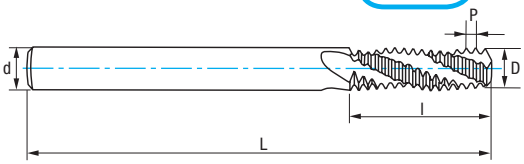
Both ref. 9330 and ref. 9333 are available with internal cooling. The coolant lubricates, removes chips and reduces heat. This results in higher tool life and more productivity.

Les références 9330 et 9333 sont toutes les deux disponibles avec un système de refroidissement interne. Le liquide de refroidissement lubrifie, évacue les copeaux et réduit la chaleur. Cela se traduit par une durée de vie plus longue de l'outil et une productivité accrue.

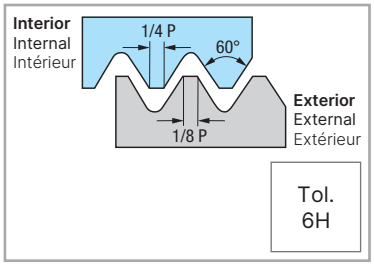
# Ref. 9330

## FRESA DE ROSCAR MULTIPASO
Multi-Pitch Threading Mill
Fraise à fileter multi-pas

New!




| MD/HM Carbure Micrograno | ALTIN | IZAR Std. | 3-4 Z | 30° | DIN 6535 HA | Tol. D (f7) d (h7) |
|---|---|---|---|---|---|---|




$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

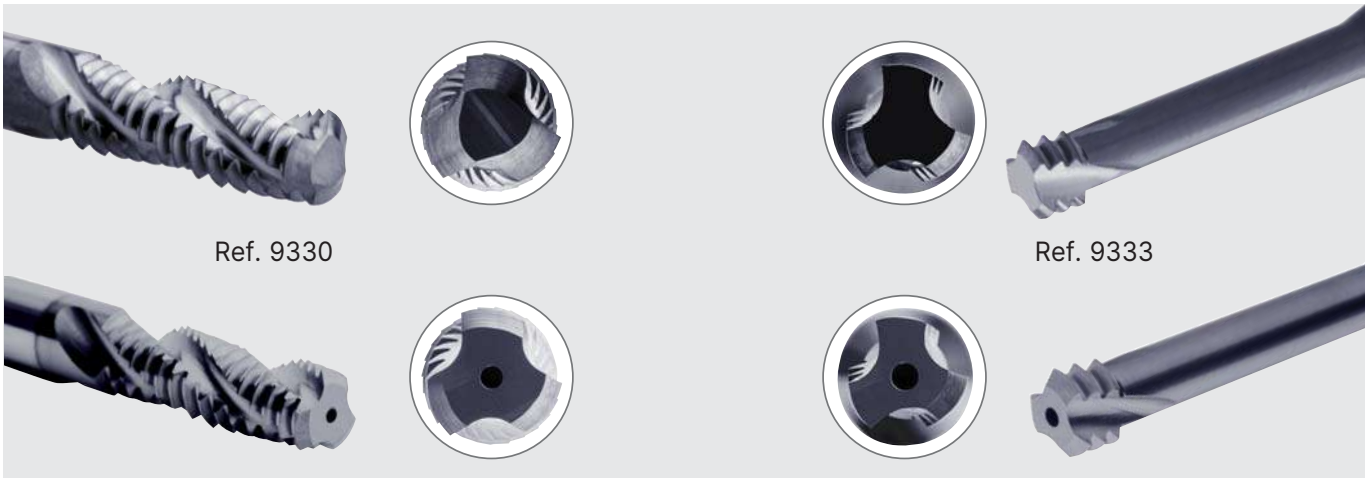
| Material Grupo | Sub. | Vc (m/min) ALTIN |
|---|---|---|
| P | P.1 | 50-75 |
| | P.2 | 50-75 |
| | P.3 | 40-70 |
| M | | 20-40 |
| K | K.1 | 50-100 |
| S | Ti6Al44V | 30-60 |
| | Inconel 718 | 15-30 |
| N | N.1 | 50-100 |
| | N.2 | 50-100 |
| | N.3 | 50-100 |
| | N.4 | 60-130 |
| | N.5 | 60-130 |
| | N.6 | 50-100 |
| H | <50HRC | 15-30 |

| Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|
| M4 | M5 | M6 | M8 | M10 | M12 | M16 | M20 |
| 0,02-0,04 | | 0,03-0,05 | | | | | 0,05-0,10 |

**Sin refrigeración**
**Without coolant**
Sans refroidissemment

**Con refrigeración**
**With coolant**
Avec refroidissement

| M | P | D mm | d mm | L mm | l mm | Z | | N° Art. ALTIN | € | N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 0,70 | 3,10 | 6 | 64 | 9,00 | 3 | 1 | 84642 | 120,71 | 84643 | 138,98 |
| 5 | 0,80 | 4,00 | 6 | 64 | 11,00 | 3 | 1 | 84646 | 120,71 | 84654 | 138,98 |
| 6 | 1,00 | 4,50 | 6 | 64 | 13,50 | 3 | 1 | 84647 | 120,71 | 84655 | 138,98 |
| 8 | 1,25 | 6,00 | 6 | 64 | 18,00 | 3 | 1 | 84648 | 120,71 | 84656 | 138,98 |
| 10 | 1,50 | 7,50 | 8 | 64 | 22,00 | 3 | 1 | 84649 | 165,68 | 84657 | 184,00 |
| 12 | 1,75 | 9,50 | 10 | 70 | 26,00 | 4 | 1 | 84650 | 213,75 | 84658 | 238,19 |
| 14 | 2,00 | 10,00 | 10 | 70 | 30,00 | 4 | 1 | 84651 | 213,75 | 84659 | 238,19 |
| 16 | 2,00 | 12,00 | 12 | 83 | 34,00 | 4 | 1 | 84652 | 263,17 | 84660 | 287,12 |
| 20 | 2,50 | 16,00 | 16 | 100 | 42,00 | 4 | 1 | 84653 | 314,28 | 84661 | 336,11 |



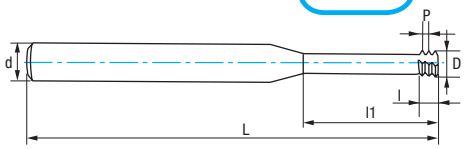
Ref. 9330

Ref. 9333

# Ref. 9333

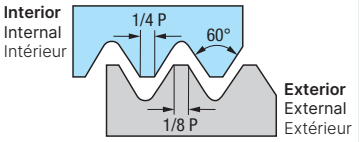
## FRESA DE ROSCAR 3 PASOS
3-Pitch Threading Mill
Fraise à fileter 3-pas

New!




**MD**/HM Carbure Micrograno | ALTIN | IZAR Std.

3-4 Z | 15° | DIN 6535 HA | Tol. D (f7) d (h7)




Tol. 6H

| Material | | Vc (m/min) |
|---|---|---|
| Grupo | Sub. | ALTIN |
| P | P.1 | 50-75 |
| | P.2 | 50-75 |
| | P.3 | 40-70 |
| M | | 35-50 |
| K | K.1 | 50-100 |
| S | Ti6Al44V | 30-60 |
| | Inconel 718 | 15-30 |
| N | N.1 | 50-100 |
| | N.2 | 50-100 |
| | N.3 | 50-100 |
| | N.4 | 60-130 |
| | N.5 | 60-130 |
| | N.6 | 50-100 |
| H | <50HRC | 15-30 |

| Avances fz/rev. (mm/z) - Feed - Pas | | | | |
|---|---|---|---|---|
| M1,6-M2,5 | M3-M5 | M6 | M8-M16 | M20-M36 |
| 0,01-0,04 | 0,02-0,05 | 0,03-0,06 | 0,03-0,07 | 0,05-0,10 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

K = Coeficiente corrección
Correction coefficient
Coéficient correction

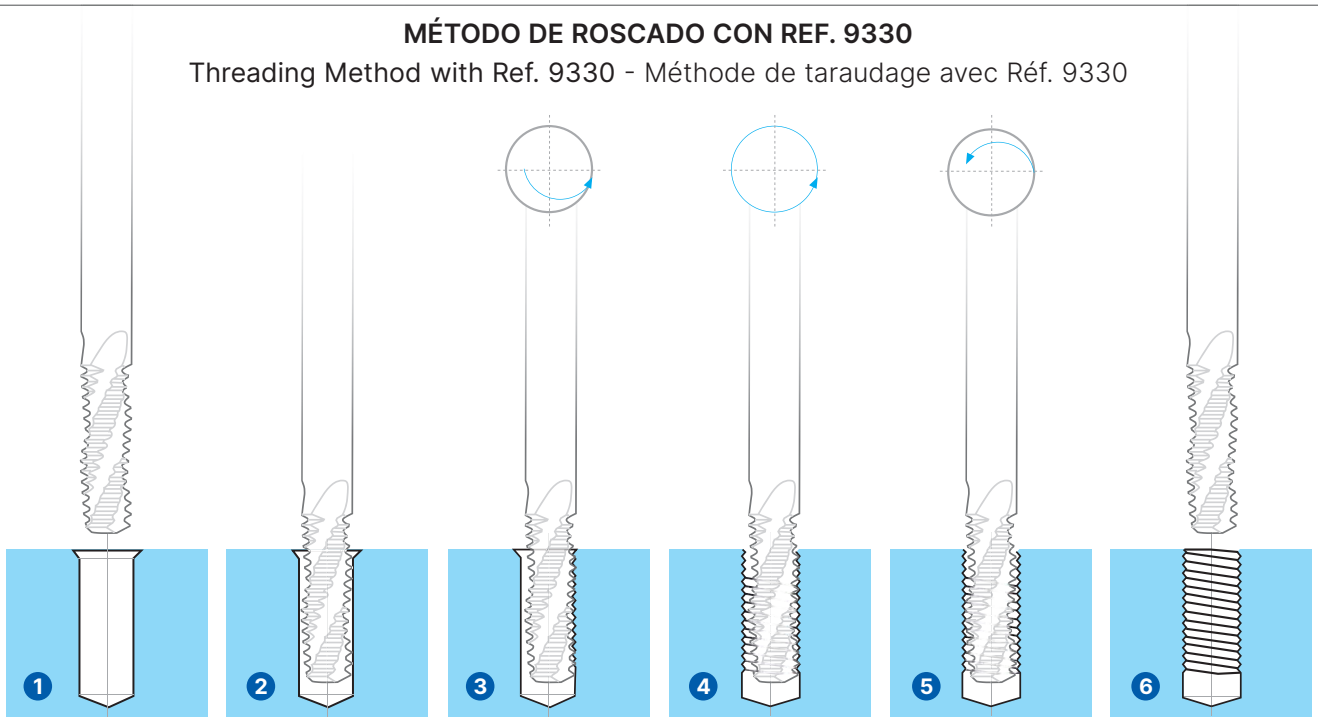
Sin refrigeración
Without coolant
Sans refroidissemment

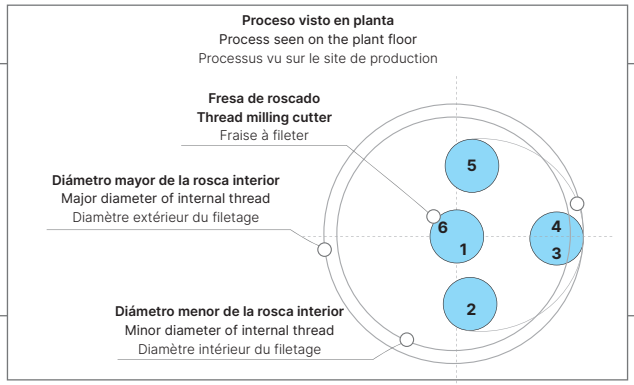
Con refrigeración
With coolant
Avec refroidissement

| M | P | D mm | d mm | L mm | l mm | l1 mm | Z | | N° Art. ALTIN | € | N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,6 | 0,35 | 1,20 | 6 | 64 | 1,10 | 4,80 | 3 | 1 | 84644 | 87,05 | | |
| 1,6 | 0,35 | 1,20 | 6 | 64 | 1,10 | 6,40 | 3 | 1 | 84662 | 89,50 | | |
| 1,6 | 0,35 | 1,20 | 6 | 64 | 1,10 | 8,00 | 3 | 1 | 84663 | 91,94 | | |
| 1,8 | 0,35 | 1,40 | 6 | 64 | 1,10 | 5,40 | 3 | 1 | 84664 | 87,05 | | |
| 1,8 | 0,35 | 1,40 | 6 | 64 | 1,10 | 7,20 | 3 | 1 | 84665 | 89,50 | | |
| 1,8 | 0,35 | 1,40 | 6 | 64 | 1,10 | 9,00 | 3 | 1 | 84666 | 91,94 | | |
| 2 | 0,40 | 1,50 | 6 | 64 | 1,00 | 6,00 | 3 | 1 | 84667 | 87,05 | | |
| 2 | 0,40 | 1,50 | 6 | 64 | 1,20 | 8,00 | 3 | 1 | 84668 | 89,50 | | |
| 2 | 0,40 | 1,50 | 6 | 64 | 1,20 | 10,00 | 3 | 1 | 84669 | 91,94 | | |
| 2,5 | 0,45 | 1,90 | 6 | 64 | 1,40 | 7,50 | 3 | 1 | 84670 | 87,05 | | |
| 2,5 | 0,45 | 1,90 | 6 | 64 | 1,40 | 10,00 | 3 | 1 | 84671 | 89,50 | | |
| 2,5 | 0,45 | 1,90 | 6 | 64 | 1,40 | 12,50 | 3 | 1 | 84672 | 91,94 | | |
| 3 | 0,50 | 2,40 | 6 | 64 | 1,50 | 9,50 | 3 | 1 | 84673 | 87,05 | 84645 | 105,38 |
| 3 | 0,50 | 2,40 | 6 | 64 | 1,50 | 12,00 | 3 | 1 | 84674 | 89,50 | 84704 | 107,67 |
| 3 | 0,50 | 2,40 | 6 | 64 | 1,50 | 15,00 | 3 | 1 | 84675 | 91,94 | 84705 | 109,96 |
| 4 | 0,70 | 3,10 | 6 | 64 | 2,10 | 12,50 | 3 | 1 | 84676 | 87,05 | 84706 | 105,38 |
| 4 | 0,70 | 3,10 | 6 | 64 | 2,10 | 16,00 | 3 | 1 | 84677 | 89,50 | 84707 | 107,67 |
| 4 | 0,70 | 3,10 | 6 | 64 | 2,10 | 20,00 | 3 | 1 | 84678 | 91,94 | 84708 | 109,96 |
| 5 | 0,80 | 4,00 | 6 | 64 | 2,40 | 16,00 | 3 | 1 | 84679 | 87,05 | 84709 | 105,38 |
| 5 | 0,80 | 4,00 | 6 | 64 | 2,40 | 20,00 | 3 | 1 | 84680 | 89,50 | 84710 | 107,67 |
| 5 | 0,80 | 4,00 | 6 | 64 | 2,40 | 25,00 | 3 | 1 | 84681 | 91,94 | 84711 | 109,96 |
| 6 | 1,00 | 4,50 | 6 | 64 | 3,00 | 20,00 | 3 | 1 | 84683 | 87,05 | 84712 | 105,38 |
| 6 | 1,00 | 4,50 | 6 | 70 | 3,00 | 24,00 | 3 | 1 | 84684 | 91,18 | 84713 | 108,59 |
| 6 | 1,00 | 4,50 | 6 | 70 | 3,00 | 30,00 | 3 | 1 | 84685 | 95,30 | 84714 | 111,79 |
| 8 | 1,25 | 6,00 | 6 | 64 | 3,80 | 24,00 | 4 | 1 | 84686 | 87,05 | 84715 | 105,38 |
| 8 | 1,25 | 6,00 | 6 | 78 | 3,80 | 32,00 | 4 | 1 | 84687 | 92,34 | 84716 | 109,81 |
| 8 | 1,25 | 6,00 | 6 | 78 | 3,80 | 40,00 | 4 | 1 | 84688 | 97,62 | 84717 | 114,24 |
| 10 | 1,50 | 7,50 | 8 | 78 | 4,50 | 33,00 | 4 | 1 | 84689 | 121,32 | 84718 | 146,31 |
| 10 | 1,50 | 7,50 | 8 | 89 | 4,50 | 40,00 | 4 | 1 | 84690 | 124,97 | 84719 | 155,33 |
| 10 | 1,50 | 7,50 | 8 | 89 | 4,50 | 50,00 | 4 | 1 | 84691 | 128,59 | 84720 | 164,33 |
| 12 | 1,75 | 9,50 | 10 | 89 | 5,30 | 38,00 | 4 | 1 | 84692 | 144,97 | 84726 | 169,40 |
| 12 | 1,75 | 9,50 | 10 | 110 | 5,30 | 48,00 | 4 | 1 | 84693 | 151,60 | 84727 | 176,04 |
| 12 | 1,75 | 9,50 | 10 | 110 | 5,30 | 60,00 | 4 | 1 | 84694 | 158,22 | 84728 | 182,66 |
| 16 | 2,00 | 12,00 | 12 | 100 | 6,00 | 50,00 | 4 | 1 | 84695 | 243,81 | 84729 | 267,94 |
| 16 | 2,00 | 12,00 | 12 | 130 | 6,00 | 64,00 | 4 | 1 | 84696 | 261,56 | 84730 | 286,55 |
| 16 | 2,00 | 12,00 | 12 | 130 | 6,00 | 80,00 | 4 | 1 | 84697 | 279,30 | 84731 | 305,14 |
| 20 | 2,50 | 16,00 | 16 | 102 | 7,10 | 50,00 | 4 | 1 | 84699 | 340,96 | 84732 | 409,38 |
| 24 | 3,00 | 18,00 | 18 | 102 | 8,60 | 50,00 | 4 | 1 | 84700 | 389,71 | 84733 | 455,00 |
| 30 | 3,50 | 20,00 | 20 | 120 | 10,50 | 60,00 | 4 | 1 | 84701 | 453,97 | 84734 | 535,39 |
| 36 | 4,00 | 20,00 | 20 | 120 | 11,00 | 60,00 | 4 | 1 | 84702 | 477,23 | 84735 | 569,03 |

## MÉTODO DE ROSCADO CON REF. 9330

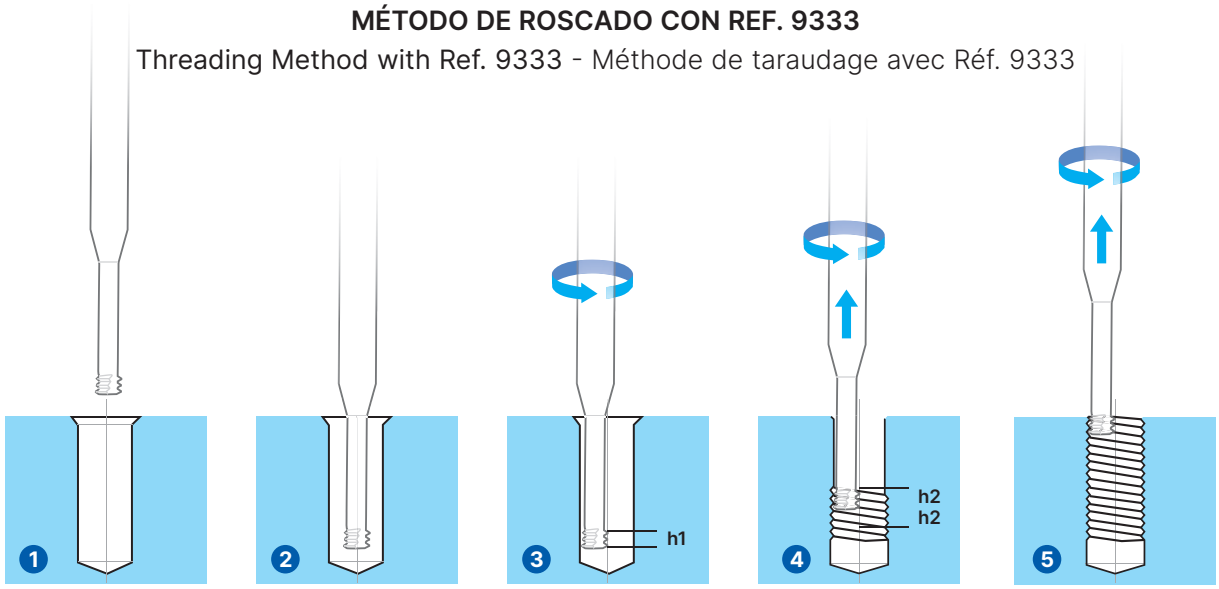
Threading Method with Ref. 9330 - Méthode de taraudage avec Réf. 9330




## MÉTODO DE ROSCADO CON REF. 9333

Threading Method with Ref. 9333 - Méthode de taraudage avec Réf. 9333




**Nota:**

**Valor h2:**

1. **Para mecanizado de uso general**

**h2 = 3 Pasos**

2. **Para mecanizado de materiales termorresistentes (S) o endurecidos (H)**

**h2 = 1 Paso**

Note:

Value h2:

1. For general-purpose machining

h2 = 3 Pitch

2. For machining heat-resistant (S) or hardened (H) materials

h2 = 1 Pitch

Note:

Valeur h2 :

1. Pour l'usinage général

h2 = 3 Pas

2. Pour l'usinage de matériaux résistants à la chaleur (S) ou durcis (H)

h2 = 1 Pas

# SETS FRESADO METAL DURO
## Carbide Milling Sets
## Jeux de fraisage carbure

**Set Price!**

**Benefíciate de un 5% de descuento extra en nuestros sets de Metal Duro**
**Get an extra 5% discount on our Carbide sets**
Bénéficiez d'une remise supplémentaire de 5 % sur nos jeux en carbure

## Set 9406

**FRESA METAL DURO HÉLICE ALTERNA ALTO RENDIMIENTO 48-70 HRC**

48-70 HRC High Performance Unequal Helix Carbide End Mill

Fraise carbure hélice alternée haut rendement 48-70 HRC

**6 Pcs**

| Cont. | N° Art. IKRA | € Set Price! |
|---|---|---|
| 4-5-6-8-10-12 mm | 67688 | 268,34 |

## Set 9401

**FRESA METAL DURO 4Z USO GENERAL**

4Z General Purpose Carbide End Mill

Fraise carbure 4Z utilisation générale

**6 Pcs**

| Cont. | N° Art. CROMAX | € Set Price! |
|---|---|---|
| 4-5-6-8-10-12 mm | 67685 | 183,37 |

## Set 9431

**FRESA METAL DURO SERIE CORTA 3Z USO GENERAL**

General Purpose 3Z Short Series Carbide End Mill

Fraise carbure série courte 3Z utilisation générale

**6 Pcs**

| Cont. | N° Art. CROMAX | € Set Price! |
|---|---|---|
| 4-5-6-8-10-12 mm | 67686 | 183,37 |

# Set 9421

**FRESA METAL DURO 2Z USO GENERAL**
General Purpose 2Z Carbide End Mill
Fraise carbure 2Z utilisation générale

6 Pcs

| Cont. | N° Art. CROMAX | € Set Price! |
|---|---|---|
| 4-5-6-8-10-12 mm | 67687 | 183,37 |

# Set 9416

**FRESA METAL DURO 1Z**
**PULIDO ESPEJO ALUMINIO/TERMOPLÁSTICOS**
Aluminium/Thermoplastics 1Z Mirror Polished Carbide End Mill
Fraise carbure 1Z polyglass Aluminium/Thermoplastiques

5 Pcs

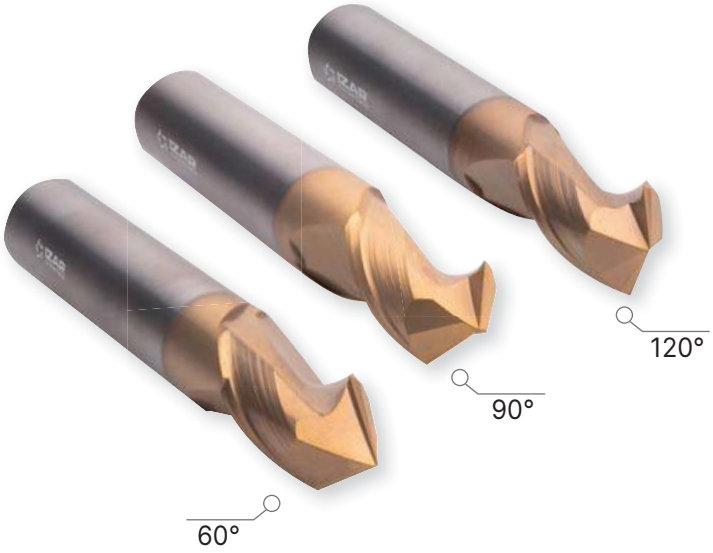
| Cont. | N° Art. MD/HM | € Set Price! |
|---|---|---|
| 3-4-5 6-8 mm | 78335 | 109,16 |

# Set 9450

**FRESA METAL DURO MULTIFUNCIÓN PUNTA V**

V-Point Multifunction Carbide End Mill

Fraise carbure multifonction-V



**3 Pcs**

| Cont. | N° Art. SUA | € |
|---|---|---|
| 6 mm 60°<br>6 mm 90°<br>6 mm 120° | 80509 | Set Price!<br>221,13 |

# Set 9459

**FRESA METAL DURO 1Z GRABADO**

1Z Engraving Carbide End Mill

Fraise carbure 1Z gravure

**4 Pcs**

| | Cont. Ø | N° Art. MD/HM | € |
|---|---|---|---|
| 1 | 0,1 mm 30°<br>0,2 mm 30°<br>0,4 mm 30°<br>0,8 mm 30° | 81958 | Set Price!<br>33,46 |

**4 Pcs**

| | Cont. Ø | N° Art. MD/HM | € |
|---|---|---|---|
| 2 | 0,1 mm 30°<br>0,1 mm 45°<br>0,1 mm 60°<br>0,1 mm 90° | 81959 | Set Price!<br>33,46 |

# 06.

# FRESADO PMX-HSSE-HSS

PMX-HSSE-HSS Milling

Fraisage PMX-HSSE-HSS

**FRESAS FRONTALES DESBASTE**
Roughing End Mills
Fraises Ébauche 388

**FRESAS FRONTALES ACABADO**
Finishing End Mills
Fraises finition 400

**JUEGOS FRESAS**
End Mill Sets
Jeux de fraises 423

**FRESAS ESPECIALES**
Shank Tools
Fraises spéciales 429

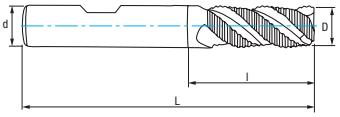
**FRESAS FRONTALES MANGO CÓNICO**
Taper Shank End Mills
Fraises queue conique 435

**FRESAS AGUJERO / FRESAS MADRE**
Milling Cutters / Gear Hobs
Fraises â trou 440

# Ref. 6644

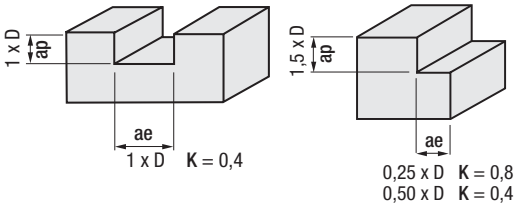
IZARMAX

## FRESA FRONTAL DESBASTE FINO PMX NZ
NZ PMX Fine Pitch Roughing End Mill
Fraise ébauche pas fin PMX NZ




PMX | PMX + TIALN-TOP | DIN 844 NR-F | 4-6 Z | 45° * | 30° | DIN 1835 B | Tol. D (k12) d (h6)

* **Con radio bajo demanda**
**With radius upon request**
Avec rayon sur demande




| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | PMX | TIALN-TOP |
| P | P.2 | 30-42 | 45-75 |
| | P.3 | 12-18 | 20-35 |
| | P.5 | 18-24 | 30-45 |
| S | | 18-24 | 30-45 |

**Refs. 6644-6696 - Avances fz/rev. (mm/z) - Feed - Pas**

| Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 |
|---|---|---|---|---|---|---|---|
| 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |
| 0,025 | 0,030 | 0,052 | 0,052 | 0,075 | 0,075 | 0,075 | 0,075 |
| 0,025 | 0,030 | 0,052 | 0,052 | 0,075 | 0,075 | 0,075 | 0,075 |
| 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 | 0,150 | 0,150 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

**Set**
**pag. 423**

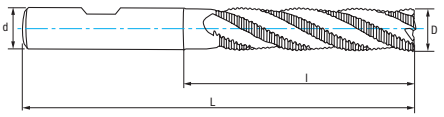
| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| 6,00 | 6 | 57 | 13 | 4 | 45201 | 39,72 | 45529 | 46,16 |
| 7,00 | 10 | 66 | 16 | 4 | 23132 | 50,00 | 23140 | 56,92 |
| 8,00 | 10 | 69 | 19 | 4 | 45204 | 43,31 | 45532 | 50,45 |
| 9,00 | 10 | 69 | 19 | 4 | 23133 | 51,86 | 23141 | 59,58 |
| 10,00 | 10 | 72 | 22 | 5 | 45207 | 40,99 | 45535 | 49,07 |
| 12,00 | 12 | 83 | 26 | 5 | 45209 | 54,17 | 45537 | 63,03 |
| 14,00 | 12 | 83 | 26 | 5 | 45210 | 65,34 | 45538 | 75,08 |
| 16,00 | 16 | 92 | 32 | 5 | 45211 | 80,87 | 45540 | 92,15 |

| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| 18,00 | 16 | 92 | 32 | 5 | 45213 | 88,01 | 45543 | 100,78 |
| 20,00 | 20 | 104 | 38 | 5 | 45216 | 111,23 | 45546 | 124,85 |
| 22,00 | 20 | 104 | 38 | 5 | 14815 | 135,72 | 14880 | 154,84 |
| 25,00 | 25 | 121 | 45 | 5 | 45219 | 164,73 | 45549 | 182,87 |
| 28,00 | 25 | 121 | 45 | 5 | 13223 | 180,75 | 12822 | 204,23 |
| 30,00 | 25 | 121 | 45 | 5 | 14817 | 219,30 | 14883 | 247,02 |
| 32,00 | 32 | 133 | 53 | 6 | 45717 | 240,51 | 45248 | 265,81 |

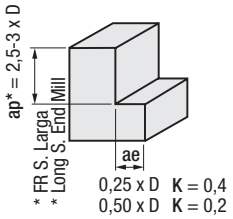
# Ref. 6696

IZARMAX

## FRESA FRONTAL DESBASTE FINO PMX NZ LARGA
Long NZ PMX Fine Pitch Roughing End Mill
Fraise ébauche pas fin PMX NZ longue




PMX | PMX + TIALN-TOP | DIN 844 NR-F | 4-6 Z | 45° | 30° | DIN 1835 B | Tol. D (k12) d (h6)



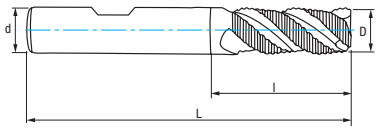

| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| 6,00 | 6 | 68 | 24 | 4 | 45239 | 63,98 | 45558 | 69,85 |
| 8,00 | 10 | 88 | 38 | 4 | 45240 | 66,21 | 45561 | 72,89 |
| 10,00 | 10 | 95 | 45 | 4 | 45241 | 58,07 | 45564 | 66,17 |
| 12,00 | 12 | 110 | 53 | 4 | 45242 | 74,36 | 45567 | 83,13 |
| 14,00 | 12 | 110 | 53 | 4 | 45243 | 85,93 | 45568 | 94,92 |

| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| 16,00 | 16 | 123 | 63 | 4 | 45244 | 104,41 | 45570 | 117,12 |
| 18,00 | 16 | 123 | 63 | 4 | 45245 | 117,71 | 45571 | 131,93 |
| 20,00 | 20 | 141 | 75 | 4 | 45246 | 153,59 | 45573 | 169,16 |
| 25,00 | 25 | 166 | 90 | 5 | 45247 | 236,26 | 45574 | 259,95 |
| 32,00 | 32 | 186 | 106 | 6 | 45249 | 339,98 | 45261 | 370,15 |

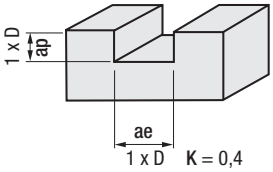
# Ref. 6647

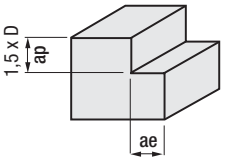
IZARMAX

## FRESA FRONTAL DESBASTE FINO PMX NZ INOX
Stainless NZ PMX Fine Pitch Roughing End Mill
Fraise ébauche pas fin PMX NZ inox




PMX | TIALN-TOP | DIN 844 NR-F | 4-5 Z | 45° | DIN 1835 B | Tol. D (k12) d (h6)




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | TIALN-TOP | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 |
| M | | 20-35 | 0,025 | 0,030 | 0,052 | 0,052 | 0,075 | 0,075 | 0,075 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

K = Coeficiente corrección
Correction coefficient
Coéficient correction

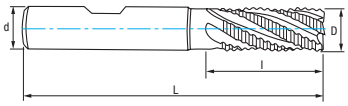
| D mm | d mm | L mm | l mm | Z | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|
| **6,00** | 6 | 57 | 13 | 4 | 29139 | **50,10** |
| **7,00** | 10 | 66 | 16 | 4 | 29140 | **61,91** |
| **8,00** | 10 | 69 | 19 | 4 | 29141 | **54,79** |
| **9,00** | 10 | 69 | 19 | 4 | 29142 | **64,77** |
| **10,00** | 10 | 72 | 22 | 4 | 29143 | **53,16** |
| **12,00** | 12 | 83 | 26 | 4 | 29144 | **68,44** |
| **14,00** | 12 | 83 | 26 | 4 | 29145 | **81,62** |
| **16,00** | 16 | 92 | 32 | 5 | 29146 | **100,25** |
| **18,00** | 16 | 92 | 32 | 5 | 29147 | **109,57** |
| **20,00** | 20 | 104 | 38 | 5 | 29148 | **135,96** |
| **22,00** | 20 | 104 | 38 | 5 | 29150 | **168,45** |
| **25,00** | 25 | 121 | 45 | 5 | 29152 | **199,34** |

Set
pag. 423

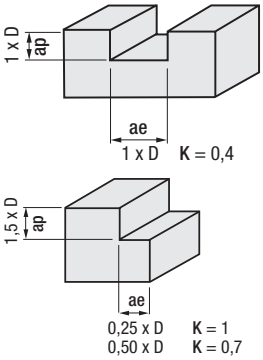
# Ref. 6640

IZARMAX

## FRESA FRONTAL DESBASTE GRUESO PMX NZ
NZ PMX Coarse Roughing End Mill
Fraise ébauche PMX NZ




PMX | PMX + TIALN-TOP | DIN 844 NR | 4-6 Z | 45° | 30° | DIN 1835 B | Tol. D (k12) d (h6)




| Material | | Vc (m/min) | | Refs. 6640-6690 - Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | PMX | TIALN-TOP | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 |
| P | P.1 | 35-45 | 55-80 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |
| N | N.1 | 70-120 | 110-210 | 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 | 0,150 | 0,150 |
| | N.2 | 70-120 | 110-210 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |
| | N.3 | 190-240 | 290-420 | 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 | 0,150 | 0,150 |
| | N.4 | 190-240 | 290-420 | 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 | 0,150 | 0,150 |
| | N.5 | 60-96 | 90-170 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

K = Coeficiente corrección
Correction coefficient
Coéficient correction

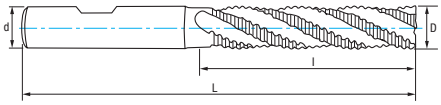
| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| 6,00 | 6 | 57 | 13 | 4 | 20903 | 36,08 | 21029 | 41,93 |
| 7,00 | 10 | 66 | 16 | 4 | 23138 | 45,44 | 23142 | 52,15 |
| 8,00 | 10 | 69 | 19 | 4 | 20904 | 39,37 | 21030 | 46,06 |
| 9,00 | 10 | 69 | 19 | 4 | 23139 | 47,15 | 23143 | 54,47 |
| 10,00 | 10 | 72 | 22 | 5 | 20905 | 37,27 | 21031 | 44,66 |
| 12,00 | 12 | 83 | 26 | 5 | 20907 | 49,23 | 21032 | 57,25 |
| 14,00 | 12 | 83 | 26 | 5 | 20908 | 59,40 | 21033 | 68,38 |
| 16,00 | 16 | 92 | 32 | 5 | 20909 | 73,52 | 21034 | 84,07 |

| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| 18,00 | 16 | 92 | 32 | 5 | 20912 | 80,02 | 21035 | 91,87 |
| 20,00 | 20 | 104 | 38 | 5 | 20915 | 101,14 | 21036 | 114,11 |
| 22,00 | 20 | 104 | 38 | 5 | 21078 | 123,40 | 21095 | 141,26 |
| 25,00 | 25 | 121 | 45 | 5 | 20917 | 149,79 | 21037 | 167,64 |
| 28,00 | 25 | 121 | 45 | 5 | 22117 | 164,51 | 22400 | 214,96 |
| 30,00 | 25 | 121 | 45 | 5 | 21083 | 199,34 | 21096 | 224,68 |
| 32,00 | 32 | 133 | 53 | 6 | 20922 | 218,61 | 21038 | 243,96 |

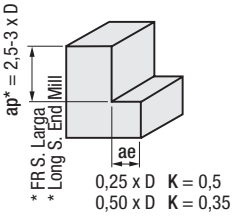
# Ref. 6690

IZARMAX

## FRESA FRONTAL DESBASTE GRUESO PMX NZ LARGA
Long NZ PMX Coarse Roughing End Mill
Fraise ébauche PMX NZ longue




PMX | PMX + TIALN-TOP | DIN 844 NR | 4-6 Z | 45° | 30° | DIN 1835 B | Tol. D (k12) d (h6)

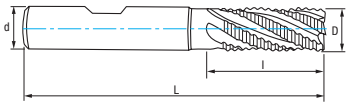



| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| 6,00 | 6 | 68 | 24 | 4 | 20568 | 57,60 | 20578 | 63,47 |
| 8,00 | 10 | 88 | 38 | 4 | 20569 | 59,58 | 20579 | 66,29 |
| 10,00 | 10 | 95 | 45 | 4 | 20570 | 52,25 | 20580 | 60,36 |
| 12,00 | 12 | 110 | 53 | 4 | 20571 | 66,90 | 20581 | 75,65 |
| 14,00 | 12 | 110 | 53 | 4 | 20572 | 77,33 | 20582 | 86,31 |

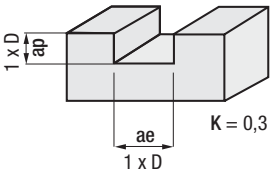
| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| 16,00 | 16 | 123 | 63 | 4 | 20573 | 94,00 | 20583 | 106,65 |
| 18,00 | 16 | 123 | 63 | 4 | 20574 | 105,95 | 20584 | 120,17 |
| 20,00 | 20 | 141 | 75 | 4 | 20575 | 138,24 | 20585 | 153,79 |
| 25,00 | 25 | 166 | 90 | 5 | 20576 | 212,66 | 20586 | 236,34 |
| 32,00 | 32 | 186 | 106 | 6 | 20577 | 305,99 | 20587 | 336,15 |

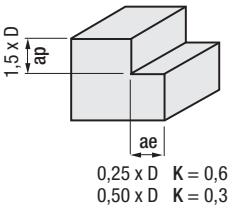
# Ref. 6642
IZARMAX

## FRESA FRONTAL DESBASTE MEDIO PMX NZ
NZ PMX Roughing & Finishing End Mill
Fraise semi-finition PMX NZ




PMX | PMX + TIALN-TOP | DIN 844 NF | 4-5 Z | 45° | 30° | DIN 1835 B | Tol. D (k12) d (h6)




| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | PMX | TIALN-TOP |
| P | P.1 | 35-45 | 55-80 |
| S | | 18-24 | 30-45 |
| N | N.1 | 70-120 | 110-210 |
| | N.2 | 60-100 | 90-190 |

| Refs. 6642-6692 - Avances fz/rev. (mm/z) - Feed - Pas | | | | | |
|---|---|---|---|---|---|
| Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 |
| 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 |
| 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 |
| 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

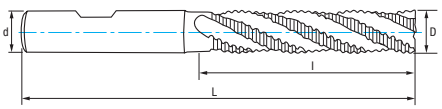
K = Coeficiente corrección / Correction coefficient / Coéficient correction

Vf (mm/min.) = r.p.m. x Z x fz x K

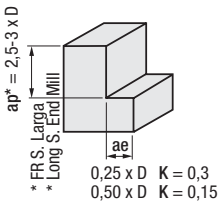
| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| **6,00** | 6 | 57 | 13 | 4 | 13231 | **34,86** | 13224 | **41,23** |
| **8,00** | 10 | 69 | 19 | 4 | 13233 | **43,72** | 13225 | **51,28** |
| **10,00** | 10 | 72 | 22 | 5 | 13235 | **34,05** | 13226 | **43,02** |
| **12,00** | 12 | 83 | 26 | 5 | 13236 | **45,30** | 13227 | **55,66** |
| **14,00** | 12 | 83 | 26 | 5 | 13237 | **51,65** | 13228 | **63,27** |
| **16,00** | 16 | 92 | 32 | 5 | 13242 | **60,73** | 13229 | **75,08** |
| **20,00** | 20 | 104 | 38 | 5 | 13245 | **89,22** | 13230 | **106,93** |

# Ref. 6692
IZARMAX

## FRESA FRONTAL DESBASTE MEDIO PMX NZ LARGA
Long NZ PMX Roughing & Finishing End Mill
Fraise Semi-Finition PMX NZ longue




PMX | PMX + TIALN-TOP | DIN 844 NF | 4 Z | 45° | 30° | DIN 1835 B | Tol. D (k12) d (h6)

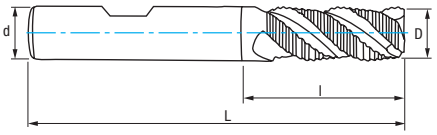



| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| **6,00** | 6 | 68 | 24 | 4 | 13263 | **51,20** | 13248 | **57,09** |
| **8,00** | 10 | 88 | 38 | 4 | 13266 | **58,97** | 13251 | **65,68** |
| **10,00** | 10 | 95 | 45 | 4 | 13269 | **55,17** | 13254 | **64,13** |
| **12,00** | 12 | 110 | 53 | 4 | 13272 | **75,20** | 13257 | **85,18** |
| **16,00** | 16 | 123 | 63 | 4 | 13275 | **103,40** | 13260 | **118,92** |
| **20,00** | 20 | 141 | 75 | 4 | 13278 | **142,95** | 13262 | **162,28** |

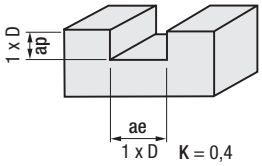
# Ref. 6444

IZARMAX

## FRESA FRONTAL DESBASTE FINO PMX 3Z
3Z PMX Fine Pitch Roughing End Mill
Fraise ébauche pas fin PMX 3Z




PMX | PMX + TIALN-TOP | DIN 844 NR-F | 45° | 30° | DIN 1835 B | Tol. D (k12) d (h6)




| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | PMX | TIALN-TOP |
| P | P.2 | 30-42 | 45-75 |
| | P.3 | 12-18 | 20-35 |
| | P.5 | 18-24 | 30-45 |

| Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|
| Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 30 |
| 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |
| 0,025 | 0,030 | 0,052 | 0,052 | 0,075 | 0,075 | 0,075 | 0,075 |
| 0,025 | 0,030 | 0,052 | 0,052 | 0,075 | 0,075 | 0,075 | 0,075 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| **4,00** | 6 | 55 | 11 | 3 | 20875 | **43,91** | 21017 | **51,05** |
| **5,00** | 6 | 57 | 13 | 3 | 20881 | **43,91** | 21018 | **51,05** |
| **6,00** | 6 | 57 | 13 | 3 | 20884 | **43,91** | 21019 | **51,05** |
| **8,00** | 10 | 69 | 19 | 3 | 20888 | **47,88** | 21020 | **55,81** |
| **10,00** | 10 | 72 | 22 | 3 | 20889 | **47,62** | 21021 | **54,25** |
| **12,00** | 12 | 83 | 26 | 3 | 20890 | **59,01** | 21022 | **67,47** |
| **14,00** | 12 | 83 | 26 | 3 | 20893 | **71,53** | 21023 | **81,04** |
| **16,00** | 16 | 92 | 32 | 3 | 20895 | **84,54** | 21024 | **95,69** |
| **18,00** | 16 | 92 | 32 | 3 | 20897 | **97,34** | 21025 | **111,43** |
| **20,00** | 20 | 104 | 38 | 3 | 20898 | **120,35** | 21026 | **134,10** |
| **25,00** | 25 | 121 | 45 | 3 | 20899 | **178,00** | 21027 | **196,89** |
| **28,00** | 25 | 121 | 45 | 3 | 11129 | **179,12** | 13195 | **214,98** |
| **30,00** | 25 | 121 | 45 | 3 | 20900 | **238,72** | 21028 | **265,50** |

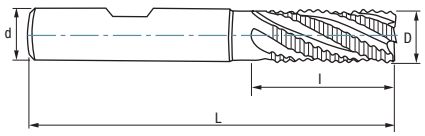
Ref. 6644

Ref. 4644

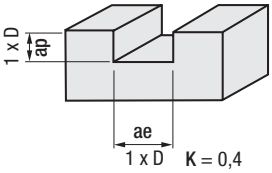
Ref. 4696

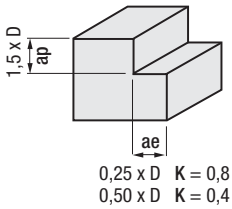
# Ref. 4644

## FRESA FRONTAL DESBASTE FINO HSSE 8% CO NZ
NZ HSSE 8% Co Fine Pitch Roughing End Mill
Fraise ébauche pas fin HSSE 8% Co NZ




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 844 NR-F | ISO 1641 | 3-5 Z | 30° | DIN 1835 B | Tol. D (k12) d (h6)




Set pag. 424

| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN |
| P | P.2 | 25-35 | 35-46 |
| K | K.1 | 20-30 | 25-45 |
| | K.2 | 15-20 | 20-25 |
| S | | 15-20 | 20-25 |
| N | N.1 | 60-100 | 80-140 |
| | N.2 | 60-100 | 80-140 |

| Refs. 4644-4696 - Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 30 |
| 0,014 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| 0,014 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| 0,025 | 0,042 | 0,062 | 0,067 | 0,080 | 0,110 | 0,130 | 0,130 | 0,130 |
| 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

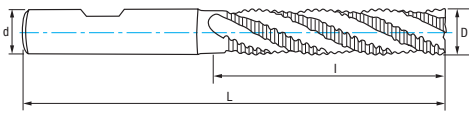
**K =** Coeficiente corrección / Correction coefficient / Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| 4,00 | 6 | 55 | 11 | 3 | 41857 | 40,07 | 41860 | 46,41 |
| 5,00 | 6 | 57 | 13 | 3 | 41803 | 43,18 | 41856 | 49,50 |
| 6,00 | 6 | 57 | 13 | 4 | 46517 | 35,07 | 41780 | 42,32 |
| 7,00 | 10 | 66 | 16 | 4 | 46520 | 42,24 | 41781 | 50,58 |
| 8,00 | 10 | 69 | 19 | 4 | 46523 | 36,58 | 41782 | 44,94 |
| 9,00 | 10 | 69 | 19 | 4 | 46526 | 43,85 | 41783 | 52,97 |
| 10,00 | 10 | 72 | 22 | 4 | 46529 | 36,66 | 41784 | 43,97 |
| 11,00 | 12 | 79 | 22 | 4 | 68800 | 53,60 | 41785 | 62,79 |
| 12,00 | 12 | 83 | 26 | 4 | 46532 | 43,86 | 41786 | 54,22 |
| 13,00 | 12 | 83 | 26 | 4 | 69564 | 62,29 | 41787 | 72,52 |

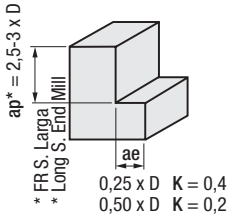
| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| 14,00 | 12 | 83 | 26 | 4 | 46535 | 51,29 | 41788 | 63,48 |
| 15,00 | 12 | 83 | 26 | 4 | 69540 | 67,45 | 41789 | 79,65 |
| 16,00 | 16 | 92 | 32 | 4 | 46538 | 60,56 | 41790 | 74,63 |
| 17,00 | 16 | 92 | 32 | 4 | 69541 | 83,12 | 41791 | 96,61 |
| 18,00 | 16 | 92 | 32 | 4 | 46541 | 66,33 | 41792 | 82,37 |
| 19,00 | 16 | 92 | 32 | 4 | 69552 | 97,51 | 41793 | 110,28 |
| 20,00 | 20 | 104 | 38 | 4 | 46544 | 83,15 | 41794 | 99,90 |
| 25,00 | 25 | 121 | 45 | 5 | 52347 | 122,88 | 41795 | 145,99 |
| 30,00 | 25 | 121 | 45 | 5 | 52362 | 157,84 | 41796 | 191,99 |

# Ref. 4696

## FRESA FRONTAL DESBASTE FINO HSSE 8% CO NZ LARGA
Long NZ HSSE 8% Co Fine Pitch Roughing End Mill
Fraise ébauche pas fin HSSE 8% Co NZ longue




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 844 NR-F | 4-5 Z | 30° | DIN 1835 B | Tol. D (k12) d (h6)



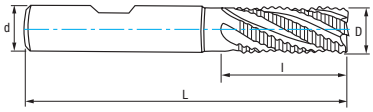

| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| 6,00 | 6 | 68 | 24 | 4 | 43263 | 49,76 | 18764 | 55,86 |
| 7,00 | 10 | 80 | 30 | 4 | 43264 | 56,43 | 18765 | 63,51 |
| 8,00 | 10 | 88 | 38 | 4 | 43266 | 51,46 | 18766 | 58,66 |
| 9,00 | 10 | 88 | 38 | 4 | 43269 | 56,43 | 18767 | 64,29 |
| 10,00 | 10 | 95 | 45 | 4 | 43272 | 45,13 | 18768 | 54,29 |
| 11,00 | 12 | 102 | 45 | 4 | 43273 | 73,28 | 18769 | 82,95 |
| 12,00 | 12 | 110 | 53 | 4 | 43275 | 55,56 | 18770 | 65,71 |

| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| 14,00 | 12 | 110 | 53 | 4 | 43276 | 64,22 | 17895 | 74,44 |
| 16,00 | 16 | 123 | 63 | 4 | 43278 | 75,15 | 17896 | 89,97 |
| 18,00 | 16 | 123 | 63 | 4 | 43281 | 88,79 | 18782 | 105,39 |
| 20,00 | 20 | 141 | 75 | 4 | 43282 | 106,59 | 18778 | 124,43 |
| 25,00 | 25 | 166 | 90 | 5 | 43287 | 164,00 | 18779 | 191,08 |
| 30,00 | 25 | 166 | 90 | 5 | 43289 | 249,04 | 18780 | 282,43 |

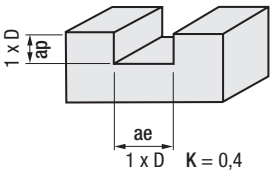
**TIALSIN bajo demanda / upon request** / sur demande

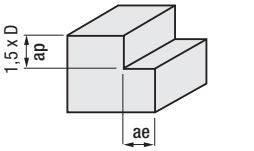
# Ref. 4640

## FRESA FRONTAL DESBASTE GRUESO HSSE 8% CO NZ
NZ HSSE 8% Co Coarse Roughing End Mill
Fraise ébauche HSSE 8% Co NZ




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 844 NR | ISO 1641 | ø≤25 | ø>25 | 4-6 Z | 30° | DIN 1835 B | Tol. D (k12) d (h6)




| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN |
| P | P.1 | 30-40 | 40-56 |
| K | K.1 | 20-30 | 25-45 |
| | K.2 | 15-20 | 20-25 |
| N | N.1 | 60-100 | 80-140 |
| | N.2 | 60-100 | 80-140 |

| Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 |
| 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

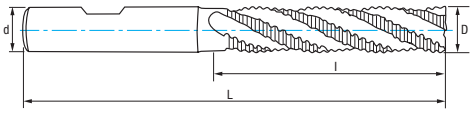
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

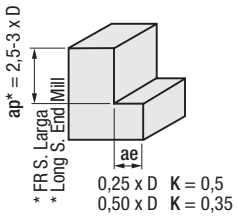
| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **4,00** | 6 | 55 | 11 | 3 | 45862 | **36,39** | 21813 | **42,78** |
| **5,00** | 6 | 57 | 13 | 3 | 45864 | **39,26** | 21814 | **45,57** |
| **6,00** | 6 | 57 | 13 | 4 | 46457 | **31,87** | 41756 | **38,49** |
| **7,00** | 10 | 66 | 16 | 4 | 77662 | **38,39** | 41757 | **45,96** |
| **8,00** | 10 | 69 | 19 | 4 | 46460 | **33,28** | 41758 | **40,97** |
| **9,00** | 10 | 69 | 19 | 4 | 77663 | **39,86** | 41759 | **48,16** |
| **10,00** | 10 | 72 | 22 | 4 | 46463 | **33,32** | 41760 | **40,62** |
| **11,00** | 12 | 79 | 22 | 4 | 77664 | **48,74** | 41761 | **58,04** |
| **12,00** | 12 | 83 | 26 | 4 | 46466 | **39,87** | 41762 | **49,43** |
| **13,00** | 12 | 83 | 26 | 4 | 77665 | **56,62** | 41763 | **67,02** |
| **14,00** | 12 | 83 | 26 | 4 | 46469 | **46,63** | 41764 | **57,36** |
| **15,00** | 12 | 83 | 26 | 4 | 77666 | **61,32** | 41765 | **73,68** |
| **16,00** | 16 | 92 | 32 | 4 | 46472 | **54,95** | 41766 | **67,56** |
| **17,00** | 16 | 92 | 32 | 4 | 77667 | **75,55** | 41767 | **89,28** |
| **18,00** | 16 | 92 | 32 | 4 | 46475 | **60,33** | 41768 | **74,44** |
| **19,00** | 16 | 92 | 32 | 4 | 77668 | **88,65** | 41769 | **103,52** |
| **20,00** | 20 | 104 | 38 | 4 | 46478 | **75,58** | 41770 | **90,83** |
| **22,00** | 20 | 104 | 38 | 5 | 46481 | **89,48** | 41771 | **110,80** |
| **24,00** | 25 | 121 | 45 | 5 | 77669 | **112,53** | 41772 | **130,40** |
| **25,00** | 25 | 121 | 45 | 5 | 46484 | **111,73** | 41773 | **129,58** |
| **Ø > 25 mm sin Corte al Centro (antigua 4440) / Non Center Cutting (old 4440) /** Sans coupe au centre (vieux 4440) | | | | | | | | |
| **26,00** | 25 | 121 | 45 | 5 | 77670 | **117,89** | 41774 | **148,08** |
| **28,00** | 25 | 121 | 45 | 5 | 46487 | **117,48** | 41775 | **147,67** |
| **30,00** | 25 | 121 | 45 | 5 | 46490 | **130,46** | 41776 | **160,25** |
| **32,00** | 32 | 133 | 53 | 6 | 46493 | **143,08** | 41777 | **172,50** |
| **36,00** | 32 | 133 | 53 | 6 | 77671 | **169,41** | 41778 | **201,72** |
| **40,00** | 40 | 155 | 63 | 6 | 77672 | **190,48** | 41779 | **232,36** |

# Ref. 4690

## FRESA FRONTAL DESBASTE GRUESO HSSE 8% CO NZ LARGA
Long NZ HSSE 8% Co Coarse Roughing End Mill
Fraise ébauche HSSE 8% Co NZ longue




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 844 NR | ISO 1641 | ø≤25 | ø>25 | 4-6 Z | 30° | Tol. D (k12) d (h6) | DIN 1835 B




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 |
| P | P.1 | 30-40 | 40-56 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| K | K.1 | 20-30 | 25-45 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | K.2 | 15-20 | 20-25 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.1 | 60-100 | 80-140 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.2 | 60-100 | 80-140 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

Vf (mm/min.) = r.p.m. x Z x fz x K

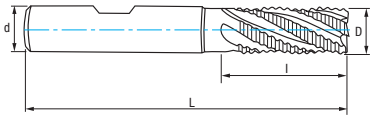
K = Coeficiente corrección / Correction coefficient / Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **6,00** | 6 | 68 | 24 | 4 | 77784 | **45,24** | 17883 | **51,47** |
| **7,00** | 10 | 80 | 30 | 4 | 77785 | **51,32** | 18157 | **58,52** |
| **8,00** | 10 | 88 | 38 | 4 | 77786 | **46,77** | 18159 | **54,11** |
| **9,00** | 10 | 88 | 38 | 4 | 77787 | **51,32** | 18160 | **59,30** |
| **10,00** | 10 | 95 | 45 | 4 | 46634 | **41,06** | 43084 | **50,28** |
| **11,00** | 12 | 102 | 45 | 4 | 77788 | **66,63** | 18162 | **76,47** |
| **12,00** | 12 | 110 | 53 | 4 | 46637 | **50,52** | 43086 | **60,80** |
| **14,00** | 12 | 110 | 53 | 4 | 46640 | **58,38** | 43087 | **68,78** |
| **16,00** | 16 | 123 | 63 | 4 | 46643 | **68,34** | 43089 | **83,33** |
| **18,00** | 16 | 123 | 63 | 4 | 46646 | **80,71** | 43090 | **97,52** |
| **20,00** | 20 | 141 | 75 | 4 | 46649 | **96,93** | 43092 | **115,03** |
| **22,00** | 20 | 141 | 75 | 5 | 46652 | **123,66** | 18163 | **148,97** |
| **25,00** | 25 | 166 | 90 | 5 | 46655 | **149,10** | 18165 | **176,57** |
| **Ø > 25 mm sin Corte al Centro**<br>**Non Center Cutting /** Sans coupe au centre | | | | | | | | |
| **28,00** | 25 | 166 | 90 | 5 | 46658 | **168,25** | 18168 | **204,28** |
| **30,00** | 25 | 166 | 90 | 5 | 79047 | **205,82** | 18174 | **240,43** |
| **32,00** | 32 | 186 | 106 | 6 | 46661 | **213,57** | 18180 | **248,45** |
| **36,00** | 32 | 186 | 106 | 6 | 79050 | **256,01** | 18183 | **293,73** |
| **40,00** | 40 | 217 | 125 | 6 | 79052 | **302,67** | 18184 | **363,04** |

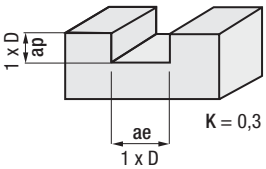
**TIALSIN bajo demanda / upon request** / sur demande

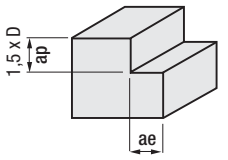
# Ref. 4680

## FRESA FRONTAL DESBASTE MEDIO HSSE 8% CO NZ
NZ HSSE 8% Co Roughing & Finishing End Mill
Fraise semi-finition HSSE 8% Co NZ




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 844 NF | ISO 1641 | ø≤25 | ø>25 | 30° | DIN 1835 B | Tol. D (k12) d (h6)




0,25 x D K = 0,6
0,50 x D K = 0,3

| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 |
| P | P.1 | 25-35 | 35-46 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| K | K.1 | 20-30 | 25-45 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | K.2 | 15-20 | 20-25 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.1 | 60-100 | 80-140 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.2 | 60-100 | 80-140 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

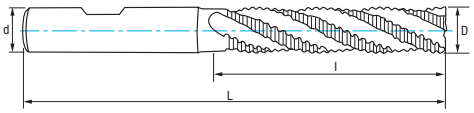
**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **6,00** | 6 | 57 | 13 | 4 | 77713 | **30,77** | 17714 | **37,44** |
| **7,00** | 10 | 66 | 16 | 4 | 77714 | **37,48** | 21867 | **45,08** |
| **8,00** | 10 | 69 | 19 | 4 | 77715 | **36,96** | 17715 | **44,58** |
| **9,00** | 10 | 69 | 19 | 4 | 77716 | **41,06** | 21868 | **49,35** |
| **10,00** | 10 | 72 | 22 | 4 | 46613 | **28,75** | 17716 | **37,37** |
| **11,00** | 12 | 79 | 22 | 4 | 77717 | **45,18** | 17717 | **54,58** |
| **12,00** | 12 | 83 | 26 | 4 | 46616 | **36,69** | 17718 | **46,35** |
| **13,00** | 12 | 83 | 26 | 4 | 77718 | **54,04** | 21869 | **64,54** |
| **14,00** | 12 | 83 | 26 | 4 | 40526 | **41,84** | 17947 | **52,65** |
| **15,00** | 12 | 83 | 26 | 4 | 77719 | **56,83** | 21870 | **69,33** |
| **16,00** | 16 | 92 | 32 | 4 | 46619 | **47,19** | 15099 | **59,99** |
| **18,00** | 16 | 92 | 32 | 4 | 40550 | **54,70** | 19300 | **68,95** |
| **20,00** | 20 | 104 | 38 | 4 | 46622 | **66,68** | 16611 | **82,17** |
| **22,00** | 20 | 104 | 38 | 5 | 78051 | **80,38** | 21831 | **101,94** |
| **25,00** | 25 | 121 | 45 | 5 | 46625 | **101,06** | 16612 | **122,10** |
| **Ø > 25 mm sin Corte al Centro**<br>**Non Center Cutting /** Sans coupe au centre | | | | | | | | |
| **28,00** | 25 | 121 | 45 | 5 | 78054 | **110,97** | 21900 | **141,70** |
| **30,00** | 25 | 121 | 45 | 5 | 78061 | **130,45** | 22192 | **160,63** |
| **32,00** | 32 | 133 | 53 | 6 | 78065 | **121,23** | 19532 | **151,68** |
| **36,00** | 32 | 133 | 53 | 6 | 78068 | **169,41** | 22193 | **202,18** |
| **40,00** | 40 | 155 | 63 | 6 | 78134 | **214,30** | 22194 | **256,03** |

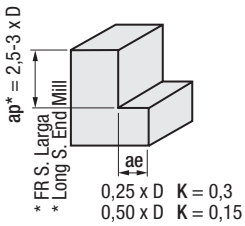
**TIALSIN bajo demanda / upon request** / sur demande

# Ref. 4692

## FRESA FRONTAL DESBASTE MEDIO HSSE 8% CO NZ LARGA
Long NZ HSSE 8% Co Roughing & Finishing End Mill
Fraise semi-finition HSSE 8% Co NZ longue




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 844 NF | ISO 1641 | ø≤25 | ø>25 | 30° | Tol. D (k12) d (h6) | DIN 1835 B




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 |
| P | P.1 | 25-35 | 35-46 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| K | K.1 | 20-30 | 25-45 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | K.2 | 15-20 | 20-25 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.1 | 60-100 | 80-140 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.2 | 60-100 | 80-140 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

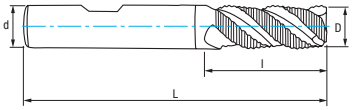
K = Coeficiente corrección / Correction coefficient / Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **6,00** | 6 | 68 | 24 | 4 | 77789 | **45,24** | 13074 | **51,47** |
| **7,00** | 10 | 80 | 30 | 4 | 77790 | **51,32** | 13076 | **58,52** |
| **8,00** | 10 | 88 | 38 | 4 | 77791 | **49,81** | 21816 | **57,05** |
| **9,00** | 10 | 88 | 38 | 4 | 77792 | **59,75** | 13077 | **67,53** |
| **10,00** | 10 | 95 | 45 | 4 | 52371 | **46,62** | 21483 | **55,69** |
| **11,00** | 12 | 102 | 45 | 4 | 77793 | **66,63** | 13080 | **76,47** |
| **12,00** | 12 | 110 | 53 | 4 | 52374 | **60,88** | 18901 | **70,89** |
| **14,00** | 12 | 110 | 53 | 4 | 52377 | **67,10** | 13082 | **77,25** |
| **16,00** | 16 | 123 | 63 | 4 | 52380 | **80,38** | 13083 | **95,03** |
| **18,00** | 16 | 123 | 63 | 4 | 52383 | **86,95** | 13085 | **103,54** |
| **20,00** | 20 | 141 | 75 | 4 | 52386 | **106,86** | 19515 | **124,68** |
| **22,00** | 20 | 141 | 75 | 5 | 52389 | **125,05** | 13086 | **150,16** |
| **25,00** | 25 | 166 | 90 | 5 | 52392 | **154,07** | 13087 | **181,41** |
| **Ø > 25 mm sin Corte al Centro** Non Center Cutting / Sans coupe au centre | | | | | | | | |
| **28,00** | 25 | 166 | 90 | 5 | 52395 | **163,39** | 13088 | **199,19** |
| **30,00** | 25 | 166 | 90 | 5 | 52398 | **182,98** | 13089 | **218,18** |
| **32,00** | 32 | 186 | 106 | 6 | 52401 | **198,03** | 13090 | **232,85** |
| **36,00** | 32 | 186 | 106 | 6 | 79086 | **256,01** | 13091 | **293,73** |
| **40,00** | 40 | 217 | 125 | 6 | 79087 | **308,71** | 16562 | **369,09** |

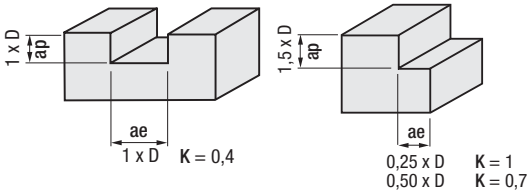
**TIALSIN bajo demanda / upon request** / sur demande

# Ref. 4447

## FRESA FRONTAL DESBASTE GRUESO HSSE 8% CO 3Z
3Z HSSE 8% Co Coarse Roughing End Mill
Fraise ébauche HSSE 8% Co 3Z




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 844 WR | ISO 1641/1 | 40° | DIN 1835 B | Tol. D (k12) d (h6)




| Material | | Vc (m/min) | | Refs. 4447-4497 - Avances fz/rev. (mm/z) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 30 |
| P | P.1 | 30-40 | 40-56 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.1 | 60-100 | 80-140 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.2 | 60-100 | 80-140 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.3 | 160-200 | 220-280 | 0,062 | 0,067 | 0,080 | 0,100 | 0,130 | 0,130 | 0,130 |
| | N.4 | 160-200 | 220-280 | 0,062 | 0,067 | 0,080 | 0,100 | 0,130 | 0,130 | 0,130 |
| | N.5 | 50-80 | 70-110 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

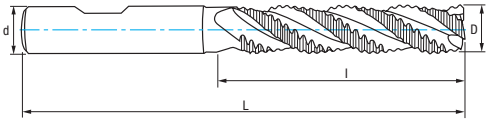
| | D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|---|
| New! | 6,00 | 6 | 57 | 13 | 3 | 44741 | 33,50 | 24366 | 39,35 |
| | 8,00 | 10 | 69 | 19 | 3 | 44744 | 36,54 | 17623 | 42,41 |
| | 9,00 | 10 | 69 | 19 | 3 | 78849 | 43,65 | 17624 | 50,97 |
| | 10,00 | 10 | 72 | 22 | 3 | 44747 | 36,57 | 17626 | 45,00 |
| | 11,00 | 12 | 79 | 22 | 3 | 78850 | 53,31 | 17174 | 61,31 |
| | 12,00 | 12 | 83 | 26 | 3 | 44750 | 43,88 | 17597 | 51,87 |
| | 13,00 | 12 | 83 | 26 | 3 | 78851 | 58,08 | 17175 | 67,07 |
| | 14,00 | 12 | 83 | 26 | 3 | 44753 | 50,14 | 17627 | 59,10 |

| | D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|---|
| | 15,00 | 12 | 83 | 26 | 3 | 78852 | 65,61 | 17176 | 76,13 |
| | 16,00 | 16 | 92 | 32 | 3 | 44756 | 60,78 | 17599 | 73,31 |
| | 18,00 | 16 | 92 | 32 | 3 | 44759 | 66,64 | 17600 | 81,21 |
| | 20,00 | 20 | 104 | 38 | 3 | 44762 | 82,11 | 17601 | 95,10 |
| New! | 22,00 | 20 | 104 | 38 | 3 | 44765 | 100,20 | 24367 | 117,98 |
| | 25,00 | 25 | 121 | 45 | 3 | 44768 | 122,82 | 17628 | 140,69 |
| | 30,00 | 25 | 121 | 45 | 3 | 40334 | 153,25 | 17629 | 180,38 |

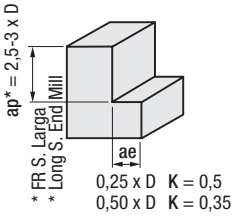
**TIALSIN bajo demanda / upon request** / sur demande

# Ref. 4497

## FRESA FRONTAL DESBASTE GRUESO HSSE 8% CO 3Z LARGA
Long 3Z HSSE 8% Co Coarse Roughing End Mill
Fraise ébauche HSSE 8% Co 3Z longue




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 844 WR | ISO 1641/1 | 40° | DIN 1835 B | Tol. D (k12) d (h6)




| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| 8,00 | 10 | 88 | 38 | 3 | 78862 | 43,42 | 17155 | 50,45 |
| 10,00 | 10 | 95 | 45 | 3 | 78863 | 45,11 | 20784 | 54,25 |
| 12,00 | 12 | 110 | 53 | 3 | 78864 | 50,20 | 43137 | 60,54 |
| 14,00 | 12 | 110 | 53 | 3 | 78865 | 54,78 | 19653 | 66,45 |
| 16,00 | 16 | 123 | 63 | 3 | 78866 | 62,11 | 17872 | 79,86 |

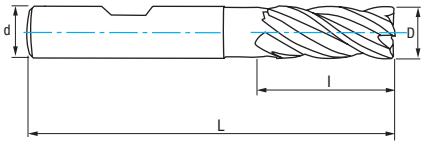
| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| 18,00 | 16 | 123 | 63 | 3 | 78867 | 74,02 | 21069 | 89,34 |
| 20,00 | 20 | 141 | 75 | 3 | 78868 | 83,16 | 21070 | 99,90 |
| 25,00 | 25 | 166 | 90 | 3 | 40338 | 123,00 | 21071 | 145,80 |
| 30,00 | 25 | 166 | 90 | 3 | 40342 | 157,84 | 21072 | 190,66 |

**TIALSIN bajo demanda / upon request** / sur demande

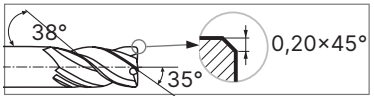
IZAR
CUTTING TOOLS
Continuous improvement in quality control
izartool.com/en
IZAR
CUTTING TOOLS

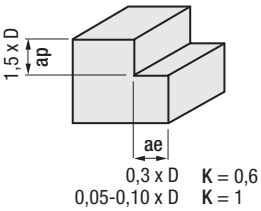
# Ref. 6666
HV

## FRESA FRONTAL PMX NZ HÉLICE ALTERNA
Unequal Helix NZ PMX End Mill
Fraise PMX NZ hélice alternée




PMX | TIALN-TOP | DIN 844 N | 4-6 Z | DIN 1835 B | Tol. D (k10) d (h6)




0,3 x D K = 0,6
0,05-0,10 x D K = 1

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | TIALN-TOP | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 |
| P | P.2 | 45-75 | 0,037 | 0,044 | 0,072 | 0,086 | 0,144 | 0,144 | 0,144 |
| | P.3 | 20-35 | 0,031 | 0,037 | 0,065 | 0,065 | 0,094 | 0,094 | 0,094 |
| | P.5 | 30-45 | 0,031 | 0,037 | 0,065 | 0,065 | 0,094 | 0,094 | 0,094 |
| M | | 20-35 | 0,031 | 0,037 | 0,065 | 0,065 | 0,094 | 0,094 | 0,094 |
| K | K.1 | 35-65 | 0,037 | 0,044 | 0,072 | 0,086 | 0,144 | 0,144 | 0,144 |
| | K.2 | 35-65 | 0,037 | 0,044 | 0,072 | 0,086 | 0,144 | 0,144 | 0,144 |
| S | | 30-45 | 0,052 | 0,077 | 0,096 | 0,115 | 0,159 | 0,187 | 0,187 |
| N | N.1 | 110-210 | 0,052 | 0,077 | 0,096 | 0,115 | 0,159 | 0,187 | 0,187 |
| | N.4 | 290-420 | 0,052 | 0,077 | 0,096 | 0,115 | 0,159 | 0,187 | 0,187 |
| | N.5 | 90-170 | 0,037 | 0,044 | 0,072 | 0,086 | 0,144 | 0,144 | 0,144 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|
| **6,00** | 6 | 57 | 13 | 4 | 28488 | **27,55** |
| **8,00** | 10 | 69 | 19 | 4 | 28489 | **35,56** |
| **10,00** | 10 | 72 | 22 | 4 | 28478 | **38,00** |
| **12,00** | 12 | 83 | 26 | 4 | 28479 | **47,97** |
| **16,00** | 16 | 92 | 32 | 5 | 28492 | **71,98** |
| **18,00** | 16 | 92 | 32 | 5 | 28494 | **86,79** |
| **20,00** | 20 | 104 | 38 | 5 | 28495 | **101,09** |
| **25,00** | 25 | 121 | 45 | 6 | 28484 | **167,83** |

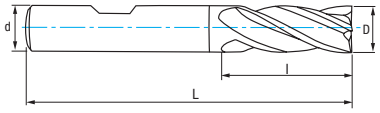
- **Acero Pulvimetalúrgico de gran rendimiento, elevada resistencia, tenacidad y homogeneidad**
- **Geometría con hélice alterna = Evita vibraciones y daños por desconchamiento en los filos de corte**
- **Reducción del ruido = Mecanizado suave y silencioso**
- **Mejora la calidad de la superficie mecanizada**
- **Mayor productividad = Aumento de hasta un 40% en los avances standard**
- **Menor desgaste + ausencia de vibraciones = Mayor vida útil de la herramienta**

- **High performance powder metal steel: high resistance, toughness and homogeneity**
- **Unequal helix geometry = Vibrations and cutting edge scaling caused damages avoided**
- **Noise reduction = Silent & soft machining**
- **Machined surface quality improved**
- **Higher productivity = Standard feed improved up to 40%**
- **Less wear + no vibrations = Longer tool life**

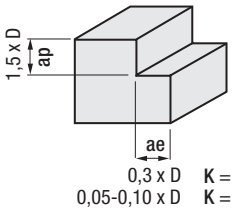
- Acier Fritté d´haute performance, grand rendement et résistance à l´usure.
- Géométrie Hélice Alternée = Pas de vibrations et pas de dommages sur les arêtes de coupe.
- Reduction du bruit = Usinage tendre et sans bruit
- Augmente la qualité de la surface usinée
- Meilleure Productivité = Augmentation d´un 40% sur les avances standards.
- Moins d´usure et manque de vibrations = Meilleure vie utile de l´outil

# Ref. 6600
IZARMAX

## FRESA FRONTAL ACABADO PMX NZ
NZ PMX Finishing End Mill
Fraise finition PMX NZ




PMX | PMX + TIALN-TOP | DIN 844 N | 4-6 Z | 30° | DIN 1835 B | Tol. D (k10) d (h6)




| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | PMX | TIALN-TOP |
| P | P.2 | 30-42 | 45-75 |
| | P.3 | 12-18 | 20-35 |
| | P.5 | 18-24 | 30-45 |
| M | | 16-22 | 20-35 |
| K | K.1 | 24-36 | 35-65 |
| | K.2 | 24-36 | 35-65 |
| S | | 18-24 | 30-45 |
| N | N.1 | 70-120 | 110-210 |
| | N.4 | 190-240 | 290-420 |
| | N.5 | 60-96 | 90-170 |

| Refs. 6600-6606 - Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|
| Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 |
| 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |
| 0,025 | 0,030 | 0,052 | 0,052 | 0,075 | 0,075 | 0,075 | 0,075 |
| 0,025 | 0,030 | 0,052 | 0,052 | 0,075 | 0,075 | 0,075 | 0,075 |
| 0,025 | 0,030 | 0,052 | 0,052 | 0,075 | 0,075 | 0,075 | 0,075 |
| 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |
| 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |
| 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 | 0,150 | 0,150 |
| 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 | 0,150 | 0,150 |
| 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 | 0,150 | 0,150 |
| 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

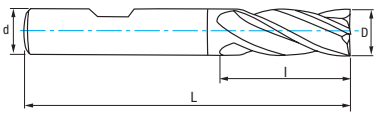
K = Coeficiente corrección / Correction coefficient / Coéficient correction

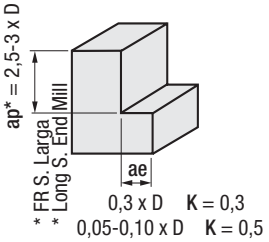
| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| 2,00 | 6 | 51 | 7 | 4 | 45718 | 16,06 | 45932 | 22,21 |
| 3,00 | 6 | 52 | 8 | 4 | 45166 | 16,06 | 45481 | 22,21 |
| 4,00 | 6 | 55 | 11 | 4 | 45168 | 16,06 | 45482 | 22,21 |
| 5,00 | 6 | 57 | 13 | 4 | 45169 | 16,06 | 45483 | 22,21 |
| 6,00 | 6 | 57 | 13 | 4 | 45171 | 16,06 | 45933 | 22,21 |
| 7,00 | 10 | 66 | 16 | 4 | 45174 | 21,64 | 45496 | 29,34 |
| 8,00 | 10 | 69 | 19 | 4 | 45177 | 21,50 | 45510 | 28,38 |
| 9,00 | 10 | 69 | 19 | 4 | 23134 | 25,66 | 23147 | 32,97 |
| 10,00 | 10 | 72 | 22 | 4 | 45180 | 22,90 | 45522 | 30,35 |

| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| 12,00 | 12 | 83 | 26 | 4 | 45183 | 29,44 | 45523 | 38,11 |
| 14,00 | 12 | 83 | 26 | 4 | 45186 | 39,85 | 45525 | 48,81 |
| 16,00 | 16 | 92 | 32 | 4 | 45189 | 46,01 | 45526 | 56,55 |
| 18,00 | 16 | 92 | 32 | 4 | 45192 | 56,16 | 45528 | 67,99 |
| 20,00 | 20 | 104 | 38 | 4 | 45195 | 66,00 | 45531 | 78,98 |
| 25,00 | 25 | 121 | 45 | 6 | 45198 | 112,29 | 45534 | 130,14 |
| 28,00 | 25 | 121 | 45 | 6 | 11135 | 134,29 | 13221 | 174,81 |
| 30,00 | 25 | 121 | 45 | 6 | 14826 | 156,85 | 14895 | 182,21 |
| 32,00 | 32 | 133 | 53 | 6 | 45720 | 165,07 | 45222 | 190,42 |

# Ref. 6606
IZARMAX

## FRESA FRONTAL ACABADO PMX NZ LARGA
Long NZ PMX Finishing End Mill
Fraise finition PMX NZ longue




PMX | PMX + TIALN-TOP | DIN 844 N | 4-6 Z | 30° | DIN 1835 B | Tol. D (k10) d (h6)

| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| 6,00 | 6 | 68 | 24 | 4 | 45225 | 19,57 | 45541 | 26,01 |
| 8,00 | 10 | 88 | 38 | 4 | 45228 | 28,24 | 45544 | 34,25 |
| 10,00 | 10 | 95 | 45 | 4 | 45231 | 28,16 | 45547 | 37,00 |
| 12,00 | 12 | 110 | 53 | 4 | 45233 | 38,54 | 45550 | 48,17 |
| 14,00 | 12 | 110 | 53 | 4 | 45234 | 50,41 | 45553 | 55,69 |

| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| 16,00 | 16 | 123 | 63 | 4 | 45235 | 55,13 | 45555 | 69,07 |
| 18,00 | 16 | 123 | 63 | 4 | 45236 | 69,81 | 45559 | 85,02 |
| 20,00 | 20 | 141 | 75 | 4 | 45237 | 81,74 | 45562 | 98,13 |
| 25,00 | 25 | 166 | 90 | 6 | 45238 | 150,33 | 45565 | 174,01 |
| 32,00 | 32 | 186 | 106 | 6 | 45724 | 210,01 | 45726 | 240,18 |

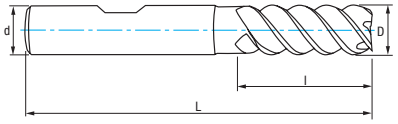
# Ref. 6604

IZARMAX

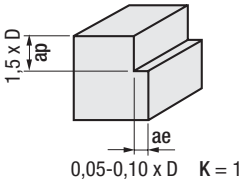
## FRESA FRONTAL SUPER-ACABADO PMX 4Z

4Z PMX Super-Finishing End Mill

Fraise super-finition PMX 4Z




PMX | PMX + TIALN-TOP | DIN 844 N | 4 Z | 55° | DIN 1835 B | Tol. D (k10) d (h6)




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | PMX | TIALN-TOP | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.1 | 35-45 | 55-80 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 |
| | P.2 | 30-42 | 45-75 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 |
| S | | 18-24 | 30-45 | 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 |
| N | N.1 | 70-120 | 110-210 | 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 |
| | N.2 | 70-120 | 110-210 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

$$Vf\ (mm/min.) = r.p.m. \times Z \times fz \times K$$

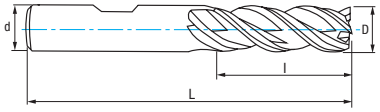
**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| **6,00** | 6 | 57 | 13 | 4 | 45384 | **22,98** | 45479 | **29,66** |
| **8,00** | 10 | 69 | 19 | 4 | 45385 | **29,94** | 45480 | **37,45** |
| **10,00** | 10 | 72 | 22 | 4 | 45387 | **33,38** | 45276 | **41,54** |
| **12,00** | 12 | 83 | 26 | 4 | 45388 | **45,78** | 45345 | **54,58** |
| **14,00** | 12 | 83 | 26 | 4 | 45390 | **58,16** | 45396 | **67,70** |
| **16,00** | 16 | 92 | 32 | 4 | 45391 | **67,42** | 45484 | **78,64** |
| **18,00** | 16 | 92 | 32 | 4 | 45393 | **82,95** | 45495 | **95,21** |
| **20,00** | 20 | 104 | 38 | 4 | 45394 | **97,19** | 45509 | **110,27** |

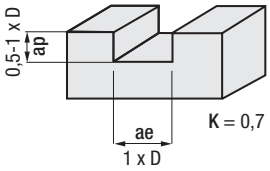
# Ref. 6430

IZARMAX

## FRESA FRONTAL ACABADO PMX 3Z ALUMINIO
Aluminium 3Z PMX Finishing End Mill
Fraise finition PMX 3Z aluminium




PMX | PMX + TIALN-TOP | DIN 844 W | | | | DIN 1835 B | Tol. D (e8) d (h6)




| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | PMX | TIALN-TOP |
| M | | 16-22 | 20-35 |
| S | | 18-24 | 30-45 |
| N | N.1 | 70-120 | 110-210 |
| | N.2 | 70-120 | 110-210 |
| | N.3 | 190-240 | 290-420 |
| | N.4 | 190-240 | 290-420 |
| | N.5 | 60-96 | 90-170 |

| Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 28 |
| 0,012 | 0,025 | 0,030 | 0,052 | 0,052 | 0,075 | 0,075 | 0,075 | 0,075 |
| 0,025 | 0,042 | 0,060 | 0,077 | 0,092 | 0,127 | 0,150 | 0,150 | 0,150 |
| 0,025 | 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,127 | 0,150 | 0,150 |
| 0,020 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |
| 0,025 | 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 | 0,150 | 0,150 |
| 0,025 | 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 | 0,150 | 0,150 |
| 0,020 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |

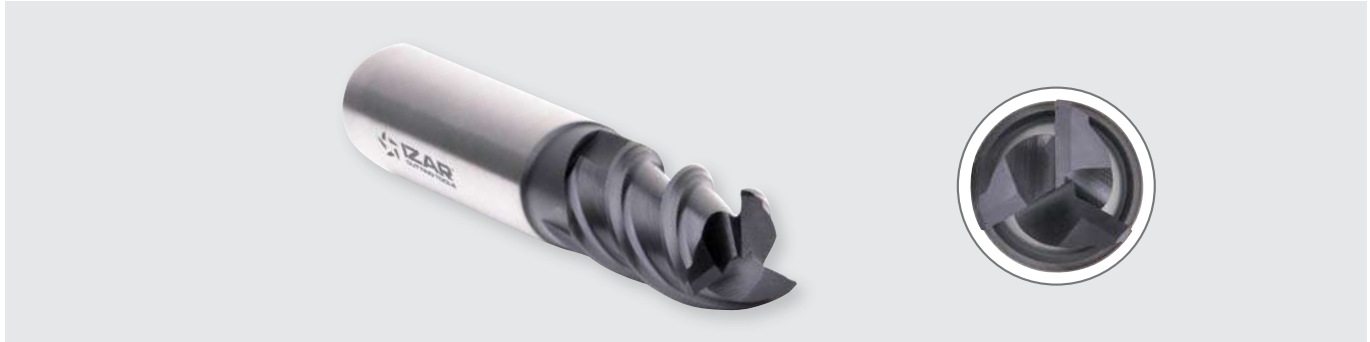
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| **4,00** | 6 | 55 | 11 | 3 | 45277 | **17,76** | 45415 | **24,18** |
| **5,00** | 6 | 57 | 13 | 3 | 45279 | **17,76** | 45417 | **24,18** |
| **6,00** | 6 | 57 | 13 | 3 | 45280 | **17,76** | 45420 | **24,18** |
| **7,00** | 10 | 66 | 16 | 3 | 45312 | **23,81** | 45423 | **30,50** |
| **8,00** | 10 | 69 | 19 | 3 | 45333 | **23,81** | 45426 | **30,50** |
| **9,00** | 10 | 69 | 19 | 3 | 23136 | **28,13** | 23146 | **35,52** |
| **10,00** | 10 | 72 | 22 | 3 | 45336 | **25,28** | 45429 | **32,61** |
| **12,00** | 12 | 83 | 26 | 3 | 45339 | **32,39** | 45432 | **40,40** |
| **14,00** | 12 | 83 | 26 | 3 | 45340 | **43,83** | 45438 | **52,80** |
| **16,00** | 16 | 92 | 32 | 3 | 45342 | **50,63** | 45441 | **61,61** |
| **18,00** | 16 | 92 | 32 | 3 | 45343 | **61,75** | 45444 | **73,59** |
| **20,00** | 20 | 104 | 38 | 3 | 45344 | **72,59** | 45447 | **85,58** |
| **25,00** | 25 | 121 | 45 | 3 | 11124 | **123,53** | 13159 | **152,71** |
| **28,00** | 25 | 121 | 45 | 3 | 11126 | **147,69** | 13177 | **185,60** |

**Set**
pag. 425



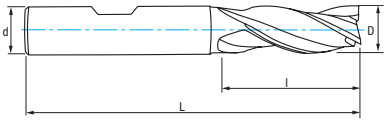
# Ref. 6439

IZARMAX

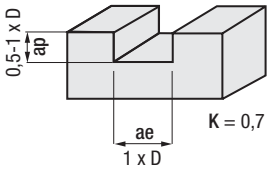
## FRESA FRONTAL ACABADO PMX 3Z

3Z PMX Finishing End Mill

Fraise finition PMX 3Z




PMX | PMX + TIALN-TOP | DIN 844 N | | | 30° | DIN 1835 B | Tol. D (e8) d (h6)




| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | PMX | TIALN-TOP |
| P | P.2 | 30-42 | 45-75 |
| | P.3 | 12-18 | 20-35 |
| | P.5 | 18-24 | 30-45 |

| Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 28 |
| 0,014 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |
| 0,012 | 0,025 | 0,030 | 0,052 | 0,052 | 0,075 | 0,075 | 0,075 | 0,075 |
| 0,012 | 0,025 | 0,030 | 0,052 | 0,052 | 0,075 | 0,075 | 0,075 | 0,075 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

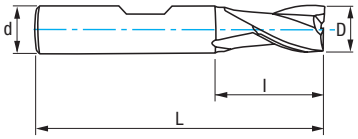
**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| **2,00** | 6 | 51 | 7 | 3 | 45721 | **16,14** | 45723 | **23,42** |
| **3,00** | 6 | 52 | 8 | 3 | 45262 | **16,14** | 45453 | **23,42** |
| **4,00** | 6 | 55 | 11 | 3 | 45263 | **16,14** | 45456 | **23,42** |
| **5,00** | 6 | 57 | 13 | 3 | 45264 | **16,14** | 45459 | **23,42** |
| **6,00** | 6 | 57 | 13 | 3 | 45265 | **16,14** | 45462 | **23,42** |
| **7,00** | 10 | 66 | 16 | 3 | 45266 | **21,64** | 45463 | **29,99** |
| **8,00** | 10 | 69 | 19 | 3 | 45267 | **21,64** | 45465 | **29,99** |
| **9,00** | 10 | 69 | 19 | 3 | 23137 | **25,55** | 23145 | **34,98** |
| **10,00** | 10 | 72 | 22 | 3 | 45268 | **22,98** | 45468 | **32,41** |
| **12,00** | 12 | 83 | 26 | 3 | 45269 | **29,44** | 45469 | **39,75** |
| **14,00** | 12 | 83 | 26 | 3 | 45270 | **39,85** | 45471 | **51,83** |
| **16,00** | 16 | 92 | 32 | 3 | 45271 | **46,01** | 45474 | **59,61** |
| **18,00** | 16 | 92 | 32 | 3 | 45272 | **56,16** | 45475 | **71,68** |
| **20,00** | 20 | 104 | 38 | 3 | 45273 | **66,00** | 45477 | **82,79** |
| **25,00** | 25 | 121 | 45 | 3 | 45274 | **112,29** | 45478 | **135,66** |
| **28,00** | 25 | 121 | 45 | 3 | 11128 | **134,29** | 13192 | **176,03** |

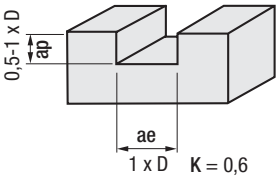
# Ref. 6420

IZARMAX

## FRESA FRONTAL ACABADO PMX 2Z
2Z PMX Finishing End Mill
Fraise finition PMX 2Z




PMX | PMX + TIALN-TOP | DIN 327 N | | | 30° | DIN 1835 B | Tol. D (e8) d (h6)




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | PMX | TIALN-TOP | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 28 |
| P | P.1 | 35-45 | 55-80 | 0,020 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |
| | P.2 | 30-42 | 45-75 | 0,014 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |
| | P.3 | 12-18 | 20-35 | 0,012 | 0,025 | 0,030 | 0,052 | 0,052 | 0,075 | 0,075 | 0,075 | 0,075 |
| | P.5 | 18-24 | 30-45 | 0,012 | 0,025 | 0,030 | 0,052 | 0,052 | 0,075 | 0,075 | 0,075 | 0,075 |
| K | K.1 | 24-36 | 35-65 | 0,020 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |
| | K.2 | 24-36 | 35-65 | 0,020 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |
| M | | 16-22 | 20-35 | 0,012 | 0,025 | 0,030 | 0,052 | 0,052 | 0,075 | 0,075 | 0,075 | 0,075 |
| S | | 18-24 | 30-45 | 0,025 | 0,042 | 0,060 | 0,077 | 0,092 | 0,127 | 0,150 | 0,150 | 0,150 |
| N | N.1 | 70-120 | 110-210 | 0,025 | 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,127 | 0,150 | 0,150 |
| | N.2 | 70-120 | 110-210 | 0,020 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |
| | N.3 | 190-240 | 290-420 | 0,025 | 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 | 0,150 | 0,150 |
| | N.4 | 190-240 | 290-420 | 0,025 | 0,042 | 0,062 | 0,077 | 0,092 | 0,127 | 0,150 | 0,150 | 0,150 |
| | N.5 | 60-96 | 90-170 | 0,020 | 0,030 | 0,035 | 0,058 | 0,069 | 0,115 | 0,115 | 0,115 | 0,115 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

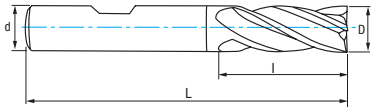
**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|---|
| **4,00** | 6 | 51 | 7 | 2 | 45250 | **14,74** | 45400 | **21,22** |
| **5,00** | 6 | 52 | 8 | 2 | 45251 | **14,74** | 45401 | **21,22** |
| **6,00** | 6 | 52 | 8 | 2 | 45252 | **14,74** | 45402 | **21,22** |
| **7,00** | 10 | 60 | 10 | 2 | 45253 | **22,23** | 45403 | **29,38** |
| **8,00** | 10 | 61 | 11 | 2 | 45254 | **19,22** | 45404 | **26,55** |
| **9,00** | 10 | 61 | 11 | 2 | 23135 | **23,80** | 23144 | **31,63** |
| **10,00** | 10 | 63 | 13 | 2 | 45255 | **21,41** | 45405 | **29,37** |
| **12,00** | 12 | 73 | 16 | 2 | 45256 | **27,24** | 45406 | **38,03** |
| **14,00** | 12 | 73 | 16 | 2 | 45257 | **37,34** | 45408 | **46,93** |
| **16,00** | 16 | 79 | 19 | 2 | 45258 | **43,28** | 45409 | **55,54** |
| **18,00** | 16 | 79 | 19 | 2 | 45259 | **53,24** | 45410 | **65,68** |
| **20,00** | 20 | 88 | 22 | 2 | 45260 | **62,39** | 45411 | **75,77** |
| **25,00** | 25 | 102 | 26 | 2 | 11119 | **106,67** | 13147 | **133,13** |
| **28,00** | 25 | 102 | 26 | 2 | 11120 | **134,96** | 13156 | **173,30** |

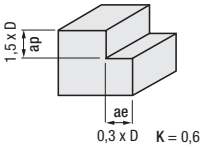
Set
pag. 425

# Ref. 4600

## FRESA FRONTAL ACABADO HSSE 8% CO NZ
NZ HSSE 8% Co Finishing End Mill
Fraise finition HSSE 8% Co NZ




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 844 N | ISO 1641 | ø≤25 | ø>25 | 4-6 Z | 30° | DIN 1835 B | Tol. D (k10) d (h6)




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | ø 4 | ø 6 | ø 8 | ø 10 | ø 12 | ø 16 | ø 20 | ø 25 | ø 32 | ø 40 |
| P | P.1 | 25-35 | 35-46 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| K | K.1 | 20-30 | 25-45 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | K.2 | 15-20 | 20-25 | 0,014 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.1 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.2 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

**Set**
**pag. 426**

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

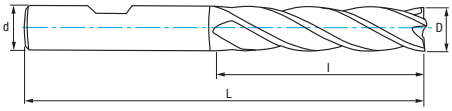
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

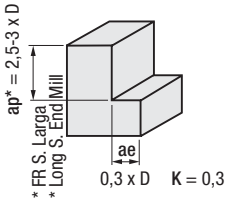
| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **2,00** | 6 | 51 | 7 | 4 | 46277 | **12,44** | 41718 | **19,60** |
| **2,50** | 6 | 52 | 8 | 4 | 46280 | **12,44** | 41719 | **19,60** |
| **3,00** | 6 | 52 | 8 | 4 | 46283 | **12,44** | 41721 | **19,60** |
| **3,50** | 6 | 54 | 10 | 4 | 46286 | **12,84** | 41722 | **19,98** |
| **4,00** | 6 | 55 | 11 | 4 | 46289 | **12,44** | 41724 | **19,60** |
| **4,50** | 6 | 55 | 11 | 4 | 46292 | **13,70** | 41725 | **20,86** |
| **5,00** | 6 | 57 | 13 | 4 | 46295 | **12,44** | 41727 | **19,60** |
| **5,50** | 6 | 57 | 13 | 4 | 46298 | **19,94** | 41728 | **26,87** |
| **6,00** | 6 | 57 | 13 | 4 | 46301 | **13,06** | 41730 | **20,21** |
| **6,50** | 10 | 66 | 16 | 4 | 46304 | **19,94** | 41731 | **28,02** |
| **7,00** | 10 | 66 | 16 | 4 | 46307 | **18,26** | 41732 | **26,37** |
| **7,50** | 10 | 66 | 16 | 4 | 46310 | **23,54** | 41733 | **31,53** |
| **8,00** | 10 | 69 | 19 | 4 | 46313 | **16,30** | 41734 | **24,50** |
| **8,50** | 10 | 69 | 19 | 4 | 46316 | **24,57** | 41735 | **33,31** |
| **9,00** | 10 | 69 | 19 | 4 | 46319 | **20,41** | 41736 | **29,26** |
| **9,50** | 10 | 69 | 19 | 4 | 46322 | **25,99** | 41737 | **34,68** |
| **10,00** | 10 | 72 | 22 | 4 | 46325 | **17,67** | 41738 | **26,60** |
| **11,00** | 12 | 79 | 22 | 4 | 46331 | **24,62** | 41740 | **34,57** |
| **12,00** | 12 | 83 | 26 | 4 | 46334 | **22,19** | 41741 | **30,68** |
| **13,00** | 12 | 83 | 26 | 4 | 46337 | **31,68** | 41742 | **42,80** |
| **14,00** | 12 | 83 | 26 | 4 | 46340 | **30,47** | 41743 | **41,62** |
| **15,00** | 12 | 83 | 26 | 4 | 46343 | **34,12** | 41744 | **47,27** |
| **16,00** | 16 | 92 | 32 | 4 | 46346 | **33,32** | 41745 | **46,45** |
| **17,00** | 16 | 92 | 32 | 4 | 46349 | **41,00** | 41746 | **55,66** |
| **18,00** | 16 | 92 | 32 | 4 | 46352 | **41,80** | 41747 | **56,44** |
| **19,00** | 16 | 92 | 32 | 4 | 46355 | **48,02** | 41748 | **64,04** |
| **20,00** | 20 | 104 | 38 | 4 | 46358 | **48,02** | 41749 | **64,04** |
| **22,00** | 20 | 104 | 38 | 6 | 46361 | **66,68** | 41750 | **88,64** |
| **24,00** | 25 | 121 | 45 | 6 | 77694 | **82,83** | 41751 | **104,35** |
| **25,00** | 25 | 121 | 45 | 6 | 46364 | **82,83** | 41752 | **104,35** |
| **Ø > 25 mm sin Corte al Centro (antigua 4400) /** Non Center Cutting (old 4400) / Sans coupe au centre (vieux 4400) | | | | | | | | |
| **26,00** | 25 | 121 | 45 | 6 | 78872 | **95,04** | 41753 | **126,23** |
| **28,00** | 25 | 121 | 45 | 6 | 46367 | **95,04** | 41754 | **126,23** |
| **30,00** | 25 | 121 | 45 | 6 | 46370 | **109,95** | 41755 | **140,73** |
| **32,00** | 32 | 133 | 53 | 6 | 46373 | **113,28** | 41947 | **143,94** |
| **36,00** | 32 | 133 | 53 | 6 | 46376 | **148,25** | 41948 | **181,63** |
| **40,00** | 40 | 155 | 63 | 8 | 46379 | **178,19** | 41949 | **220,94** |

# Ref. 4606

## FRESA FRONTAL ACABADO HSSE 8% CO NZ LARGA
Long NZ HSSE 8% Co Finishing End Mill
Fraise finition HSSE 8% Co NZ longue




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 844 N | ISO 1641 | ø≤25 | ø>25 | 30° | DIN 1835 B | Tol. D (k10) d (h6)




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 |
| P | P.1 | 25-35 | 35-46 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| K | K.1 | 20-30 | 25-45 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | K.2 | 15-20 | 20-25 | 0,014 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.1 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.2 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

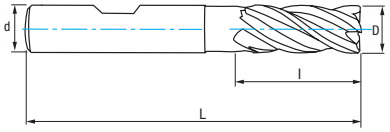
**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **2,00** | 6 | 54 | 10 | 4 | 46382 | **15,23** | 17889 | **22,28** |
| **2,50** | 6 | 56 | 12 | 4 | 46385 | **15,23** | 18144 | **22,28** |
| **3,00** | 6 | 56 | 12 | 4 | 46388 | **15,23** | 17890 | **22,28** |
| **3,50** | 6 | 59 | 15 | 4 | 77781 | **20,02** | 18145 | **26,98** |
| **4,00** | 6 | 63 | 19 | 4 | 46391 | **15,23** | 17651 | **22,28** |
| **4,50** | 6 | 63 | 19 | 4 | 77782 | **20,02** | 18147 | **26,98** |
| **5,00** | 6 | 68 | 24 | 4 | 46394 | **15,23** | 17891 | **22,28** |
| **5,50** | 6 | 68 | 24 | 4 | 77783 | **20,02** | 18148 | **26,98** |
| **6,00** | 6 | 68 | 24 | 4 | 46397 | **15,23** | 18149 | **22,28** |
| **7,00** | 10 | 80 | 30 | 4 | 46400 | **23,12** | 17892 | **31,11** |
| **8,00** | 10 | 88 | 38 | 4 | 46403 | **21,13** | 18150 | **28,05** |
| **9,00** | 10 | 88 | 38 | 4 | 46406 | **23,89** | 17894 | **32,63** |
| **10,00** | 10 | 95 | 45 | 4 | 46409 | **21,05** | 17260 | **30,85** |
| **11,00** | 12 | 102 | 45 | 4 | 46412 | **29,90** | 18151 | **40,76** |
| **12,00** | 12 | 110 | 53 | 4 | 46415 | **27,74** | 15399 | **38,68** |
| **14,00** | 12 | 110 | 53 | 4 | 46418 | **36,27** | 18152 | **47,27** |
| **16,00** | 16 | 123 | 63 | 4 | 46421 | **39,67** | 15624 | **55,46** |
| **18,00** | 16 | 123 | 63 | 4 | 46424 | **48,44** | 18153 | **66,10** |
| **20,00** | 20 | 141 | 75 | 4 | 46427 | **56,74** | 17219 | **76,00** |
| **22,00** | 20 | 141 | 75 | 6 | 46430 | **78,71** | 17171 | **100,12** |
| **25,00** | 25 | 166 | 90 | 6 | 46433 | **104,34** | 18154 | **128,03** |
| **Ø > 25 mm sin Corte al Centro**<br>**Non Center Cutting /** Sans coupe au centre | | | | | | | | |
| **28,00** | 25 | 166 | 90 | 6 | 46436 | **115,95** | 17189 | **153,03** |
| **30,00** | 25 | 166 | 90 | 6 | 46439 | **131,41** | 17191 | **168,03** |
| **32,00** | 32 | 186 | 106 | 6 | 46442 | **132,50** | 18155 | **169,13** |
| **36,00** | 32 | 186 | 106 | 6 | 46445 | **188,98** | 17396 | **228,59** |
| **40,00** | 40 | 217 | 125 | 8 | 46448 | **210,11** | 18156 | **271,39** |

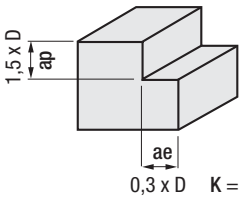
**TIALSIN bajo demanda / upon request** / sur demande

# Ref. 4400

## FRESA FRONTAL ACABADO HSSE 8% CO NZ
NZ HSSE 8% Co Finishing End Mill
Fraise finition HSSE 8% Co NZ




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 844 N | ISO 1641 | 30° | DIN 1835 B | Tol. D (k10) d (h6)




**No válida Trabajo Axial**
**Not Valid for Axial Work**
Invalide pour travail dans l´axe

| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 |
| P | P.1 | 25-35 | 35-46 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| K | K.1 | 20-30 | 25-45 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | K.2 | 15-20 | 20-25 | 0,014 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.1 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.2 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

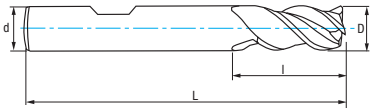
**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **2,00** | 6 | 51 | 7 | 4 | 43778 | **12,44** | 17528 | **19,60** |
| **2,50** | 6 | 52 | 8 | 4 | 43781 | **12,44** | 17529 | **19,60** |
| **3,00** | 6 | 52 | 8 | 4 | 43784 | **12,44** | 17530 | **19,60** |
| **3,50** | 6 | 54 | 10 | 4 | 43787 | **12,84** | 17531 | **19,98** |
| **4,00** | 6 | 55 | 11 | 4 | 43790 | **12,44** | 17533 | **19,60** |
| **4,50** | 6 | 55 | 11 | 4 | 43793 | **13,70** | 17590 | **20,86** |
| **5,00** | 6 | 57 | 13 | 4 | 43796 | **12,44** | 17536 | **19,60** |
| **5,50** | 6 | 57 | 13 | 4 | 43799 | **19,94** | 17537 | **26,87** |
| **6,00** | 6 | 57 | 13 | 4 | 43802 | **13,06** | 43903 | **20,21** |
| **6,50** | 10 | 66 | 16 | 4 | 43805 | **19,94** | 17538 | **28,02** |
| **7,00** | 10 | 66 | 16 | 4 | 43808 | **18,26** | 17539 | **26,37** |
| **7,50** | 10 | 66 | 16 | 4 | 43811 | **23,54** | 17540 | **31,53** |
| **8,00** | 10 | 69 | 19 | 4 | 43814 | **16,30** | 43904 | **24,50** |
| **8,50** | 10 | 69 | 19 | 4 | 43817 | **24,57** | 17542 | **33,31** |
| **9,00** | 10 | 69 | 19 | 4 | 43820 | **20,41** | 17543 | **29,26** |
| **9,50** | 10 | 69 | 19 | 4 | 43823 | **25,99** | 17544 | **34,68** |
| **10,00** | 10 | 72 | 22 | 4 | 43826 | **17,67** | 43905 | **26,60** |
| **11,00** | 12 | 79 | 22 | 4 | 43829 | **24,62** | 17545 | **34,57** |
| **12,00** | 12 | 83 | 26 | 4 | 43832 | **22,19** | 43906 | **30,68** |
| **13,00** | 12 | 83 | 26 | 4 | 43835 | **31,68** | 17546 | **42,80** |
| **14,00** | 12 | 83 | 26 | 4 | 43838 | **30,47** | 43907 | **41,62** |
| **15,00** | 12 | 83 | 26 | 4 | 43841 | **34,12** | 17548 | **47,27** |
| **16,00** | 16 | 92 | 32 | 4 | 43844 | **33,32** | 43908 | **46,45** |
| **17,00** | 16 | 92 | 32 | 4 | 43847 | **41,00** | 17549 | **55,66** |
| **18,00** | 16 | 92 | 32 | 4 | 43850 | **41,80** | 43909 | **56,44** |
| **19,00** | 16 | 92 | 32 | 4 | 43853 | **48,02** | 17551 | **64,04** |
| **20,00** | 20 | 104 | 38 | 4 | 43856 | **48,02** | 43910 | **64,04** |
| **22,00** | 20 | 104 | 38 | 6 | 43859 | **66,68** | 17552 | **88,64** |
| **24,00** | 25 | 121 | 42 | 6 | 43862 | **82,83** | 17553 | **104,35** |
| **25,00** | 25 | 121 | 42 | 6 | 43865 | **82,83** | 17554 | **104,35** |

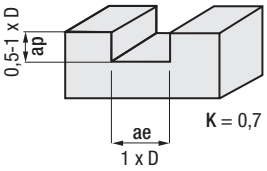
**TIALSIN bajo demanda**
**upon request** / sur demande

# Ref. 4430

## FRESA FRONTAL ACABADO HSSE 8% CO 3Z ALUMINIO
Aluminium 3Z HSSE 8% Co Finishing End Mill
Fraise finition HSSE 8% Co 3Z aluminium




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 844 W | ISO 1641 | 45° | DIN 1835 B | Tol. D (e8) d (h6)




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 |
| P | P.1 | 30-40 | 40-56 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.3 | 160-200 | 220-280 | 0,025 | 0,042 | 0,062 | 0,067 | 0,080 | 0,100 | 0,130 | 0,130 | 0,130 |
| | N.4 | 160-200 | 220-280 | 0,025 | 0,042 | 0,062 | 0,067 | 0,080 | 0,100 | 0,130 | 0,130 | 0,130 |
| | N.5 | 50-80 | 70-110 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

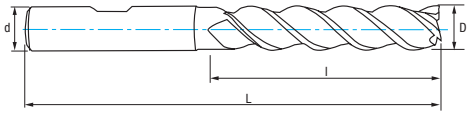
$$Vf\ (mm/min.) = \text{r.p.m.} \times Z \times fz \times K$$

K = Coeficiente corrección
Correction coefficient
Coéficient correction

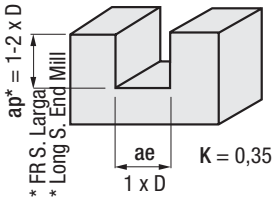
| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| 2,00 | 6 | 51 | 7 | 3 | 44477 | 13,69 | 41665 | 21,09 |
| 2,50 | 6 | 52 | 8 | 3 | 44480 | 13,69 | 41667 | 21,09 |
| 3,00 | 6 | 52 | 8 | 3 | 44483 | 13,34 | 41668 | 20,58 |
| 3,50 | 6 | 55 | 11 | 3 | 44486 | 14,11 | 41670 | 21,96 |
| 4,00 | 6 | 55 | 11 | 3 | 44489 | 13,69 | 41671 | 21,34 |
| 4,50 | 6 | 57 | 11 | 3 | 44492 | 15,08 | 41673 | 22,94 |
| 5,00 | 6 | 57 | 13 | 3 | 44495 | 13,69 | 41676 | 21,57 |
| 5,50 | 6 | 57 | 13 | 3 | 44498 | 17,94 | 41677 | 24,98 |
| 6,00 | 6 | 57 | 13 | 3 | 44501 | 14,81 | 41679 | 22,23 |
| 6,50 | 10 | 66 | 16 | 3 | 77449 | 21,92 | 41682 | 30,82 |
| 7,00 | 10 | 66 | 16 | 3 | 44504 | 20,09 | 41683 | 28,99 |
| 7,50 | 10 | 66 | 16 | 3 | 77450 | 23,42 | 41685 | 31,29 |
| 8,00 | 10 | 69 | 19 | 3 | 44507 | 18,06 | 41686 | 26,96 |
| 8,50 | 10 | 69 | 19 | 3 | 77451 | 24,68 | 41688 | 33,32 |
| 9,00 | 10 | 69 | 19 | 3 | 44510 | 22,45 | 41691 | 32,20 |
| 9,50 | 10 | 69 | 19 | 3 | 77452 | 26,73 | 41692 | 35,23 |
| 10,00 | 10 | 72 | 22 | 3 | 44513 | 19,46 | 41694 | 29,26 |
| 11,00 | 12 | 79 | 22 | 3 | 44516 | 27,10 | 41697 | 38,04 |
| 12,00 | 12 | 83 | 26 | 3 | 44519 | 24,41 | 41698 | 33,74 |
| 13,00 | 12 | 83 | 26 | 3 | 44522 | 34,83 | 41700 | 47,07 |
| 14,00 | 12 | 83 | 26 | 3 | 44525 | 34,32 | 41701 | 45,77 |
| 15,00 | 12 | 83 | 26 | 3 | 44528 | 37,54 | 41703 | 51,36 |
| 16,00 | 16 | 92 | 32 | 3 | 44531 | 36,66 | 41704 | 51,12 |
| 17,00 | 16 | 92 | 32 | 3 | 67508 | 50,93 | 41706 | 63,38 |
| 18,00 | 16 | 92 | 32 | 3 | 44534 | 45,98 | 41707 | 62,10 |
| 19,00 | 16 | 92 | 32 | 3 | 68886 | 61,68 | 41709 | 75,00 |
| 20,00 | 20 | 104 | 38 | 3 | 44537 | 52,81 | 41710 | 70,44 |
| 22,00 | 20 | 104 | 38 | 3 | 44540 | 73,36 | 41712 | 97,51 |
| 25,00 | 25 | 121 | 45 | 3 | 44543 | 95,36 | 41713 | 114,79 |
| 28,00 | 25 | 121 | 45 | 3 | 77824 | 113,87 | 41715 | 147,91 |
| 30,00 | 25 | 121 | 45 | 3 | 44546 | 131,80 | 41716 | 165,30 |
| 32,00 | 32 | 133 | 53 | 3 | 77827 | 138,76 | 41946 | 169,16 |

# Ref. 4432

## FRESA FRONTAL ACABADO HSSE 8% CO 3Z ALUMINIO LARGA
Long Aluminium 3Z HSSE 8% Co Finishing End Mill
Fraise finition HSSE 8% Co 3Z aluminium longue




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 844 W | ISO 1641 | 45° | DIN 1835 B | Tol. D (e8) d (h6)




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 |
| P | P.1 | 30-40 | 40-56 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.3 | 160-200 | 220-280 | 0,025 | 0,042 | 0,062 | 0,067 | 0,080 | 0,100 | 0,130 | 0,130 | 0,130 |
| | N.4 | 160-200 | 220-280 | 0,025 | 0,042 | 0,062 | 0,067 | 0,080 | 0,100 | 0,130 | 0,130 | 0,130 |
| | N.5 | 50-80 | 70-110 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

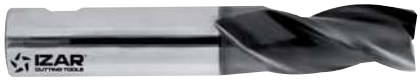
**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

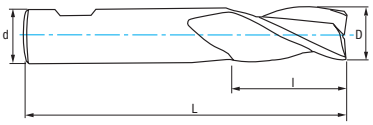
| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **2,00** | 6 | 54 | 10 | 3 | 77453 | **16,73** | 18084 | **24,52** |
| **2,50** | 6 | 56 | 12 | 3 | 77454 | **17,08** | 18087 | **24,52** |
| **3,00** | 6 | 56 | 12 | 3 | 77455 | **16,73** | 18088 | **24,52** |
| **3,50** | 6 | 59 | 15 | 3 | 77456 | **18,79** | 18090 | **26,18** |
| **4,00** | 6 | 63 | 19 | 3 | 77457 | **16,73** | 18093 | **24,52** |
| **4,50** | 6 | 63 | 19 | 3 | 77458 | **18,79** | 17380 | **26,18** |
| **5,00** | 6 | 68 | 24 | 3 | 77459 | **16,73** | 18097 | **24,52** |
| **5,50** | 6 | 68 | 24 | 3 | 77460 | **18,79** | 18099 | **26,18** |
| **6,00** | 6 | 68 | 24 | 3 | 44549 | **18,87** | 15049 | **25,55** |
| **7,00** | 10 | 80 | 30 | 3 | 77461 | **25,43** | 18100 | **34,21** |
| **8,00** | 10 | 88 | 38 | 3 | 44552 | **23,25** | 15050 | **30,87** |
| **9,00** | 10 | 88 | 38 | 3 | 77462 | **28,33** | 18102 | **36,58** |
| **10,00** | 10 | 95 | 45 | 3 | 44555 | **23,39** | 15051 | **33,93** |
| **11,00** | 12 | 102 | 45 | 3 | 77463 | **35,92** | 18103 | **46,19** |
| **12,00** | 12 | 110 | 53 | 3 | 44558 | **29,95** | 15052 | **41,49** |
| **14,00** | 12 | 110 | 53 | 3 | 44561 | **39,05** | 18105 | **50,65** |
| **16,00** | 16 | 123 | 63 | 3 | 44564 | **43,64** | 15046 | **61,00** |
| **18,00** | 16 | 123 | 63 | 3 | 44567 | **53,27** | 18106 | **72,36** |
| **20,00** | 20 | 141 | 75 | 3 | 44570 | **62,40** | 15047 | **82,78** |
| **22,00** | 20 | 141 | 75 | 3 | 44573 | **78,83** | 18108 | **106,89** |
| **25,00** | 25 | 166 | 90 | 3 | 44576 | **114,78** | 18109 | **140,83** |
| **28,00** | 25 | 166 | 90 | 3 | 80326 | **127,56** | 18112 | **168,32** |
| **30,00** | 25 | 166 | 90 | 3 | 44579 | **142,55** | 15048 | **181,22** |
| **32,00** | 32 | 186 | 106 | 3 | 77464 | **168,33** | 18114 | **202,40** |

**TIALSIN bajo demanda / upon request** / sur demande

# Ref. 4439

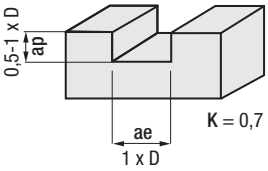
## FRESA FRONTAL ACABADO HSSE 8% CO 3Z
3Z HSSE 8% Co Finishing End Mill
Fraise finition HSSE 8% Co 3Z






HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 844 N | | |

| DIN 1835 B | Tol. D (e8) d (h6)




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.1 | 30-40 | 40-56 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 |
| K | K.1 | 20-30 | 25-45 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 |
| | K.2 | 15-20 | 20-25 | 0,014 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 |
| S | | 15-20 | 30-45 | 0,025 | 0,042 | 0,062 | 0,067 | 0,080 | 0,110 | 0,130 |
| N | N.1 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 |
| | N.2 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

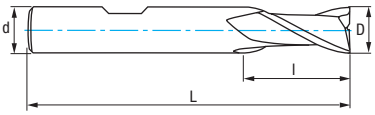
**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **2,00** | 6 | 51 | 7 | 3 | 43147 | **12,44** | 17602 | **19,60** |
| **2,50** | 6 | 52 | 8 | 3 | 43148 | **12,44** | 17603 | **19,60** |
| **3,00** | 6 | 52 | 8 | 3 | 43149 | **12,44** | 17604 | **19,60** |
| **3,50** | 6 | 54 | 10 | 3 | 43150 | **12,84** | 17605 | **19,98** |
| **4,00** | 6 | 55 | 11 | 3 | 43152 | **12,44** | 17606 | **19,60** |
| **4,50** | 6 | 57 | 11 | 3 | 43153 | **13,70** | 17607 | **20,86** |
| **5,00** | 6 | 57 | 13 | 3 | 43154 | **12,44** | 17221 | **19,67** |
| **5,50** | 6 | 57 | 13 | 3 | 43155 | **19,94** | 17608 | **26,87** |
| **6,00** | 6 | 57 | 13 | 3 | 43156 | **13,06** | 17222 | **22,06** |
| **6,50** | 10 | 66 | 16 | 3 | 75763 | **19,91** | 77230 | **28,04** |
| **7,00** | 10 | 66 | 16 | 3 | 43158 | **18,26** | 17224 | **26,37** |
| **7,50** | 10 | 66 | 16 | 3 | 75765 | **21,28** | 77231 | **29,49** |
| **8,00** | 10 | 69 | 19 | 3 | 43160 | **16,30** | 17612 | **24,50** |
| **8,50** | 10 | 69 | 19 | 3 | 75768 | **22,42** | 77232 | **31,28** |
| **9,00** | 10 | 69 | 19 | 3 | 43162 | **20,41** | 17225 | **29,26** |
| **9,50** | 10 | 72 | 19 | 3 | 75769 | **24,28** | 77233 | **33,23** |
| **10,00** | 10 | 72 | 22 | 3 | 43165 | **17,67** | 17616 | **26,60** |
| **12,00** | 12 | 83 | 26 | 3 | 43168 | **22,19** | 17617 | **31,58** |
| **14,00** | 12 | 83 | 26 | 3 | 43170 | **30,47** | 17618 | **41,62** |
| **16,00** | 16 | 92 | 32 | 3 | 43172 | **33,32** | 17620 | **46,45** |
| **18,00** | 16 | 92 | 32 | 3 | 43174 | **41,80** | 17621 | **56,44** |
| **20,00** | 20 | 104 | 38 | 3 | 43176 | **48,02** | 17622 | **64,04** |

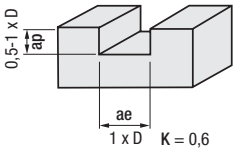
**TIALSIN bajo demanda / upon request** / sur demande

# Ref. 4420

## FRESA FRONTAL ACABADO HSSE 8% CO 2Z
2Z HSSE 8% Co Finishing End Mill
Fraise finition HSSE 8% Co 2Z




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 327 N | ISO 1641/1 | 30° | DIN 1835 B | Tol. D (e8) d (h6)



**Set** pag. 426

| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 |
| P | P.1 | 30-40 | 40-56 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| K | K.1 | 20-30 | 25-45 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | K.2 | 15-20 | 20-25 | 0,014 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.1 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.2 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.3 | 160-200 | 220-280 | 0,025 | 0,042 | 0,062 | 0,067 | 0,080 | 0,100 | 0,130 | 0,130 | 0,130 | 0,130 |
| | N.4 | 160-200 | 220-280 | 0,025 | 0,042 | 0,062 | 0,067 | 0,080 | 0,100 | 0,130 | 0,130 | 0,130 | 0,130 |
| | N.5 | 50-80 | 70-110 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

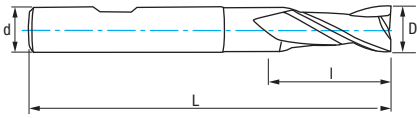
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

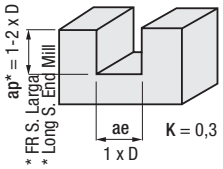
| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **1,00** | 6 | 48 | 3 | 2 | 77335 | **12,71** | 77336 | **19,88** |
| **1,50** | 6 | 48 | 3 | 2 | 77334 | **12,95** | 77337 | **20,13** |
| **2,00** | 6 | 48 | 4 | 2 | 44249 | **11,35** | 41613 | **18,53** |
| **2,50** | 6 | 49 | 5 | 2 | 44252 | **11,35** | 41614 | **18,53** |
| **3,00** | 6 | 49 | 5 | 2 | 44255 | **11,35** | 41616 | **18,53** |
| **3,50** | 6 | 50 | 6 | 2 | 44258 | **12,35** | 41617 | **19,51** |
| **4,00** | 6 | 51 | 7 | 2 | 44261 | **11,35** | 41619 | **18,53** |
| **4,50** | 6 | 52 | 8 | 2 | 44264 | **13,59** | 41620 | **20,72** |
| **5,00** | 6 | 52 | 8 | 2 | 44267 | **11,35** | 41622 | **18,53** |
| **5,50** | 6 | 52 | 8 | 2 | 44270 | **13,98** | 41623 | **21,08** |
| **6,00** | 6 | 52 | 8 | 2 | 44273 | **11,35** | 41625 | **18,53** |
| **6,50** | 10 | 60 | 10 | 2 | 44276 | **18,27** | 41626 | **26,40** |
| **7,00** | 10 | 60 | 10 | 2 | 44279 | **17,75** | 41628 | **25,86** |
| **7,50** | 10 | 61 | 11 | 2 | 44282 | **17,59** | 41629 | **25,72** |
| **8,00** | 10 | 61 | 11 | 2 | 44285 | **14,62** | 41631 | **22,85** |
| **8,50** | 10 | 61 | 11 | 2 | 44288 | **19,76** | 41634 | **28,61** |
| **9,00** | 10 | 61 | 11 | 2 | 44291 | **18,17** | 41635 | **27,05** |
| **9,50** | 10 | 61 | 11 | 2 | 44294 | **19,31** | 41637 | **28,19** |
| **10,00** | 10 | 63 | 13 | 2 | 44297 | **14,52** | 41638 | **23,54** |
| **11,00** | 12 | 70 | 13 | 2 | 44303 | **22,19** | 41641 | **32,21** |
| **12,00** | 12 | 73 | 16 | 2 | 44306 | **19,46** | 41643 | **29,59** |
| **13,00** | 12 | 73 | 16 | 2 | 44309 | **28,59** | 41644 | **39,79** |
| **14,00** | 12 | 73 | 16 | 2 | 44312 | **28,59** | 41646 | **39,79** |
| **15,00** | 12 | 73 | 16 | 2 | 44315 | **31,98** | 41647 | **45,16** |
| **16,00** | 16 | 79 | 19 | 2 | 44318 | **28,13** | 41649 | **41,42** |
| **17,00** | 16 | 79 | 19 | 2 | 44321 | **38,06** | 41650 | **52,79** |
| **18,00** | 16 | 79 | 19 | 2 | 44324 | **38,06** | 41652 | **52,79** |
| **19,00** | 16 | 79 | 19 | 2 | 44327 | **48,01** | 41653 | **63,97** |
| **20,00** | 20 | 88 | 22 | 2 | 44330 | **45,43** | 41655 | **61,48** |
| **22,00** | 20 | 88 | 22 | 2 | 44333 | **59,45** | 41658 | **81,59** |
| **24,00** | 25 | 102 | 26 | 2 | 44336 | **79,59** | 41659 | **101,17** |
| **25,00** | 25 | 102 | 26 | 2 | 44339 | **75,31** | 41661 | **97,04** |
| **28,00** | 25 | 102 | 26 | 2 | 44342 | **95,30** | 41662 | **126,40** |
| **30,00** | 25 | 102 | 26 | 2 | 44345 | **108,59** | 41664 | **139,32** |
| **32,00** | 32 | 112 | 32 | 2 | 44348 | **111,53** | 41943 | **142,15** |
| **36,00** | 32 | 112 | 32 | 2 | 44351 | **149,20** | 41944 | **182,44** |
| **40,00** | 40 | 130 | 38 | 2 | 44354 | **183,18** | 41945 | **225,65** |

# Ref. 4426

## FRESA FRONTAL ACABADO HSSE 8% CO 2Z LARGA
Long 2Z HSSE 8% Co Finishing End Mill
Fraise finition HSSE 8% Co 2Z longue




HSSE 8% Co | HSSE 8% Co + TIALSIN | IZAR Std. N | ISO 1641 | 30° | DIN 1835 B | Tol. D (e8) d (h6)




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 |
| P | P.1 | 30-40 | 40-56 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| K | K.1 | 20-30 | 25-45 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | K.2 | 15-20 | 20-25 | 0,014 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.1 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.2 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.3 | 160-200 | 220-280 | 0,025 | 0,042 | 0,062 | 0,067 | 0,080 | 0,100 | 0,130 | 0,130 | 0,130 | 0,130 |
| | N.4 | 160-200 | 220-280 | 0,025 | 0,042 | 0,062 | 0,067 | 0,080 | 0,100 | 0,130 | 0,130 | 0,130 | 0,130 |
| | N.5 | 50-80 | 70-110 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

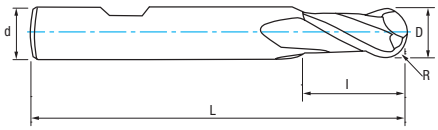
**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **2,00** | 6 | 54 | 7 | 2 | 44357 | **12,52** | 16074 | **19,67** |
| **2,50** | 6 | 56 | 8 | 2 | 44360 | **12,52** | 16092 | **19,67** |
| **3,00** | 6 | 56 | 8 | 2 | 44363 | **12,52** | 45029 | **19,67** |
| **4,00** | 6 | 63 | 11 | 2 | 44366 | **12,52** | 45030 | **19,67** |
| **5,00** | 6 | 68 | 13 | 2 | 44369 | **12,52** | 45031 | **19,67** |
| **6,00** | 6 | 68 | 13 | 2 | 44372 | **12,52** | 45032 | **19,67** |
| **7,00** | 10 | 80 | 16 | 2 | 44375 | **20,80** | 17192 | **28,83** |
| **8,00** | 10 | 88 | 19 | 2 | 44378 | **18,19** | 45034 | **26,33** |
| **9,00** | 10 | 88 | 19 | 2 | 44381 | **24,63** | 15849 | **33,36** |
| **10,00** | 10 | 95 | 22 | 2 | 44384 | **20,80** | 14538 | **30,59** |
| **11,00** | 12 | 102 | 22 | 2 | 44387 | **31,84** | 17193 | **42,66** |
| **12,00** | 12 | 110 | 26 | 2 | 44390 | **29,52** | 14550 | **40,37** |
| **12,00** | 12 | 110 | 53 | 2 | 13494 | **29,52** | 13497 | **40,37** |
| **14,00** | 12 | 110 | 26 | 2 | 44393 | **38,39** | 17194 | **49,34** |
| **14,00** | 12 | 110 | 53 | 2 | 13500 | **38,39** | 13509 | **49,34** |
| **16,00** | 16 | 123 | 32 | 2 | 44396 | **45,17** | 17195 | **60,80** |
| **16,00** | 16 | 123 | 63 | 2 | 13506 | **45,17** | 13515 | **60,80** |
| **18,00** | 16 | 123 | 32 | 2 | 44399 | **53,86** | 14562 | **71,31** |
| **18,00** | 16 | 123 | 63 | 2 | 13512 | **53,86** | 13532 | **71,31** |
| **20,00** | 20 | 141 | 38 | 2 | 44402 | **59,10** | 17197 | **78,26** |
| **20,00** | 20 | 141 | 75 | 2 | 13514 | **59,10** | 13535 | **78,26** |
| **22,00** | 20 | 141 | 38 | 2 | 44405 | **79,78** | 17198 | **106,19** |
| **25,00** | 25 | 166 | 45 | 2 | 44408 | **114,45** | 17199 | **142,90** |
| **28,00** | 25 | 166 | 45 | 2 | 44411 | **137,36** | 17200 | **173,83** |
| **30,00** | 25 | 166 | 45 | 2 | 81024 | **151,81** | 17201 | **187,89** |
| **32,00** | 32 | 186 | 53 | 2 | 44414 | **211,24** | 17202 | **245,69** |

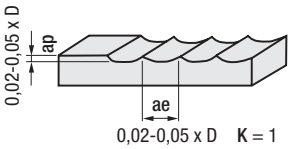
**TIALSIN bajo demanda / upon request** / sur demande

# Ref. 4422

## FRESA FRONTAL ACABADO HSSE 8% CO 2Z RADIAL
Radial 2Z HSSE 8% Co Finishing End Mill
Fraise finition HSSE 8% Co 2Z hemisphérique




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 327 N | 30° | DIN 1835 B | Tol. D (e8) d (h6)




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 30 |
| P | P.1 | 30-40 | 40-56 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| K | K.1 | 20-30 | 25-45 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| | K.2 | 15-20 | 20-25 | 0,014 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.1 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.2 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

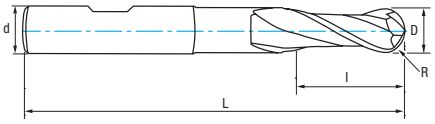
**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **2,00** | 6 | 48 | 4 | 2 | 69568 | **23,18** | 17181 | **30,03** |
| **3,00** | 6 | 49 | 5 | 2 | 69625 | **23,18** | 17182 | **30,03** |
| **4,00** | 6 | 51 | 7 | 2 | 69628 | **23,18** | 15427 | **30,03** |
| **5,00** | 6 | 52 | 8 | 2 | 69631 | **23,18** | 17156 | **30,03** |
| **6,00** | 6 | 52 | 8 | 2 | 69634 | **23,18** | 15428 | **30,03** |
| **7,00** | 10 | 60 | 10 | 2 | 69637 | **27,91** | 19597 | **35,79** |
| **8,00** | 10 | 61 | 11 | 2 | 69640 | **24,87** | 16191 | **32,81** |
| **9,00** | 10 | 61 | 11 | 2 | 69643 | **28,59** | 18810 | **37,19** |
| **10,00** | 10 | 63 | 13 | 2 | 69646 | **24,67** | 17158 | **33,40** |
| **11,00** | 12 | 70 | 13 | 2 | 69649 | **34,92** | 17887 | **44,60** |
| **12,00** | 12 | 73 | 16 | 2 | 69651 | **33,07** | 17159 | **42,83** |
| **13,00** | 12 | 73 | 16 | 2 | 69652 | **43,70** | 17888 | **54,51** |
| **14,00** | 12 | 73 | 16 | 2 | 69654 | **43,70** | 17161 | **54,51** |
| **15,00** | 12 | 73 | 16 | 2 | 69655 | **48,90** | 17162 | **61,61** |
| **16,00** | 16 | 79 | 19 | 2 | 69657 | **47,78** | 17163 | **60,53** |
| **18,00** | 16 | 79 | 19 | 2 | 69660 | **58,17** | 18061 | **72,38** |
| **20,00** | 20 | 88 | 22 | 2 | 69663 | **69,48** | 17180 | **84,86** |
| **22,00** | 20 | 88 | 22 | 2 | 69666 | **90,92** | 21809 | **112,22** |
| **24,00** | 25 | 102 | 26 | 2 | 69667 | **108,62** | 21606 | **129,45** |
| **25,00** | 25 | 102 | 26 | 2 | 69669 | **99,84** | 18243 | **120,89** |
| **30,00** | 25 | 102 | 26 | 2 | 69672 | **143,91** | 18244 | **173,72** |

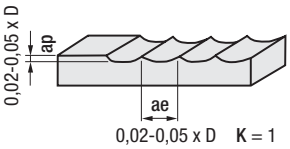
**TIALSIN bajo demanda / upon request** / sur demande

# Ref. 4470

## FRESA FRONTAL ACABADO HSSE 8% CO 2Z RADIAL LARGA
Long Radial 2Z HSSE 8% Co Finishing End Mill
Fraise finition HSSE 8% Co 2Z hemisphérique longue




HSSE 8% Co | HSSE 8% Co + TIALSIN | IZAR Std. N | 30° | DIN 1835 B | Tol. D (e8) d (h6)




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 30 |
| P | P.1 | 30-40 | 40-56 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| K | K.1 | 20-30 | 25-45 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| | K.2 | 15-20 | 20-25 | 0,014 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.1 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.2 | 60-100 | 80-140 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

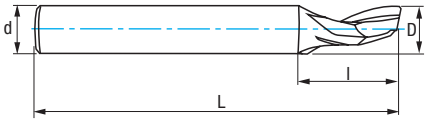
**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **2,00** | 6 | 54 | 7 | 2 | 45281 | **25,37** | 18115 | **32,19** |
| **2,50** | 6 | 56 | 8 | 2 | 45284 | **25,37** | 18117 | **32,19** |
| **3,00** | 6 | 56 | 8 | 2 | 45287 | **25,37** | 18120 | **32,19** |
| **4,00** | 6 | 63 | 11 | 2 | 45290 | **25,37** | 18121 | **32,19** |
| **5,00** | 6 | 68 | 13 | 2 | 45293 | **26,87** | 18124 | **33,65** |
| **6,00** | 6 | 68 | 13 | 2 | 45296 | **24,26** | 17252 | **31,12** |
| **7,00** | 10 | 80 | 16 | 2 | 45299 | **30,63** | 18126 | **38,41** |
| **8,00** | 10 | 88 | 19 | 2 | 45302 | **30,63** | 17255 | **38,41** |
| **9,00** | 10 | 88 | 19 | 2 | 45305 | **33,65** | 18128 | **42,12** |
| **10,00** | 10 | 95 | 22 | 2 | 45308 | **33,65** | 17257 | **43,07** |
| **11,00** | 12 | 102 | 22 | 2 | 45311 | **44,82** | 18129 | **55,26** |
| **12,00** | 12 | 110 | 26 | 2 | 45314 | **44,82** | 17293 | **55,26** |
| **14,00** | 12 | 110 | 26 | 2 | 45317 | **59,10** | 18130 | **69,46** |
| **16,00** | 16 | 123 | 32 | 2 | 45320 | **67,03** | 18132 | **82,05** |
| **18,00** | 16 | 123 | 32 | 2 | 45323 | **80,55** | 18133 | **97,30** |
| **20,00** | 20 | 141 | 38 | 2 | 45326 | **87,32** | 18135 | **105,68** |
| **22,00** | 20 | 141 | 38 | 2 | 45329 | **108,27** | 18136 | **133,87** |
| **24,00** | 25 | 166 | 45 | 2 | 40908 | **146,49** | 18138 | **174,06** |
| **25,00** | 25 | 166 | 45 | 2 | 45332 | **133,17** | 18139 | **161,09** |
| **30,00** | 25 | 166 | 45 | 2 | 77816 | **195,74** | 18141 | **230,59** |
| **32,00** | 32 | 186 | 53 | 2 | 45338 | **254,46** | 18142 | **287,67** |

**TIALSIN bajo demanda / upon request** / sur demande

# Ref. 4410

## FRESA FRONTAL ACABADO HSSE 5% CO 1Z ALUMINIO
Aluminium 1Z HSSE 5% Co Finishing End Mill
Fraise finition HSSE 5% Co 1Z aluminium




HSSE 5% Co | IZAR Std. W | DIN 1835 A | Tol.* D (k10) d (h6) | *øD=ød ⇒Tol. D (js14) d (h6)

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | |
|---|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 4 | Ø 6 | Ø 8 | Ø 10 |
| N | N.3 | 160-200 | 0,025 | 0,042 | 0,062 | 0,067 |
| | N.4 | 160-200 | 0,025 | 0,042 | 0,062 | 0,067 |
| | N.5 | 50-80 | 0,020 | 0,030 | 0,035 | 0,050 |
| | N.6 | 40-70 | 0,018 | 0,030 | 0,040 | 0,055 |

| D mm | d mm | L mm | l mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|
| 3,00 | 8 | 60 | 12 | 1 | 13932 | 16,85 |
| 4,00 | 8 | 60 | 12 | 1 | 13933 | 16,85 |
| 5,00 | 8 | 60 | 12 | 1 | 13935 | 16,85 |
| 6,00 | 8 | 60 | 14 | 1 | 13936 | 16,85 |
| 7,00 | 8 | 60 | 14 | 1 | 13937 | 20,57 |
| 8,00 | 8 | 80 | 15 | 1 | 13938 | 20,57 |
| 10,00 | 10 | 80 | 15 | 1 | 13939 | 21,17 |

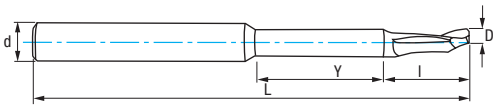
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

Vf (mm/min.) = r.p.m. x Z x fz x K

K = Coeficiente corrección
Correction coefficient
Coéficient correction

# Ref. 4411

## FRESA FRONTAL ACABADO HSSE 5% CO 1Z ALUMINIO LARGA
Long Aluminium 1Z HSSE 5% Co Finishing End Mill
Fraise finition HSSE 5% Co 1Z aluminium longue




HSSE 5% Co | IZAR Std. W | DIN 1835 A | Y | Tol.* D (k10) d (h6) | *øD=ød ⇒Tol. D (js14) d (h6)

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | |
|---|---|---|---|---|---|
| Grupo | Sub. | 5% Co | Ø 4 | Ø 6 | Ø 8 |
| N | N.3 | 160-200 | 0,025 | 0,042 | 0,062 |
| | N.4 | 160-200 | 0,025 | 0,042 | 0,062 |
| | N.5 | 50-80 | 0,020 | 0,030 | 0,035 |
| | N.6 | 40-70 | 0,018 | 0,030 | 0,040 |

| D mm | d mm | L mm | l mm | Y mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|---|
| 4,00 | 8 | 80 | 16 | 29 | 1 | 13941 | 23,80 |
| 5,00 | 8 | 80 | 16 | 29 | 1 | 13943 | 23,80 |
| 6,00 | 8 | 90 | 16 | 29 | 1 | 13944 | 23,80 |
| 8,00 | 8 | 100 | 28 | 40 | 1 | 13945 | 26,42 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

Vf (mm/min.) = r.p.m. x Z x fz x K

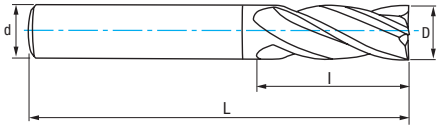
K = Coeficiente corrección
Correction coefficient
Coéficient correction

Ref. 4410

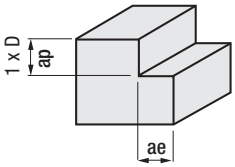
Ref. 4411

# Ref. 4401

## FRESA FRONTAL ACABADO HSS NZ
NZ HSS Finishing End Mill
Fraise finition HSS NZ




HSS | DIN 844 N | ISO 1641 | | 4-8 Z | | 30° | DIN 1835 B | Tol. D (k10) d (h6)




**No válida Trabajo Axial**
**Not Valid for Axial Work**
Invalide pour travail dans l´axe

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 |
| P | P.1 | 20-28 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

| D mm | d mm | L mm | l mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| 2,00 | 6 | 51 | 7 | 4 | 43691 | 9,61 |
| 2,50 | 6 | 52 | 8 | 4 | 43694 | 9,61 |
| 3,00 | 6 | 52 | 8 | 4 | 43697 | 9,61 |
| 3,50 | 6 | 54 | 10 | 4 | 43700 | 9,88 |
| 4,00 | 6 | 55 | 11 | 4 | 43703 | 9,61 |
| 4,50 | 6 | 55 | 11 | 4 | 77567 | 9,99 |
| 5,00 | 6 | 57 | 13 | 4 | 43706 | 9,61 |
| 5,50 | 6 | 57 | 13 | 4 | 77568 | 14,88 |
| 6,00 | 6 | 57 | 13 | 4 | 43709 | 9,61 |
| 6,50 | 10 | 66 | 16 | 4 | 77569 | 14,88 |
| 7,00 | 10 | 66 | 16 | 4 | 43712 | 14,05 |
| 7,50 | 10 | 66 | 16 | 4 | 78894 | 17,61 |
| 8,00 | 10 | 69 | 19 | 4 | 43715 | 10,90 |
| 8,50 | 10 | 69 | 19 | 4 | 78895 | 18,34 |
| 9,00 | 10 | 69 | 19 | 4 | 43718 | 14,70 |
| 9,50 | 10 | 69 | 19 | 4 | 78896 | 19,96 |
| 10,00 | 10 | 72 | 22 | 4 | 43721 | 13,34 |
| 11,00 | 12 | 79 | 22 | 4 | 43724 | 18,40 |
| 12,00 | 12 | 83 | 26 | 4 | 43727 | 15,83 |
| 13,00 | 12 | 83 | 26 | 4 | 43730 | 23,65 |
| 14,00 | 12 | 83 | 26 | 4 | 43733 | 22,34 |
| 15,00 | 12 | 83 | 26 | 4 | 43736 | 25,51 |
| 16,00 | 16 | 92 | 32 | 4 | 43739 | 24,88 |
| 17,00 | 16 | 92 | 32 | 4 | 43742 | 30,63 |
| 18,00 | 16 | 92 | 32 | 4 | 43745 | 30,63 |
| 19,00 | 16 | 92 | 32 | 4 | 43748 | 36,35 |
| 20,00 | 20 | 104 | 38 | 4 | 43751 | 35,92 |
| 22,00 | 20 | 104 | 38 | 6 | 43754 | 49,84 |
| 24,00 | 25 | 121 | 45 | 6 | 43757 | 61,89 |
| 25,00 | 25 | 121 | 45 | 6 | 43760 | 61,89 |
| 26,00 | 25 | 121 | 45 | 6 | 78897 | 77,38 |
| 28,00 | 25 | 121 | 45 | 6 | 43763 | 77,38 |
| 30,00 | 25 | 121 | 45 | 6 | 43766 | 89,56 |
| 32,00 | 32 | 133 | 53 | 6 | 43769 | 92,24 |
| 36,00 | 32 | 133 | 53 | 6 | 43772 | 120,76 |
| 40,00 | 40 | 155 | 63 | 8 | 43775 | 145,15 |

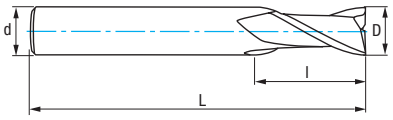
$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

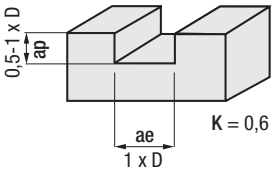
**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

# Ref. 4421

## FRESA FRONTAL ACABADO HSS 2Z
2Z HSS Finishing End Mill
Fraise finition HSS 2Z




HSS | DIN 327 N | ISO 1641/1 | 30° | DIN 1835 B | Tol. D (e8) d (h6)




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 |
| P | P.1 | 20-28 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

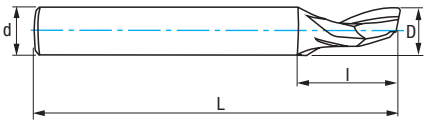
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | d mm | L mm | l mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| **2,00** | 6 | 48 | 4 | 2 | 44162 | **9,11** |
| **2,50** | 6 | 49 | 5 | 2 | 44165 | **9,11** |
| **3,00** | 6 | 49 | 5 | 2 | 44168 | **9,11** |
| **3,50** | 6 | 50 | 6 | 2 | 44171 | **9,51** |
| **4,00** | 6 | 51 | 7 | 2 | 44174 | **9,11** |
| **4,50** | 6 | 52 | 8 | 2 | 73802 | **10,25** |
| **5,00** | 6 | 52 | 8 | 2 | 44177 | **9,11** |
| **5,50** | 6 | 52 | 8 | 2 | 73805 | **11,18** |
| **6,00** | 6 | 52 | 8 | 2 | 44180 | **9,11** |
| **6,50** | 10 | 60 | 10 | 2 | 73808 | **14,33** |
| **7,00** | 10 | 60 | 10 | 2 | 44183 | **13,52** |
| **7,50** | 10 | 61 | 11 | 2 | 73811 | **14,07** |
| **8,00** | 10 | 61 | 11 | 2 | 44186 | **11,08** |
| **8,50** | 10 | 61 | 11 | 2 | 73814 | **15,79** |
| **9,00** | 10 | 61 | 11 | 2 | 44189 | **14,15** |
| **9,50** | 10 | 61 | 11 | 2 | 73817 | **15,48** |
| **10,00** | 10 | 63 | 13 | 2 | 44192 | **11,62** |
| **11,00** | 12 | 70 | 13 | 2 | 44195 | **17,70** |
| **12,00** | 12 | 73 | 16 | 2 | 44198 | **15,24** |
| **13,00** | 12 | 73 | 16 | 2 | 44201 | **22,76** |
| **14,00** | 12 | 73 | 16 | 2 | 44204 | **21,50** |
| **15,00** | 12 | 73 | 16 | 2 | 44207 | **24,56** |
| **16,00** | 16 | 79 | 19 | 2 | 44210 | **22,46** |
| **17,00** | 16 | 79 | 19 | 2 | 44213 | **29,50** |
| **18,00** | 16 | 79 | 19 | 2 | 44216 | **29,50** |
| **19,00** | 16 | 79 | 19 | 2 | 44219 | **36,26** |
| **20,00** | 20 | 88 | 22 | 2 | 44222 | **34,58** |
| **22,00** | 20 | 88 | 22 | 2 | 44225 | **47,54** |
| **24,00** | 25 | 102 | 26 | 2 | 44228 | **59,58** |
| **25,00** | 25 | 102 | 26 | 2 | 44231 | **59,58** |
| **28,00** | 25 | 102 | 26 | 2 | 44234 | **74,49** |
| **30,00** | 25 | 102 | 26 | 2 | 44237 | **86,21** |
| **32,00** | 32 | 112 | 32 | 2 | 44240 | **88,79** |
| **36,00** | 32 | 112 | 32 | 2 | 44243 | **116,25** |
| **40,00** | 40 | 130 | 38 | 2 | 44246 | **139,72** |

# Ref. 4412

## FRESA FRONTAL ACABADO HSS 1Z ALUMINIO
Aluminium 1Z HSS Finishing End Mill
Fraise finition HSS 1Z aluminium




| HSS | IZAR Std. W | **Serie Corta Short Length** Série courte | DIN 1835 A | d= 8-10 mm | Tol.* D (k10) d (h6) | *øD=ød ⇒Tol. D (js14) d (h6) |
|---|---|---|---|---|---|---|

| D mm | d mm | L mm | l mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| **3,00** | 8 | 60 | 12 | 1 | 44087 | **12,36** |
| **4,00** | 8 | 60 | 12 | 1 | 44090 | **12,36** |
| **5,00** | 8 | 60 | 12 | 1 | 44093 | **12,36** |
| **6,00** | 8 | 60 | 14 | 1 | 44096 | **12,36** |
| **7,00** | 8 | 60 | 14 | 1 | 44099 | **15,10** |
| **8,00** | 8 | 80 | 15 | 1 | 44102 | **15,10** |
| **10,00** | 10 | 80 | 15 | 1 | 44105 | **15,53** |

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | |
|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 4 | Ø 6 | Ø 8 | Ø 10 |
| N | N.3 | 100-160 | 0,024 | 0,040 | 0,060 | 0,090 |
| | N.4 | 100-160 | 0,024 | 0,040 | 0,060 | 0,090 |
| | N.5 | 100-160 | 0,015 | 0,025 | 0,035 | 0,060 |
| | N.6 | 40-70 | 0,012 | 0,022 | 0,035 | 0,055 |

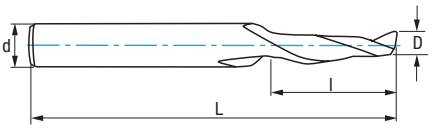
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

# Ref. 4413

## FRESA FRONTAL ACABADO HSS 1Z ALUMINIO
Aluminium 1Z HSS Finishing End Mill
Fraise finition HSS 1Z aluminium




| HSS | IZAR Std. W | **Serie Corta Short Length** Série courte | DIN 1835 A | d= 6 mm | Tol.* D (k10) d (h6) | *øD=ød ⇒Tol. D (js14) d (h6) |
|---|---|---|---|---|---|---|

| D mm | d mm | L mm | l mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|
| **3,00** | 6 | 60 | 12 | 1 | 44108 | **12,36** |
| **4,00** | 6 | 60 | 12 | 1 | 44111 | **12,36** |
| **5,00** | 6 | 60 | 12 | 1 | 44114 | **12,36** |
| **6,00** | 6 | 60 | 14 | 1 | 44117 | **12,36** |

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | |
|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 4 | Ø 6 |
| N | N.3 | 100-160 | 0,024 | 0,040 |
| | N.4 | 100-160 | 0,024 | 0,040 |
| | N.5 | 100-160 | 0,015 | 0,025 |
| | N.6 | 40-70 | 0,012 | 0,022 |

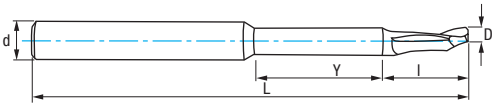
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

# Ref. 4414

## FRESA FRONTAL ACABADO HSS 1Z ALUMINIO
Aluminium 1Z HSS Finishing End Mill
Fraise finition HSS 1Z aluminium




| HSS | IZAR Std. W | **Serie Larga** **Long Length** Série longue | d= 8-10 mm | DIN 1835 A | Y | Tol.* D (k10) d (h6) | *øD=ød ⇒Tol. D (js14) d (h6) |
|---|---|---|---|---|---|---|---|

| D mm | d mm | L mm | l mm | Y mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| **4,00** | 8 | 80 | 16 | 29 | 1 | 44120 | **17,47** |
| **5,00** | 8 | 80 | 16 | 29 | 1 | 44123 | **17,47** |
| **6,00** | 8 | 90 | 16 | 29 | 1 | 44126 | **17,47** |
| **8,00** | 8 | 100 | 28 | 40 | 1 | 44129 | **19,39** |
| **10,00** | 10 | 120 | 40 | 40 | 1 | 29178 | **19,98** |

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | |
|---|---|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 4 | Ø 6 | Ø 8 | Ø 10 |
| N | N.3 | 100-160 | 0,024 | 0,040 | 0,060 | 0,090 |
| | N.4 | 100-160 | 0,024 | 0,040 | 0,060 | 0,090 |
| | N.5 | 100-160 | 0,015 | 0,025 | 0,035 | 0,060 |
| | N.6 | 40-70 | 0,012 | 0,022 | 0,035 | 0,055 |

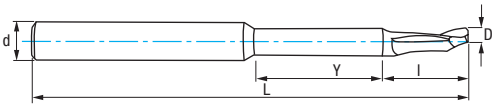
$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

# Ref. 4415

## FRESA FRONTAL ACABADO HSS 1Z ALUMINIO
Aluminium 1Z HSS Finishing End Mill
Fraise finition HSS 1Z aluminium




| HSS | IZAR Std. W | **Serie Larga** **Long Length** Série longue | d= 6 mm | DIN 1835 A | Y | Tol.* D (k10) d (h6) | *øD=ød ⇒Tol. D (js14) d (h6) |
|---|---|---|---|---|---|---|---|

| D mm | d mm | L mm | l mm | Y mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| **5,00** | 6 | 80 | 14 | 31 | 1 | 44132 | **17,47** |
| **6,00** | 6 | 80 | 14 | 31 | 1 | 44135 | **17,47** |

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas |
|---|---|---|---|
| Grupo | Sub. | HSS | Ø 6 |
| N | N.3 | 100-160 | 0,040 |
| | N.4 | 100-160 | 0,040 |
| | N.5 | 100-160 | 0,025 |
| | N.6 | 40-70 | 0,022 |

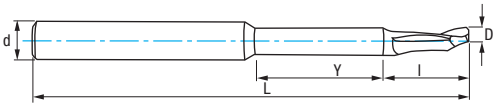
$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

# Ref. 4416

## FRESA FRONTAL ACABADO HSS 1Z ALUMINIO
Aluminium 1Z HSS Finishing End Mill
Fraise finition HSS 1Z aluminium




| HSS | IZAR Std. W | **Serie Larga Long Length** Série longue | d= 8 mm | | Y | Tol.* D (k10) d (h6) | *øD=ød ⇒Tol. D (js14) d (h6) |
|---|---|---|---|---|---|---|---|

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | |
|---|---|---|---|---|
| Grupo | Sub. | HSS | Ø 4 | Ø 5 |
| N | N.3 | 100-160 | 0,024 | 0,040 |
| | N.4 | 100-160 | 0,024 | 0,040 |
| | N.5 | 100-160 | 0,015 | 0,025 |
| | N.6 | 40-70 | 0,012 | 0,022 |

| D mm | d mm | L mm | l mm | Y mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| **4,00** | 8 | 80 | 16 | 19 | 1 | 74142 | **17,47** |
| **5,00** | 8 | 80 | 16 | 19 | 1 | 74145 | **17,47** |

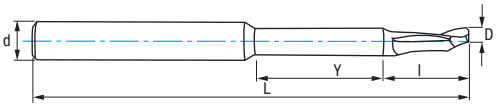
$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

# Ref. 4417

## FRESA FRONTAL ACABADO HSS 1Z ALUMINIO
Aluminium 1Z HSS Finishing End Mill
Fraise finition HSS 1Z aluminium




| HSS | IZAR Std. W | **Serie Larga Long Length** Série longue | d= 8 mm | DIN 1835 A | Y | Tol.* D (k10) d (h6) | *øD=ød ⇒Tol. D (js14) d (h6) |
|---|---|---|---|---|---|---|---|

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas |
|---|---|---|---|
| Grupo | Sub. | HSS | Ø 5 |
| N | N.3 | 100-160 | 0,040 |
| | N.4 | 100-160 | 0,040 |
| | N.5 | 100-160 | 0,025 |
| | N.6 | 40-70 | 0,022 |

| D mm | d mm | L mm | l mm | Y mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| **5,00** | 8 | 100 | 35 | 20 | 1 | 44138 | **17,47** |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

# SETS FRESADO PMX - HSSE
## PMX – HSSE Milling Sets
## Jeux de fraisage PMX - HSSE

**Set Price!**

**Benefíciate de un 5% de descuento extra en nuestros sets de Fresas**
**Get an extra 5% discount on our End Mill sets**
Bénéficiez d'une remise supplémentaire de 5 % sur nos jeux de fraises

# Sets 6644

**FRESA FRONTAL DESBASTE FINO PMX NZ**
NZ PMX Fine Pitch Roughing End Mill
Fraise ébauche pas fin PMX NZ

**8 Pcs**

| Cont. | N° Art. PMX | € |
|---|---|---|
| 6-8-10-12-14-16-18-20 mm | 14904 | Set Price! **497,46** |

**4 Pcs**

| Cont. | N° Art. PMX | € |
|---|---|---|
| 6-8-10-12 mm | 14241 | Set Price! **169,28** |

**8 Pcs**

| Cont. | N° Art TIALN-TOP | € |
|---|---|---|
| 6-8-10-12-14-16-18-20 mm | 14907 | Set Price! **571,49** |

**4 Pcs**

| Cont. | N° Art TIALN-TOP | € |
|---|---|---|
| 6-8-10-12 mm | 14275 | Set Price! **198,27** |

# Sets 6647

**FRESA FRONTAL DESBASTE FINO PMX NZ INOX**
Stainless NZ PMX Fine Pitch Roughing End Mill
Fraise ébauche pas fin PMX NZ Inox

**8 Pcs**

| Cont. | N° Art TIALN-TOP | € |
|---|---|---|
| 6-8-10-12-14-16-18-20 mm | 66387 | Set Price! **621,20** |

**4 Pcs**

| Cont. | N° Art TIALN-TOP | € |
|---|---|---|
| 6-8-10-12 mm | 14293 | Set Price! **215,17** |

# Sets 4644

**FRESA FRONTAL DESBASTE FINO HSSE 8% CO NZ**
NZ HSSE 8% Co Fine Pitch Roughing End Mill
Fraise ébauche pas fin HSSE 8% Co NZ

6 Pcs

| Cont. | N° Art. 8% Co | € |
|---|---|---|
| 4-5-6-8-10-12 mm | 14300 | Set Price! **223,65** |

6 Pcs

| Cont. | N° Art. TIALSIN | € |
|---|---|---|
| 4-5-6-8-10-12 mm | 14303 | Set Price! **267,29** |

# Sets 6600

**FRESA FRONTAL ACABADO PMX NZ**
NZ PMX Finishing End Mill
Fraise finition PMX NZ

10 Pcs

| Cont. | N° Art. PMX | € |
|---|---|---|
| 4-5-6-8-10-12-14-16-18-20 mm | 14911 | Set Price! **313,54** |

10 Pcs

| Cont. | N° Art TIALN-TOP | € |
|---|---|---|
| 4-5-6-8-10-12-14-16-18-20 mm | 14913 | Set Price! **395,01** |

6 Pcs

| Cont. | N° Art. PMX | € |
|---|---|---|
| 4-5-6-8-10-12 mm | 14294 | Set Price! **115,92** |

6 Pcs

| Cont. | N° Art TIALN-TOP | € |
|---|---|---|
| 4-5-6-8-10-12 mm | 14295 | Set Price! **155,30** |

# Sets 6430

**FRESA FRONTAL ACABADO PMX 3Z ALUMINIO**

Aluminium 3Z PMX Finishing End Mill

Fraise finition PMX 3Z aluminium

10 Pcs

| Cont. | N° Art. PMX | € |
|---|---|---|
| 4-5-6-8-10-12-14-16-18-20 mm | 14919 | Set Price! 345,38 |

10 Pcs

| Cont. | N° Art TIALN-TOP | € |
|---|---|---|
| 4-5-6-8-10-12-14-16-18-20 mm | 14922 | Set Price! 427,15 |

6 Pcs

| Cont. | N° Art. PMX | € |
|---|---|---|
| 4-5-6-8-10-12 mm | 14296 | Set Price! 128,02 |

6 Pcs

| Cont. | N° Art TIALN-TOP | € |
|---|---|---|
| 4-5-6-8-10-12 mm | 14297 | Set Price! 167,25 |

# Sets 6420

**FRESA FRONTAL ACABADO PMX 2Z**

2Z PMX Finishing End Mill

Fraise finition PMX 2Z

10 Pcs

| Cont. | N° Art. PMX | € |
|---|---|---|
| 4-5-6-8-10-12-14-16-18-20 mm | 14914 | Set Price! 292,92 |

10 Pcs

| Cont. | N° Art TIALN-TOP | € |
|---|---|---|
| 4-5-6-8-10-12-14-16-18-20 mm | 14916 | Set Price! 381,45 |

6 Pcs

| Cont. | N° Art. PMX | € |
|---|---|---|
| 4-5-6-8-10-12 mm | 14298 | Set Price! 106,49 |

6 Pcs

| Cont. | N° Art TIALN-TOP | € |
|---|---|---|
| 4-5-6-8-10-12 mm | 14299 | Set Price! 149,73 |

# Sets 4600

**FRESA FRONTAL ACABADO HSSE 8% CO NZ**

NZ HSSE 8% Co Finishing End Mill

Fraise finition HSSE 8% Co NZ

6 Pcs

| Cont. | N° Art. 8% Co | € |
|---|---|---|
| 4-5-6-8-10-12 mm | 14382 | Set Price! 89,40 |

6 Pcs

| Cont. | N° Art. TIALSIN | € |
|---|---|---|
| 4-5-6-8-10-12 mm | 14383 | Set Price! 134,13 |

# Sets 4420

**FRESA FRONTAL ACABADO HSSE 8% CO 2Z**

2Z HSSE 8% Co Finishing End Mill

Fraise finition HSSE 8% Co 2Z

6 Pcs

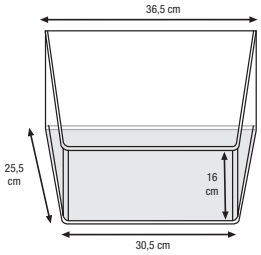
| Cont. | N° Art. 8% Co | € |
|---|---|---|
| 4-5-6-8-10-12 mm | 14384 | Set Price! 78,52 |

6 Pcs

| Cont. | N° Art. TIALSIN | € |
|---|---|---|
| 4-5-6-8-10-12 mm | 15076 | Set Price! 124,99 |

# Ref. 4995

## EXPOSITOR FRESAS FRONTALES
End Mill Exhibitor
Présentoir Fraises

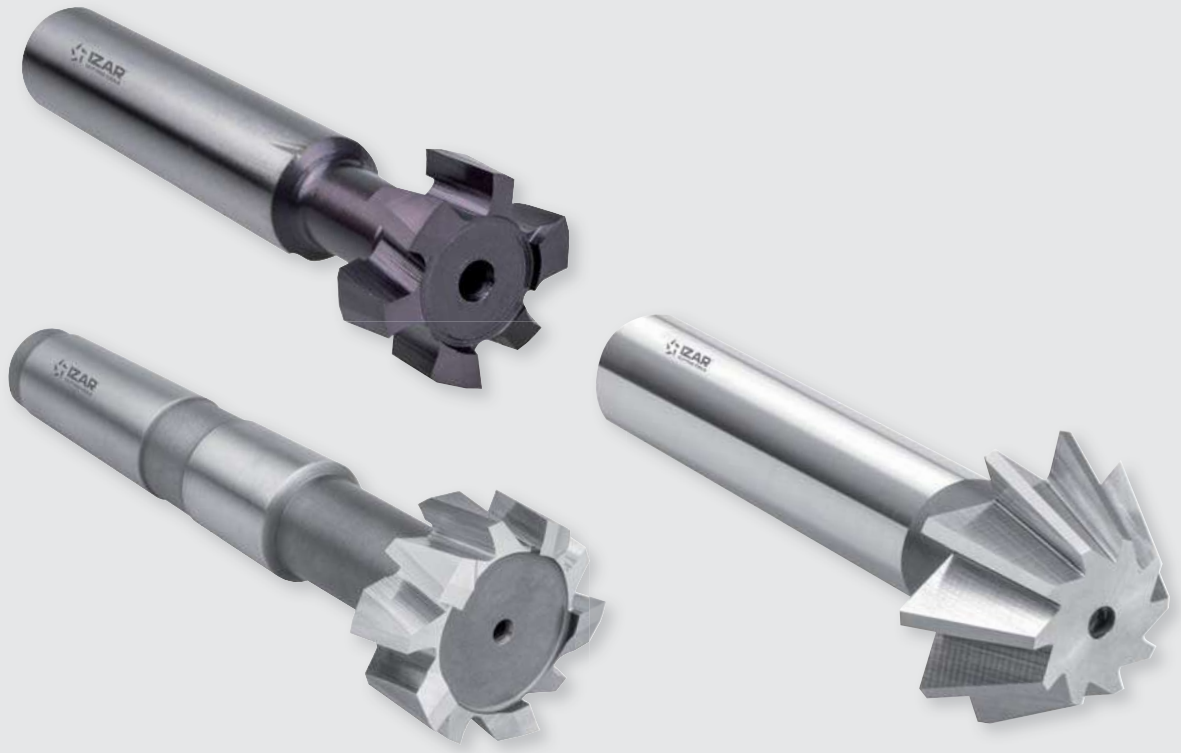



### 56 Pcs

| Cont. Ref. | Diam. mm | Uds. |
|---|---|---|
| 4600 4606 4430 4432 4420 4426 | 3 | 1 |
| | 4 | 1 |
| | 5 | 1 |
| | 6 | 1 |
| | 8 | 1 |
| | 10 | 1 |
| | 12 | 1 |
| 4640 4690 | 10 | 1 |
| | 12 | 1 |
| | 16 | 1 |
| Refs. HSS 4412 4414 | 4 | 1 |
| | 5 | 1 |
| | 6 | 1 |
| | 8 | 1 |

| N° Art. 8% Co | € |
|---|---|
| 67841 | Set Price! 1.068,86 |

| N° Art. TIALSIN | € |
|---|---|
| 67842 | Set Price! 1.454,11 |



# FRESAS EN “T”, WOODRUFF, 1/4 RADIO, ANGULARES

## “T” Slot, Woodruff, 1/4 Radius, Angle Shank Tool

## Fraises à T, Woodruff, rayon 1/4, coniques

### TABLA USO

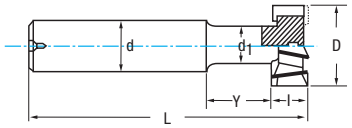
Use Table

Tableau d’usage

| Material | | | | Velocidad Corte Cutting Speed Vitesse de coupe (m/min.) | | Avance Feed Avance fz/rev. (mm/min.) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo / Subgrupo Group / Subgroup Groupe / S. Groupe | | | | HSSE 5% Co | TIALSIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 | Ø 50 | Ø 63 |
| P | | P.1 | <850 N/mm² | 20-30 | 28-40 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | | P.2 | < 1000 N/mm² | 15-20 | 20-25 | 0,014 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| K | FUNDICIÓN Cast Iron Fonte | K.1 | < 700 N/mm² | 15-20 | 20-25 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | | K.2 | 700-1000 N/mm² | 12-18 | 16-25 | 0,014 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | Cu - BRONCE - LATÓN Copper - Bronze - Brass Cuivre - Bronze - Laiton | N.1 | VIRUTA CORTA Short Chip Copeaux courts | 60-100 | 80-130 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | | N.2 | VIRUTA LARGA Long Chip Copeaux longs | 60-100 | 80-130 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | ALUMINIO - MAGNESIO Aluminium - Magnesium | N.3 | NO ALEADO Unalloyed Sans alliage | 160-200 | 190-240 | 0,025 | 0,042 | 0,062 | 0,067 | 0,080 | 0,100 | 0,130 | 0,130 | 0,130 | 0,130 | 0,130 | 0,130 |
| | | N.4 | < 10% Si | 160-200 | 190-240 | 0,025 | 0,042 | 0,062 | 0,067 | 0,080 | 0,100 | 0,130 | 0,130 | 0,130 | 0,130 | 0,130 | 0,130 |
| | | N.5 | > 10% Si | 50-80 | 60-90 | 0,020 | 0,030 | 0,035 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

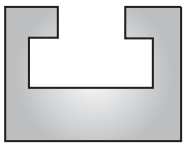
# Ref. 4800

## FRESA HSSE 8% CO RANURAS "T"
"T" Slots HSSE 8% Co Shank Tool
Fraise HSSE 8% Co rainures à "T"




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 851 AA N | ISO 3337 | 10° | DIN 1835 A | Tol. D (d11) d (h8) l (d11)

| Grupo Group-Groupe | Subgrup. |
|---|---|
| P | P.1 P.2 |
| K | |
| N | N.1 - N.2 N.3 - N.4 - N.5 |

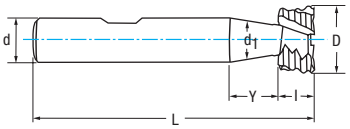


| D mm | l mm | d mm | L mm | d1 mm | Y mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **11,00** | 4 | 10 | 53,50 | 4 | 10,00 | 6 | 68868 | **85,10** | 17164 | **104,42** |
| **12,50** | 6 | 10 | 57,00 | 5 | 10,50 | 6 | 57822 | **88,48** | 17165 | **110,44** |
| **16,00** | 8 | 10 | 62,00 | 7 | 12,50 | 6 | 57831 | **97,30** | 13120 | **123,25** |
| **18,00** | 8 | 12 | 70,00 | 8 | 16,00 | 8 | 57840 | **102,44** | 17167 | **131,78** |
| **21,00** | 9 | 12 | 74,00 | 10 | 18,00 | 8 | 57849 | **112,88** | 14929 | **158,28** |
| **25,00** | 11 | 16 | 82,00 | 12 | 20,00 | 8 | 57858 | **127,38** | 15667 | **172,36** |
| **32,00** | 14 | 16 | 90,00 | 15 | 22,50 | 10 | 57867 | **160,24** | 17168 | **224,66** |
| **40,00** | 18 | 25 | 108,00 | 19 | 31,00 | 10 | 57876 | **222,24** | 17589 | **313,16** |

**TIALSIN bajo demanda / upon request** / sur demande

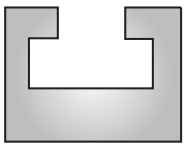
# Ref. 4802

## FRESA HSSE 8% CO RANURAS "T"
"T" Slots HSSE 8% Co Shank Tool
Fraise HSSE 8% Co rainures à "T"




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 851 AB NR | ISO 3337 | 30° | DIN 1835 B | Tol. D (d11) d (h8) l (d11)

| Grupo Group-Groupe | Subgrup. |
|---|---|
| P | P.1 P.2 |
| K | |
| N | N.1 - N.2 N.3 - N.4 - N.5 |

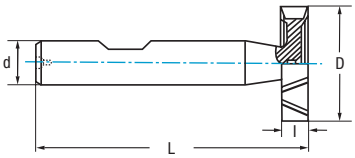


| D mm | l mm | d mm | L mm | d1 mm | Y mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **16,00** | 8 | 10 | 62 | 7 | 11,00 | 4 | 77751 | **96,87** | 22012 | **121,63** |
| **18,00** | 8 | 12 | 70 | 8 | 14,00 | 4 | 77753 | **107,13** | 22013 | **134,94** |
| **21,00** | 9 | 12 | 74 | 10 | 17,00 | 5 | 77756 | **122,78** | 21074 | **165,76** |
| **25,00** | 11 | 16 | 82 | 12 | 18,00 | 5 | 77757 | **143,19** | 21075 | **185,63** |
| **32,00** | 14 | 16 | 90 | 15 | 23,00 | 6 | 77758 | **187,77** | 18925 | **248,33** |
| **40,00** | 18 | 25 | 108 | 19 | 28,00 | 6 | 77759 | **287,62** | 18928 | **372,44** |

**TIALSIN bajo demanda / upon request** / sur demande

# Ref. 4834

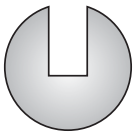
## FRESA HSSE 8% CO RANURAS WOODRUFF
Woodruff Slots HSSE 8% Co Shank Tool
Fraise HSSE 8% Co rainures Woodruff




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 850 D N | DIN 1835 B | Tol. D (h11) d (h8) l (e8)

*** Ref. 4830 bajo demanda**
upon request
sur demande

| Grupo Group-Groupe | Subgrup. |
|---|---|
| P | P.1 P.2 |
| K | |
| N | N.1 - N.2 N.3 - N.4 - N.5 |

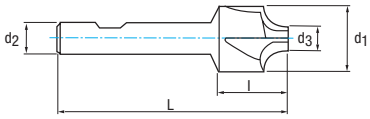


| D mm | l mm | d mm | L mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **4,50** | 1,00 | 6 | 50 | 6 | 22506 | **46,30** | 22533 | **53,02** |
| **7,50** | 1,50 | 6 | 50 | 6 | 22507 | **48,20** | 22534 | **56,11** |
| **7,50** | 2,00 | 6 | 50 | 6 | 22509 | **48,20** | 22536 | **56,11** |
| **10,50** | 2,00 | 6 | 50 | 8 | 22521 | **51,87** | 22537 | **60,44** |
| **10,50** | 2,50 | 6 | 50 | 8 | 22523 | **51,87** | 22539 | **60,54** |
| **10,50** | 3,00 | 6 | 50 | 8 | 22510 | **51,87** | 22540 | **60,54** |
| **13,50** | 3,00 | 10 | 56 | 8 | 22512 | **52,72** | 22542 | **63,62** |
| **13,50** | 4,00 | 10 | 56 | 8 | 22513 | **52,72** | 22543 | **63,62** |
| **16,50** | 3,00 | 10 | 56 | 8 | 22514 | **53,18** | 22545 | **67,97** |
| **16,50** | 4,00 | 10 | 56 | 8 | 22515 | **53,18** | 22546 | **67,97** |
| **16,50** | 5,00 | 10 | 56 | 8 | 22516 | **53,18** | 22547 | **67,97** |
| **19,50** | 4,00 | 10 | 63 | 10 | 22517 | **60,55** | 22548 | **76,67** |
| **19,50** | 5,00 | 10 | 63 | 10 | 22518 | **60,55** | 22549 | **76,67** |
| **19,50** | 6,00 | 10 | 63 | 10 | 22519 | **60,55** | 22550 | **76,67** |
| **22,50** | 5,00 | 10 | 63 | 10 | 22520 | **66,55** | 22551 | **89,24** |
| **22,50** | 6,00 | 10 | 63 | 10 | 22522 | **66,55** | 22552 | **89,24** |
| **22,50** | 8,00 | 10 | 63 | 10 | 22524 | **66,55** | 22553 | **89,24** |
| **25,50** | 6,00 | 10 | 63 | 10 | 22525 | **77,63** | 22554 | **110,26** |
| **28,50** | 6,00 | 10 | 63 | 10 | 22527 | **79,00** | 22555 | **111,59** |
| **28,50** | 8,00 | 10 | 63 | 10 | 22528 | **79,00** | 22556 | **111,59** |
| **28,50** | 10,00 | 12 | 71 | 10 | 22373 | **79,00** | 22557 | **111,59** |
| **32,50** | 7,00 | 12 | 71 | 12 | 22374 | **97,87** | 22558 | **133,74** |
| **32,50** | 8,00 | 12 | 71 | 12 | 22530 | **97,87** | 22560 | **133,74** |
| **32,50** | 10,00 | 12 | 71 | 12 | 22531 | **97,87** | 22563 | **133,74** |
| **45,50** | 10,00 | 12 | 71 | 14 | 22532 | **154,97** | 22564 | **219,76** |

**TIALSIN bajo demanda / upon request** / sur demande

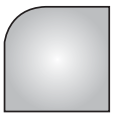
# Ref. 5080

## FRESA HSSE 8% CO RADIO 1/4
1/4 Radius HSSE 8% Co Shank Tool
Fraise HSSE 8% Co rayon 1/4



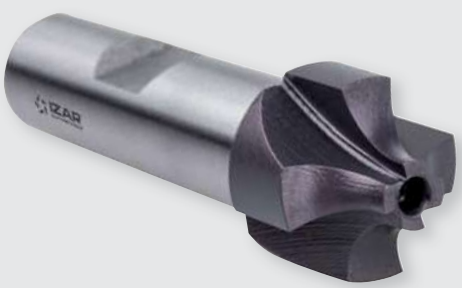

HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 6518 B N | **Serie Corta Short Length** Série courte | DIN 1835 B | Tol. R (H11) d2 (h6) | 1/4

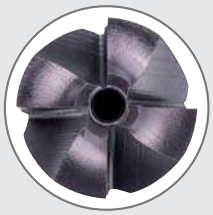
| Grupo Group-Groupe | Subgrup. |
|---|---|
| **P** | **P.1 P.2** |
| **K** | |
| **N** | **N.1 - N.2 N.3 - N.4 - N.5** |



| R | d3 mm | d1 mm | d2 mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **1,00** | 6,00 | 10,00 | 10 | 60 | | 4 | 77762 | **53,92** | 19925 | **71,50** |
| **1,60** | 6,00 | 10,00 | 10 | 60 | | 4 | 77763 | **49,09** | 19379 | **66,81** |
| **2,00** | 6,00 | 11,00 | 10 | 60 | | 4 | 77764 | **43,15** | 18048 | **61,01** |
| **2,50** | 6,00 | 11,00 | 10 | 60 | 8 | 4 | 77765 | **49,59** | 19928 | **68,96** |
| **3,00** | 6,00 | 12,00 | 12 | 60 | | 4 | 77766 | **49,59** | 18049 | **68,96** |
| **4,00** | 6,00 | 14,00 | 12 | 60 | 10 | 4 | 77767 | **54,87** | 18052 | **76,70** |
| **5,00** | 6,00 | 16,00 | 12 | 60 | 10 | 4 | 77768 | **62,60** | 17591 | **88,26** |
| **6,00** | 8,00 | 20,00 | 16 | 67 | 12 | 4 | 77769 | **62,60** | 18056 | **94,58** |
| **7,00** | 8,00 | 22,00 | 16 | 71 | 16 | 4 | 77770 | **85,71** | 19934 | **129,73** |
| **8,00** | 8,00 | 24,00 | 16 | 71 | 16 | 4 | 77771 | **85,71** | 17593 | **129,73** |
| **9,00** | 8,00 | 26,00 | 25 | 85 | 18 | 4 | 77772 | **111,69** | 19946 | **174,38** |
| **10,00** | 8,00 | 28,00 | 25 | 85 | 18 | 4 | 77773 | **111,69** | 19952 | **174,38** |
| **12,00** | 10,00 | 34,00 | 25 | 90 | 24 | 4 | 77774 | **122,29** | 19953 | **191,86** |
| **12,50** | 16,00 | 41,00 | 25 | 100 | 28 | 6 | 77775 | **138,67** | 19954 | **265,53** |
| **16,00** | 16,00 | 48,00 | 25 | 100 | 28 | 6 | 77776 | **236,84** | 19956 | **361,00** |
| **20,00** | 16,00 | 56,00 | 32 | 112 | 32 | 6 | 77777 | **343,73** | 21999 | **464,94** |

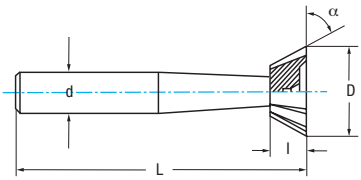
**TIALSIN bajo demanda / upon request** / sur demande





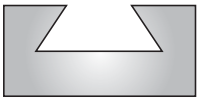
# Ref. 4330

## FRESA HSSE 8% CO ANGULAR
Single Angle HSSE 8% Co Shank Tool
Fraise HSSE 8% Co conique




| HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 1833 A N | ISO 3859 | DIN 1835 A | Tol. D (js16) d (h8) |
|---|---|---|---|---|---|

| Grupo Group-Groupe | Subgrup. | Grupo Group-Groupe | Grupo Group-Groupe | Subgrup. |
|---|---|---|---|---|
| P | P.1 P.2 | K | N | N.1 - N.2 N.3 - N.4 - N.5 |

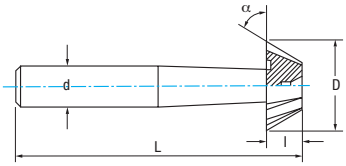


| D mm | Ang. | d mm | L mm | l mm | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|---|
| **16,00** | **45°** | 12 | 60 | 4,00 | 8 | 58656 | **86,38** | 19628 | **111,38** |
| **20,00** | **45°** | 12 | 63 | 5,00 | 8 | 58674 | **91,89** | 22407 | **123,07** |
| **25,00** | **45°** | 12 | 67 | 6,30 | 10 | 58701 | **112,03** | 22405 | **155,29** |
| **32,00** | **45°** | 16 | 71 | 8,00 | 12 | 58719 | **125,01** | 22406 | **187,32** |
| | | | | | | | | | |
| **16,00** | **60°** | 12 | 60 | 6,30 | 8 | 58665 | **86,38** | 21549 | **111,38** |
| **20,00** | **60°** | 12 | 63 | 8,00 | 8 | 58683 | **91,89** | 17857 | **123,07** |
| **25,00** | **60°** | 12 | 67 | 10,00 | 10 | 58710 | **112,03** | 17923 | **155,29** |
| **32,00** | **60°** | 16 | 71 | 12,50 | 12 | 58728 | **125,01** | 21469 | **187,32** |

**TIALSIN bajo demanda / upon request** / sur demande

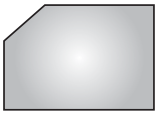
# Ref. 4340

## FRESA HSSE 8% CO ANGULAR
Single Angle HSSE 8% Co Shank Tool
Fraise HSSE 8% Co conique




| HSSE 8% Co | DIN 1833 B N | ISO 3859 | DIN 1835 A | Tol. D (js16) d (h8) |
|---|---|---|---|---|

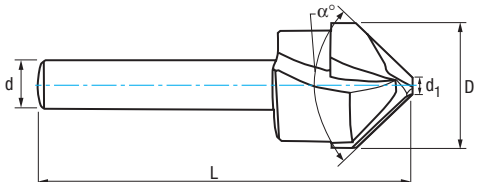
| Grupo Group-Groupe | Subgrup. | Grupo Group-Groupe | Grupo Group-Groupe | Subgrup. |
|---|---|---|---|---|
| P | P.1 P.2 | K | N | N.1 - N.2 N.3 - N.4 - N.5 |



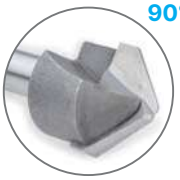
| D mm | Ang. | d mm | L mm | l mm | Z | N° Art. 8% Co | € |
|---|---|---|---|---|---|---|---|
| **16,00** | **45°** | 12 | 60 | 4,00 | 8 | 58737 | **69,55** |
| **20,00** | **45°** | 12 | 63 | 5,00 | 8 | 58764 | **78,23** |
| **25,00** | **45°** | 12 | 67 | 6,30 | 10 | 58791 | **87,94** |
| **32,00** | **45°** | 16 | 71 | 8,00 | 12 | 58818 | **100,00** |
| | | | | | | | |
| **16,00** | **60°** | 12 | 60 | 6,30 | 8 | 58746 | **69,55** |
| **20,00** | **60°** | 12 | 63 | 8,00 | 8 | 58773 | **78,23** |
| **25,00** | **60°** | 12 | 67 | 10,00 | 10 | 58800 | **87,94** |
| **32,00** | **60°** | 16 | 71 | 12,50 | 12 | 58827 | **100,00** |

# Ref. 9674

## FRESA RANURADO ALUCOBOND / DIBOND
Alucobond / Dibond Sheet Bending End Mill
Fraise rainurage Alucobond/Dibond



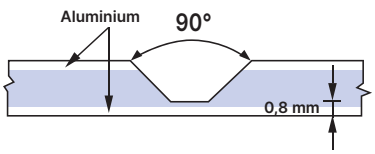

| MD HM Carbure | IZAR std. | | 12000-15000 rpm | Vf: 400-600 mm/min |
|---|---|---|---|---|

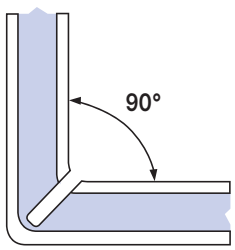



| D mm | d mm | L mm | $d_1$ mm | α ° | N° Art. MD/HM | € |
|---|---|---|---|---|---|---|
| | | | α=90° | | | |
| **16** | 8 | 59 | 2,5 | 90 | 81516 | **51,56** |
| **18** | 8 | 59 | 2,5 | 90 | 81519 | **52,29** |
| **20** | 8 | 59 | 2,5 | 90 | 81520 | **53,72** |

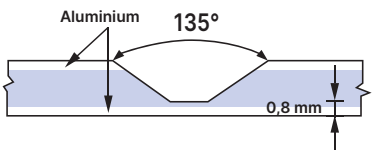
| D mm | d mm | L mm | $d_1$ mm | α ° | N° Art. MD/HM | € |
|---|---|---|---|---|---|---|
| | | | α=135° | | | |
| **16** | 8 | 59 | 2,3 | 135 | 81521 | **51,56** |
| **18** | 8 | 59 | 2,3 | 135 | 81522 | **52,29** |
| **20** | 8 | 59 | 2,3 | 135 | 81523 | **53,72** |

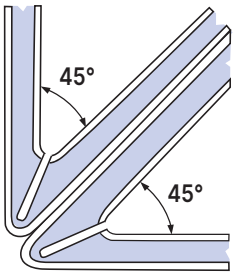
**90°**

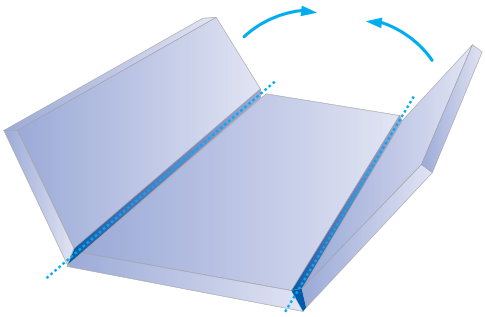



**135°**



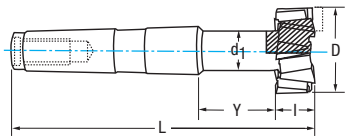
- **Fresa especial para ranurados en Alucobond, Dibond, Durabond, Alupanel, Plexiglas, Alpolic, ACP, ACM...**
- **Se recomienda cortar casi hasta el fondo para poder doblar las planchas fácilmente.**

- Special end mill for bending sheets of Alucobond, Dibond, Durabond, Alupanel, Plexiglas, Alpolic, ACP, ACM...
- The material should be cut almost until the bottom part leaving little amount of material left, that way the sheet will be bended easily.

- Fraise spécial pour rainurage sur Alucobond, Dibond, Durabond, Alupanel, Plexiglas, Alpolic, ACP, ACM...
- Il est recommandé de couper presque jusqu'au fond pour pouvoir plier les plaques facilement.

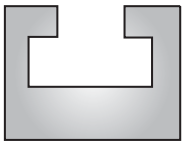
# Ref. 4810

## FRESA MANGO CÓNICO HSSE 8% CO RANURAS “T”
“T” Slots HSSE 8% Co Taper Shank Tool
Fraise queue conique HSSE 8% Co rainures à “T”




HSSE 8% Co | DIN 851 B N | ISO 1641 | 10° | Tol. D (d11) l (d11)

| Grupo Group-Groupe | Subgrup. | Grupo Group-Groupe | Grupo Group-Groupe | Subgrup. |
|---|---|---|---|---|
| **P** | **P.1 P.2** | **K** | **N** | **N.1 - N.2 N.3 - N.4 - N.5** |

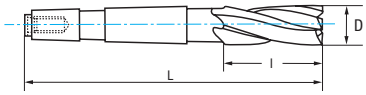


| D mm | l mm | L mm | CM | d1 mm | Y mm | Z | N° Art. 8% Co | € |
|---|---|---|---|---|---|---|---|---|
| **18,00** | **8** | 82 | 1 | 8 | 17,00 | 8 | 79164 | **113,76** |
| **21,00** | **9** | 102 | 2 | 10 | 24,00 | 8 | 79165 | **125,40** |
| **25,00** | **11** | 104 | 2 | 12 | 24,00 | 8 | 79166 | **129,99** |
| **32,00** | **14** | 111 | 2 | 15 | 28,00 | 10 | 79167 | **193,08** |
| **40,00** | **18** | 140 | 3 | 19 | 36,00 | 10 | 79168 | **254,45** |
| **50,00** | **22** | 187 | 4 | 25 | 46,00 | 10 | 79169 | **309,01** |
| *** 60,00** | **28** | 201 | 4 | 30 | 54,00 | 10 | 79170 | **446,47** |
| ***72,00** | **35** | 248 | 5 | 36 | 50,00 | 12 | 79171 | **581,56** |

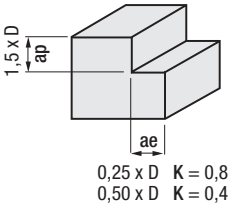
*** Art. bajo demanda / upon request /** sur demande

# Ref. 4675

## FRESA FRONTAL MANGO CÓNICO DESBASTE FINO HSSE 8% CO NZ
NZ HSSE 8% Co Fine Pitch Roughing Taper Shank End Mill
Fraise queue conique ébauche pas fin HSSE 8% Co NZ




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 845 B NR-F | ø≤25 | ø>25 | 4-6 Z | 30° | Tol. D (k12)




| Material | | Vc (m/min) | | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 | Ø 50 |
| P | P.2 | 25-35 | 30-40 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| K | K.1 | 20-30 | 24-35 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | K.2 | 15-20 | 18-24 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| S | | 15-20 | 18-24 | 0,067 | 0,080 | 0,110 | 0,130 | 0,130 | 0,130 | 0,130 |
| N | N.1 | 60-100 | 70-120 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.2 | 60-100 | 70-120 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

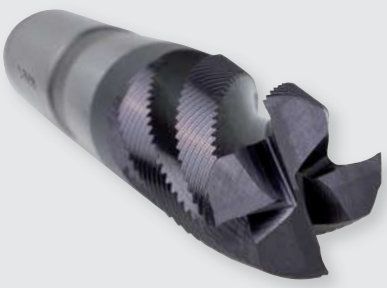
$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

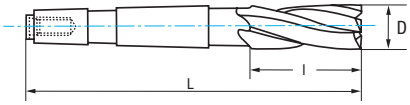
| D mm | L mm | l mm | CM | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **12,00** | 96 | 26 | 1 | 4 | 78137 | **90,06** | 78151 | **111,43** |
| **14,00** | 111 | 26 | 2 | 4 | 78156 | **90,06** | 79527 | **113,00** |
| **16,00** | 117 | 32 | 2 | 4 | 79528 | **96,01** | 79532 | **122,45** |
| **18,00** | 117 | 32 | 2 | 4 | 79533 | **102,50** | 79537 | **128,78** |
| **20,00** | 123 | 38 | 2 | 4 | 79538 | **110,26** | 79542 | **140,66** |
| **22,00** | 123 | 38 | 2 | 4 | 79543 | **157,05** | 79547 | **186,11** |
| **25,00** | 147 | 45 | 3 | 5 | 79548 | **153,29** | 79552 | **190,90** |
| **Ø > 25 mm sin Corte al Centro**<br>**Non Center Cutting /** Sans coupe au centre | | | | | | | | |
| **28,00** | 147 | 45 | 3 | 5 | 79553 | **172,92** | 79557 | **210,01** |
| **30,00** | 147 | 45 | 3 | 5 | 79558 | **193,83** | 79562 | **241,64** |
| **32,00** | 178 | 53 | 4 | 5 | 79563 | **267,35** | 79567 | **324,31** |
| **36,00** | 178 | 53 | 4 | 6 | 79568 | **305,38** | 79572 | **362,86** |
| **40,00** | 188 | 63 | 4 | 6 | 79573 | **370,49** | 79577 | **438,47** |
| **45,00** | 188 | 63 | 4 | 6 | 79578 | **451,82** | 79582 | **533,68** |
| **50,00** | 233 | 75 | 5 | 6 | 79583 | **535,61** | 79587 | **615,15** |

**TIALSIN bajo demanda / upon request** / sur demande

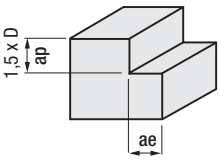


# Ref. 4570

## FRESA FRONTAL MANGO CÓNICO DESBASTE GRUESO HSSE 8% CO NZ
NZ HSSE 8% Co Coarse Roughing Taper Shank End Mill
Fraise queue conique ébauche HSSE 8% Co NZ




HSSE 8% Co | DIN 845 B NR | ISO 1641 | 4-8 Z | 30° | Tol. D (k12)




0,25 x D K = 1
0,50 x D K = 0,7

| Material | | Vc (m/min) | Refs. 4570-4580 - Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 | Ø 50 | Ø 63 |
| P | P.1 | 30-45 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| K | K.1 | 20-30 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | K.2 | 15-20 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.1 | 60-100 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.2 | 60-100 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

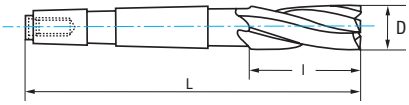
**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

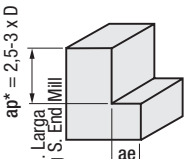
| D mm | L mm | l mm | CM | Z | N° Art. 8% Co | € | D mm | L mm | l mm | CM | Z | N° Art. 8% Co | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **10,00** | 92 | 22 | 1 | 4 | 45962 | **69,89** | **26,00** | 147 | 45 | 3 | 5 | 45989 | **170,00** |
| **12,00** | 96 | 26 | 1 | 4 | 45965 | **71,27** | **28,00** | 147 | 45 | 3 | 5 | 45992 | **170,00** |
| **14,00** | 111 | 26 | 2 | 4 | 45968 | **80,94** | **30,00** | 147 | 45 | 3 | 5 | 45995 | **199,53** |
| **15,00** | 111 | 26 | 2 | 4 | 67160 | **101,15** | **32,00** | 178 | 53 | 4 | 6 | 45998 | **248,38** |
| **16,00** | 117 | 32 | 2 | 4 | 45971 | **83,48** | **36,00** | 178 | 53 | 4 | 6 | 46001 | **273,83** |
| **18,00** | 117 | 32 | 2 | 4 | 45974 | **91,61** | **40,00** | 188 | 63 | 4 | 6 | 46004 | **382,49** |
| **20,00** | 123 | 38 | 2 | 4 | 45977 | **100,80** | **45,00** | 188 | 63 | 4 | 6 | 46007 | **414,45** |
| **22,00** | 123 | 38 | 2 | 5 | 45980 | **110,96** | **50,00** | 233 | 75 | 5 | 6 | 46010 | **461,10** |
| **24,00** | 147 | 45 | 3 | 5 | 45983 | **154,73** | **56,00** | 233 | 75 | 5 | 8 | 46013 | **625,86** |
| **25,00** | 147 | 45 | 3 | 5 | 45986 | **154,73** | **63,00** | 248 | 90 | 5 | 8 | 46016 | **786,08** |

# Ref. 4580

## FRESA FRONTAL MANGO CÓNICO DESBASTE GRUESO HSSE 8% CO NZ LARGA
Long NZ HSSE 8% Co Coarse Roughing Taper Shank End Mill
Fraise queue conique ébauche HSSE 8% Co NZ longue




HSSE 8% Co | DIN 845 B NR | ISO 1641 | 4-8 Z | 30° | Tol. D (k12)

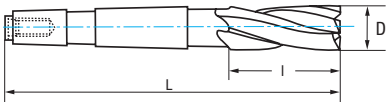



0,25 x D K = 0,5
0,50 x D K = 0,35

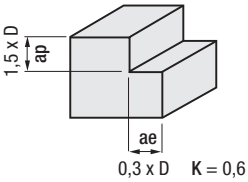
| D mm | L mm | l mm | CM | Z | N° Art. 8% Co | € | D mm | L mm | l mm | CM | Z | N° Art. 8% Co | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **10,00** | 115 | 45 | 1 | 4 | 67322 | **124,82** | **26,00** | 192 | 90 | 3 | 5 | 46124 | **243,30** |
| **12,00** | 123 | 53 | 1 | 4 | 67325 | **127,24** | **28,00** | 192 | 90 | 3 | 5 | 46127 | **243,30** |
| **14,00** | 138 | 53 | 2 | 4 | 67328 | **160,31** | **30,00** | 192 | 90 | 3 | 5 | 46130 | **288,04** |
| **15,00** | 138 | 53 | 2 | 4 | 67331 | **184,36** | **32,00** | 231 | 106 | 4 | 6 | 46133 | **343,03** |
| **16,00** | 148 | 63 | 2 | 4 | 46106 | **133,35** | **36,00** | 231 | 106 | 4 | 6 | 46136 | **392,88** |
| **18,00** | 148 | 63 | 2 | 4 | 46109 | **138,43** | **40,00** | 250 | 125 | 4 | 6 | 46139 | **483,47** |
| **20,00** | 160 | 75 | 2 | 4 | 46112 | **158,82** | **45,00** | 250 | 125 | 4 | 6 | 46142 | **615,84** |
| **22,00** | 160 | 75 | 2 | 5 | 46115 | **164,91** | **50,00** | 308 | 150 | 5 | 6 | 46145 | **768,52** |
| **24,00** | 192 | 90 | 3 | 5 | 46118 | **223,93** | **56,00** | 308 | 150 | 5 | 8 | 46148 | **895,56** |
| **25,00** | 192 | 90 | 3 | 5 | 46121 | **234,11** | **63,00** | 338 | 180 | 5 | 8 | 46151 | **1.127,46** |

# Ref. 4610

## FRESA FRONTAL MANGO CÓNICO ACABADO HSSE 8% CO NZ
NZ HSSE 8% Co Finishing Taper Shank End Mill
Fraise queue conique finition HSSE 8% Co NZ




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 845 B N | ISO 1641 | ø≤25 | ø>25 | | 30° | Tol. D (k10)




| Material | | Vc (m/min) | |
|---|---|---|---|
| Grupo | Sub. | 8% Co | TIALSIN |
| P | P.1 | 30-45 | 35-45 |
| | P.2 | 25-35 | 30-40 |
| K | K.1 | 20-30 | 24-35 |
| | K.2 | 15-20 | 18-24 |
| N | N.1 | 60-100 | 70-120 |
| | N.2 | 60-100 | 70-120 |

**Refs. 4610-4516 - Avances fz/rev. (mm/z) - Feed - Pas**

| Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 | Ø 50 | Ø 63 |
|---|---|---|---|---|---|---|---|---|
| 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$ | Vf (mm/min.) = r.p.m. x Z x fz x K | K = Coeficiente corrección / Correction coefficient - Coéficient correction

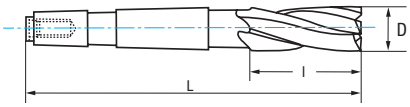
| D mm | L mm | l mm | CM | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| 10,00 | 92 | 22 | 1 | 4 | 60033 | 47,03 | 78013 | 67,35 |
| 12,00 | 96 | 26 | 1 | 4 | 60037 | 62,15 | 78014 | 84,27 |
| 14,00 | 111 | 26 | 2 | 4 | 60042 | 68,87 | 78015 | 92,44 |
| 15,00 | 111 | 26 | 2 | 4 | 60046 | 73,89 | 78016 | 100,97 |
| 16,00 | 117 | 32 | 2 | 4 | 60051 | 68,30 | 78017 | 95,52 |
| 18,00 | 117 | 32 | 2 | 4 | 60055 | 72,79 | 78018 | 99,90 |
| 20,00 | 123 | 38 | 2 | 4 | 60060 | 81,17 | 78019 | 112,33 |
| 22,00 | 123 | 38 | 2 | 6 | 60064 | 91,82 | 78020 | 122,69 |
| 24,00 | 147 | 45 | 3 | 6 | 60069 | 138,86 | 78021 | 170,47 |
| 25,00 | 147 | 45 | 3 | 6 | 60073 | 125,40 | 78022 | 163,79 |

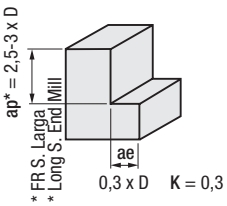
| D mm | L mm | l mm | CM | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| **Ø > 25 mm sin Corte al Centro** | | | | | | | | |
| **Non Center Cutting / Sans coupe au centre** | | | | | | | | |
| 26,00 | 147 | 45 | 3 | 6 | 60078 | 126,22 | 78023 | 164,56 |
| 28,00 | 147 | 45 | 3 | 6 | 60082 | 126,22 | 78024 | 164,56 |
| 30,00 | 147 | 45 | 3 | 6 | 60087 | 139,45 | 78025 | 188,84 |
| 32,00 | 178 | 53 | 4 | 6 | 60091 | 183,23 | 78026 | 242,49 |
| 36,00 | 178 | 53 | 4 | 6 | 60096 | 208,69 | 78027 | 268,88 |
| 40,00 | 188 | 63 | 4 | 8 | 60100 | 251,40 | 78028 | 322,71 |
| 45,00 | 188 | 63 | 4 | 8 | 60105 | 323,79 | 78029 | 409,21 |
| 50,00 | 233 | 75 | 5 | 8 | 60109 | 390,07 | 78030 | 473,66 |
| 56,00 | 233 | 75 | 5 | 8 | 60114 | 538,13 | 78031 | 617,61 |
| 63,00 | 248 | 90 | 5 | 8 | 60118 | 675,65 | 79125 | 751,28 |

**TIALSIN bajo demanda / upon request** / sur demande

# Ref. 4516

## FRESA FRONTAL MANGO CÓNICO ACABADO HSSE 8% CO NZ LARGA
Long NZ HSSE 8% Co Finishing Taper Shank End Mill
Fraise queue conique finition HSSE 8% Co NZ longue




HSSE 8% Co | HSSE 8% Co + TIALSIN | DIN 845 B N | ISO 1641 | | | 30° | Tol. D (k10)

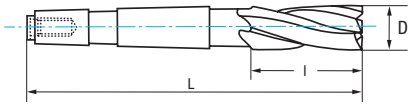
| D mm | L mm | l mm | CM | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| 10,00 | 115 | 45 | 1 | 4 | 45746 | 85,91 | 78165 | 107,41 |
| 12,00 | 123 | 53 | 1 | 4 | 45749 | 87,59 | 78166 | 110,83 |
| 14,00 | 138 | 53 | 2 | 4 | 45752 | 93,51 | 78167 | 118,32 |
| 15,00 | 138 | 53 | 2 | 4 | 45755 | 95,40 | 78168 | 123,75 |
| 16,00 | 148 | 63 | 2 | 4 | 45758 | 92,27 | 78169 | 120,61 |
| 18,00 | 148 | 63 | 2 | 4 | 45761 | 104,33 | 78170 | 132,69 |
| 20,00 | 160 | 75 | 2 | 4 | 45764 | 115,78 | 78171 | 148,32 |
| 22,00 | 160 | 75 | 2 | 6 | 45767 | 131,05 | 78172 | 163,58 |
| 24,00 | 192 | 90 | 3 | 6 | 45770 | 178,16 | 78173 | 212,72 |
| 25,00 | 192 | 90 | 3 | 6 | 45773 | 178,16 | 78174 | 218,89 |

| D mm | L mm | l mm | CM | Z | N° Art. 8% Co | € | N° Art. TIALSIN | € |
|---|---|---|---|---|---|---|---|---|
| 26,00 | 192 | 90 | 3 | 6 | 45776 | 195,96 | 78175 | 236,68 |
| 28,00 | 192 | 90 | 3 | 6 | 45779 | 209,94 | 78176 | 250,70 |
| 30,00 | 192 | 90 | 3 | 6 | 45782 | 229,03 | 78177 | 280,84 |
| 32,00 | 231 | 106 | 4 | 6 | 45785 | 269,74 | 78178 | 332,39 |
| 36,00 | 231 | 106 | 4 | 6 | 45788 | 309,20 | 78179 | 373,39 |
| 40,00 | 250 | 125 | 4 | 8 | 45791 | 343,56 | 78180 | 419,71 |
| 45,00 | 250 | 125 | 4 | 8 | 45794 | 467,22 | 78181 | 559,11 |
| 50,00 | 308 | 150 | 5 | 8 | 45797 | 564,92 | 78182 | 655,99 |
| 56,00 | 308 | 150 | 5 | 8 | 45800 | 594,31 | 78183 | 685,10 |
| 63,00 | 338 | 180 | 5 | 8 | 45803 | 786,08 | 78491 | 875,11 |

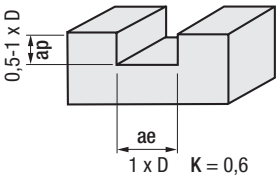
**TIALSIN bajo demanda / upon request** / sur demande

# Ref. 4550

## FRESA FRONTAL MANGO CÓNICO ACABADO HSSE 8% CO 2Z
2Z HSSE 8% Co Finishing Taper Shank End Mill
Fraise queue conique finition HSSE 8% Co 2Z




HSSE 8% Co | DIN 326 D N | 2 Z | 30° | Tol. D (e8)



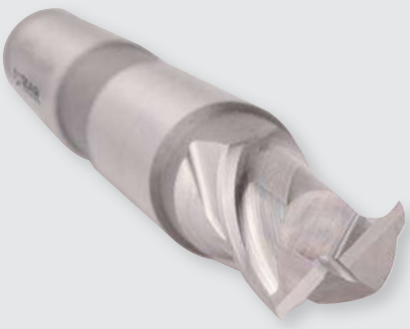

| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | 8% Co | Ø 10 | Ø 12 | Ø 16 | Ø 20 | Ø 25 | Ø 32 | Ø 40 |
| P | P.1 | 30-40 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | P.5 | 15-20 | 0,045 | 0,045 | 0,065 | 0,065 | 0,065 | 0,065 | 0,065 |
| M | | 15-20 | 0,045 | 0,045 | 0,065 | 0,065 | 0,065 | 0,065 | 0,065 |
| K | K.1 | 20-30 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | K.2 | 15-20 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| N | N.1 | 60-100 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.2 | 60-100 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |
| | N.3 | 160-200 | 0,067 | 0,080 | 0,100 | 0,130 | 0,130 | 0,130 | 0,130 |
| | N.4 | 160-200 | 0,067 | 0,080 | 0,100 | 0,130 | 0,130 | 0,130 | 0,130 |
| | N.5 | 50-80 | 0,050 | 0,060 | 0,100 | 0,100 | 0,100 | 0,100 | 0,100 |

$$\text{r.p.m.} = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K =** **Coeficiente corrección**
**Correction coefficient**
Coéficient correction

| D mm | L mm | l mm | CM | Z | N° Art. 8% Co | € |
|---|---|---|---|---|---|---|
| **10,00** | 83 | 13 | 1 | 2 | 79925 | **58,96** |
| **12,00** | 86 | 16 | 1 | 2 | 79928 | **61,02** |
| **14,00** | 101 | 16 | 2 | 2 | 79931 | **65,16** |
| **16,00** | 104 | 19 | 2 | 2 | 79934 | **72,05** |
| **18,00** | 104 | 19 | 2 | 2 | 79937 | **73,04** |
| **20,00** | 107 | 22 | 2 | 2 | 45920 | **76,37** |
| **22,00** | 107 | 22 | 2 | 2 | 79940 | **89,63** |
| **24,00** | 128 | 26 | 3 | 2 | 79943 | **119,54** |
| **25,00** | 128 | 26 | 3 | 2 | 79946 | **122,85** |
| **26,00** | 128 | 26 | 3 | 2 | 79949 | **128,41** |
| **28,00** | 128 | 26 | 3 | 2 | 79952 | **143,79** |
| **30,00** | 128 | 26 | 3 | 2 | 79955 | **159,78** |
| **32,00** | 157 | 32 | 4 | 2 | 79958 | **181,13** |
| **36,00** | 157 | 32 | 4 | 2 | 79961 | **220,16** |
| **40,00** | 163 | 38 | 4 | 2 | 79964 | **251,60** |

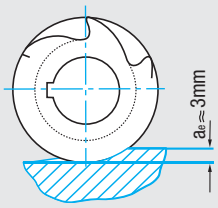


# TABLAS USO FRESAS AGUJERO
Milling Cutter Use Tables
Tableaux usage fraises à trou

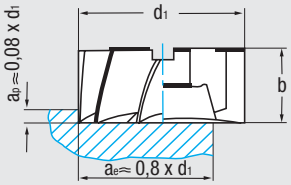
## FRESAS AGUJERO Milling Cutters Fraises à trou

## GRUPOS TRABAJO Working Groups Groupes travail

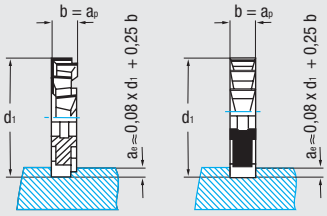
**Grupo 1: Fr. Planear**
**Plain Milling Cut.** Fraises à surfacer



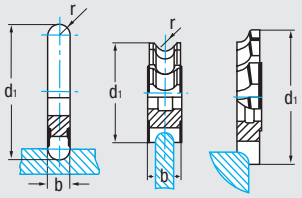

**Grupo 2: Fr. Cilíndricas Frontales**
**Shell End Mills** Fraises Cyllindriques frontales



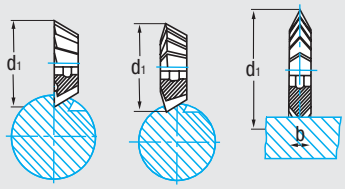

**Grupo 3: Fresas Fresadas Agujero**
**Side & Face Milling Cutters** Fraises à trou




**Grupo 4: Convexas y Cóncavas**
**Convex & Concave Half Circle** Fraises convexes et concaves demi-cercle




**Grupo 5: Cónicas Frontales e Isósceles**
**Angular & Double Angle** Fraises coniques frontales et isocèle

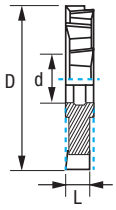



| Material | | | | Velocidad Corte Cutting Speed Vitesse de coupe (m/min.) | | | Avance (disminuir hasta 0,35 x fz al incrementar ap) Feed (reduce up to 0,35 x fz when growing ap) Avance : Réduire jusqu´à 0.35 x fz si augmente ap (fz/rev.) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | HSS | HSSE 5% Co | PMX | Grupo 1 | Grupo 2 | Grupo 3 | Grupo 4 | Grupo 5 |
| P | | P.1 | <850 N/mm² | 17-25 | 24-35 | 31-41 | 0,18 | 0,15 | 0,06 | 0,04 | 0,06 |
| | | P.2 | < 1000 N/mm² | 13-17 | 18-24 | 23-30 | 0,15 | 0,12 | 0,07 | 0,04 | 0,04 |
| | | P.3 | 1000-1300 N/mm² | 10-13 | 14-19 | 18-24 | 0,10 | 0,08 | 0,04 | 0,04 | 0,03 |
| | | P.5 | MARTENSÍTICO Martensitic Martensitique | 13-17 | 18-24 | 23-30 | 10-14 | 14-20 | 18-24 | 0,04 | 0,03 |
| M | INOX AUSTENÍTICO Austenitic Stainless Steel Aciers Inox austénitique | | | 13-17 | 18-24 | 23-30 | 0,12 | 0,10 | 0,08 | 0,06 | 0,03 |
| K | FUNDICIÓN Cast Iron Fonte | K.1 | < 700 N/mm² | 10-14 | 14-20 | 18-24 | 0,25 | 0,22 | 0,08 | 0,08 | 0,01 |
| | | K.2 | 700-1000 N/mm² | 10-14 | 14-20 | 18-24 | 21-27 | 30-38 | 39-51 | 0,06 | 0,06 |
| S | ALEACIONES TERMORRESISTENTES Heat-Resistant Alloys Alliages résistants à la chaleur | | | 17-24 | 24-35 | 31-41 | 0,13 | 0,11 | 0,07 | 0,05 | 0,04 |
| N | Cu - BRONCE - LATÓN Copper - Bronze - Brass Cuivre - Bronze - Laiton | N.1 | VIRUTA CORTA Short Chip Copeaux courts | 21-27 | 30-38 | 39-51 | 0,20 | 0,15 | 0,10 | 0,08 | 0,05 |
| | | N.2 | VIRUTA LARGA Long Chip Copeaux longs | 49-84 | 70-120 | 91-183 | 0,25 | 0,20 | 0,10 | 0,08 | 0,08 |
| | ALUMINIO - MAGNESIO Aluminium - Magnesium | N.3 | NO ALEADO Unalloyed Sans alliage | 147-210 | 210-300 | 273-355 | 0,20 | 0,15 | 0,07 | 0,05 | 0,07 |
| | | N.4 | < 10% Si | 147-210 | 210-300 | 273-355 | 0,20 | 0,15 | 0,07 | 0,05 | 0,07 |
| | | N.5 | > 10% Si | 42-49 | 60-70 | 78-101 | 0,12 | 0,10 | 0,07 | 0,04 | 0,06 |
| | | N.6 | TERMOPLÁSTICOS Thermoplastics Thermoplastiques | 84-126 | 120-180 | 156-203 | 0,16 | 0,12 | 0,06 | 0,05 | 0,06 |
| | | N.7 | DUROPLÁSTICOS Hard-Plastics Plastiques durs | | | | | | | | |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times \varnothing}$$

# Ref. 4120

## FRESA 3 CORTES HSSE 5% CO DENTADO CRUZADO
Staggered Teeth HSSE 5% Co Side & Face Milling Cutter
Fraise 3 tailles HSSE 5% Co denture alternée




HSSE 5% Co | DIN 885 A | ISO 2587 | Tol. ø (js16) d (H7) L (k11)

**Mejor Desalojo Viruta**
**Better Chip Off**
Meilleure évacuation copeaux

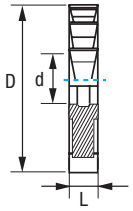
| D mm | L mm | d mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **50** | **4** | **16** | 12 | 52584 | **80,55** |
| | 5 | | 12 | 52587 | **80,55** |
| | 6 | | 12 | 52590 | **93,36** |
| | 8 | | 12 | 52593 | **90,92** |
| | 10 | | 12 | 52596 | **100,11** |
| **63** | **4** | **22** | 12 | 52611 | **93,37** |
| | 5 | | 12 | 52614 | **93,37** |
| | 6 | | 12 | 52620 | **95,11** |
| | 8 | | 12 | 52623 | **103,39** |
| | 10 | | 12 | 52626 | **111,23** |
| | 12 | | 12 | 52629 | **119,15** |
| | 14 | | 12 | 52632 | **128,33** |
| | 16 | | 12 | 52635 | **134,82** |
| | 18 | | 12 | 52638 | **162,12** |
| **80** | **5** | **27** | 14 | 52644 | **126,25** |
| | 6 | | 14 | 52647 | **129,56** |
| | 8 | | 14 | 52650 | **136,73** |
| | 10 | | 14 | 52653 | **145,95** |
| | 12 | | 14 | 52656 | **156,29** |
| | 14 | | 14 | 52659 | **167,11** |
| | 16 | | 14 | 52662 | **171,48** |
| | 18 | | 14 | 52665 | **183,97** |
| | 20 | | 14 | 52668 | **202,27** |
| **100** | **6** | **32** | 14 | 52674 | **177,47** |
| | 8 | | 14 | 52677 | **181,24** |
| | 10 | | 14 | 52680 | **187,89** |
| | 12 | | 14 | 52683 | **202,37** |
| | 14 | | 14 | 52686 | **222,78** |
| | 16 | | 14 | 52689 | **236,05** |
| | 18 | | 14 | 52692 | **258,38** |
| | 20 | | 14 | 52698 | **258,38** |
| | 22 | | 14 | 52701 | **288,81** |
| | 25 | | 14 | 52707 | **315,11** |

| D mm | L mm | d mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **125** | **8** | **32** | 16 | 52725 | **279,94** |
| | 10 | | 16 | 52728 | **287,23** |
| | 12 | | 16 | 52731 | **298,14** |
| | 14 | | 16 | 52734 | **323,76** |
| | 16 | | 16 | 52737 | **343,78** |
| | 18 | | 16 | 52740 | **363,77** |
| | 20 | | 16 | 52743 | **387,01** |
| | 22 | | 16 | 52746 | **440,68** |
| | 25 | | 16 | 52749 | **444,95** |
| | 28 | | 16 | 52752 | **486,32** |
| **160** | **10** | **40** | 18 | 52758 | **464,12** |
| | 12 | | 18 | 52761 | **464,12** |
| | 14 | | 18 | 52764 | **461,87** |
| | 16 | | 18 | 52767 | **505,49** |
| | 18 | | 18 | 52770 | **532,61** |
| | 20 | | 18 | 52773 | **546,75** |
| | 22 | | 18 | 52776 | **600,93** |
| | 25 | | 18 | 52779 | **651,18** |
| | 28 | | 18 | 52782 | **715,81** |
| | 32 | | 18 | 52785 | **765,33** |
| **200** | **12** | **40** | 24 | 52788 | **708,03** |
| | 14 | | 24 | 52791 | **714,94** |
| | 16 | | 24 | 52794 | **736,57** |
| | 18 | | 24 | 52797 | **772,81** |
| | 20 | | 24 | 52800 | **826,50** |
| | 22 | | 24 | 52803 | **829,26** |
| | 25 | | 24 | 52806 | **961,89** |
| | 28 | | 24 | 52809 | **992,28** |
| | 32 | | 24 | 52812 | **1.237,56** |

**>125 mm bajo demanda / upon request** / sur demande

# Ref. 4130

## FRESA 3 CORTES HSSE 5% CO DENTADO RECTO
Straight Teeth HSSE 5% Co Side & Face Milling Cutter
Fraise 3 tailles HSSE 5% Co denture droite




HSSE 5% Co | DIN 885 B | ISO 2587 | Tol. ø (js16) d (H7) L (k11) | **Materiales Tenaces Tough Materials** Matériaux tenaces

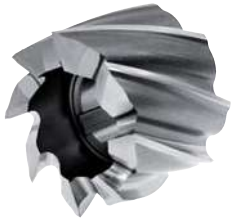
| D mm | L mm | d mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **50** | **4** | **16** | 16 | 52815 | **80,55** |
| | 5 | | 16 | 52818 | **80,55** |
| | 6 | | 16 | 52821 | **93,36** |
| | 8 | | 16 | 52827 | **90,92** |
| | 10 | | 16 | 52833 | **100,11** |
| **63** | **4** | **22** | 18 | 52860 | **93,37** |
| | 5 | | 18 | 52863 | **93,37** |
| | 6 | | 18 | 52866 | **95,11** |
| | 8 | | 18 | 52872 | **103,39** |
| | 10 | | 18 | 52878 | **111,23** |
| | 12 | | 18 | 52881 | **119,15** |
| | 14 | | 18 | 52884 | **128,33** |
| | 16 | | 18 | 52887 | **134,82** |
| | 18 | | 18 | 52893 | **162,12** |
| **80** | **5** | **27** | 20 | 52932 | **126,25** |
| | 6 | | 20 | 52935 | **129,56** |
| | 8 | | 20 | 52938 | **136,73** |
| | 10 | | 20 | 52944 | **145,95** |
| | 12 | | 20 | 52947 | **156,29** |
| | 14 | | 20 | 52950 | **167,11** |
| | 16 | | 20 | 52953 | **171,48** |
| | 18 | | 20 | 52959 | **183,97** |
| | 20 | | 20 | 52962 | **202,27** |
| **100** | **6** | **32** | 24 | 52992 | **177,47** |
| | 8 | | 24 | 53004 | **181,24** |
| | 10 | | 24 | 53010 | **187,89** |
| | 12 | | 24 | 53016 | **202,37** |
| | 14 | | 24 | 53019 | **222,78** |
| | 16 | | 24 | 53022 | **236,05** |
| | 18 | | 24 | 53025 | **258,38** |
| | 20 | | 24 | 53028 | **258,38** |
| | 22 | | 24 | 53031 | **288,81** |
| | 25 | | 24 | 53034 | **315,11** |

| D mm | L mm | d mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **125** | **8** | **32** | 24 | 53049 | **279,94** |
| | 10 | | 24 | 53052 | **287,23** |
| | 12 | | 24 | 53055 | **298,14** |
| | 14 | | 24 | 53058 | **323,76** |
| | 16 | | 24 | 53061 | **343,78** |
| | 18 | | 24 | 53064 | **363,77** |
| | 20 | | 24 | 53067 | **387,01** |
| | 22 | | 24 | 53070 | **440,68** |
| | 25 | | 24 | 53076 | **444,95** |
| | 28 | | 24 | 53079 | **486,32** |
| **160** | **10** | **40** | 24 | 53103 | **464,12** |
| | 12 | | 24 | 53106 | **464,12** |
| | 14 | | 24 | 53109 | **461,87** |
| | 16 | | 24 | 53112 | **505,49** |
| | 18 | | 24 | 53115 | **532,61** |
| | 20 | | 24 | 53118 | **546,75** |
| | 22 | | 24 | 53121 | **600,93** |
| | 25 | | 24 | 53124 | **651,18** |
| | 28 | | 24 | 53127 | **715,81** |
| | 32 | | 24 | 53130 | **765,33** |
| **200** | **12** | **40** | 32 | 53136 | **708,03** |
| | 14 | | 32 | 53139 | **714,94** |
| | 16 | | 32 | 53142 | **736,57** |
| | 18 | | 32 | 53145 | **772,81** |
| | 20 | | 32 | 53148 | **826,50** |
| | *22 | | 32 | 53151 | **829,26** |
| | *25 | | 32 | 53154 | **961,89** |
| | *28 | | 32 | 53157 | **992,28** |
| | *32 | | 32 | 53160 | **1.237,56** |

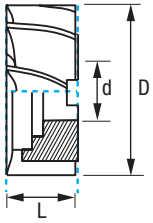
**>125 mm bajo demanda / upon request** / sur demande

# Ref. 6040

## FRESA FRONTAL AGUJERO PMX ACABADO
Finishing PMX Milling Cutter
Fraise à trou PMX finition



PMX | PMX + TIALN-TOP | DIN 1880 N | ISO 2586 | 30° | Tol. ø (js16) d (H7) L (K16)



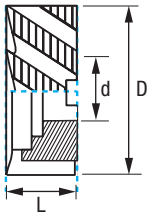

| D mm | L mm | d mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|
| **40** | **32** | **16** | 6 | 39013 | **146,11** | 39018 | **201,77** |
| **50** | **36** | **22** | 8 | 39014 | **198,34** | 39019 | **274,02** |
| **63** | **40** | **27** | 8 | 39015 | **282,95** | 39020 | **368,34** |
| **80** | **45** | **27** | 8 | 39016 | **425,40** | 39022 | **544,18** |
| **100** | **50** | **32** | 12 | 39017 | **645,84** | 39023 | **826,11** |

**Ref. 6040 bajo demanda / upon request** / sur demande

# Ref. 6080

## FRESA FRONTAL AGUJERO PMX DESBASTE GRUESO
Coarse Roughing PMX Milling Cutter
Fraise à trou PMX ébauche

PMX | PMX + TIALN-TOP | DIN 1880 NR | ISO 2586 | 30° | Tol. ø (js16) d (H7) L (K16)



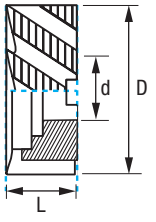

| D mm | L mm | d mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|
| **40** | **32** | **16** | 6 | 39032 | **190,81** | 39027 | **246,46** |
| **50** | **36** | **22** | 6 | 39033 | **258,05** | 39028 | **333,69** |
| **63** | **40** | **27** | 8 | 39034 | **350,75** | 39029 | **436,15** |
| **80** | **45** | **27** | 10 | 39035 | **518,73** | 39030 | **637,50** |
| **100** | **50** | **32** | 10 | 39036 | **857,96** | 39031 | **1.038,24** |

**Ref. 6080 bajo demanda / upon request** / sur demande

# Ref. 6090

## FRESA FRONTAL AGUJERO PMX DESBASTE MEDIO
Roughing & Finishing PMX Milling Cutter
Fraise à trou PMX semi-finition

PMX | PMX + TIALN-TOP | DIN 1880 NF | ISO 2586 | 30° | Tol. ø (js16) d (H7) L (K16)



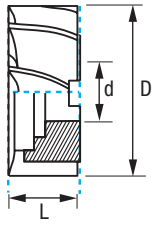

| D mm | L mm | d mm | Z | N° Art. PMX | € | N° Art TIALN-TOP | € |
|---|---|---|---|---|---|---|---|
| **40** | **32** | **16** | 6 | 39062 | **190,81** | 39056 | **246,46** |
| **50** | **36** | **22** | 6 | 39063 | **258,05** | 39058 | **333,69** |
| **63** | **40** | **27** | 8 | 39064 | **350,75** | 39059 | **436,15** |
| **80** | **45** | **27** | 8 | 39065 | **518,73** | 39060 | **637,50** |
| **100** | **50** | **32** | 10 | 39066 | **822,46** | 39061 | **1.038,24** |

**Ref. 6090 bajo demanda / upon request** / sur demande

# Ref. 4040

## FRESA FRONTAL AGUJERO HSSE 5% CO ACABADO
Finishing HSSE 5% Co Milling Cutter
Fraise à trou HSSE 5% Co finition

HSSE 5% Co | DIN 1880 N | ISO 2586 | 30° | Tol. ø (js16) d (H7) L (K16)



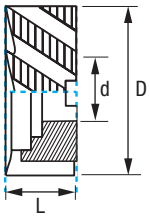

| D mm | L mm | d mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **40** | **32** | **16** | 6 | 55557 | **108,96** |
| **50** | **36** | **22** | 8 | 55575 | **149,92** |
| **63** | **40** | **27** | 8 | 55593 | **204,83** |
| **80** | **45** | **27** | 10 | 55611 | **290,05** |
| **100** | **50** | **32** | 10 | 55647 | **467,03** |
| **125** | **56** | **40** | 14 | 55665 | **749,99** |
| ***160** | **63** | **50** | 16 | 55674 | **1.340,39** |

*** Ø > 125 mm bajo demanda / upon request /** sur demande

# Ref. 4080

## FRESA FRONTAL AGUJERO HSSE 5% CO DESBASTE GRUESO
Coarse Roughing HSSE 5% Co Milling Cutter
Fraise à trou HSSE 5% Co ébauche

HSSE 5% Co | DIN 1880 NR | ISO 2586 | 30° | Tol. ø (js16) d (H7) L (K16)



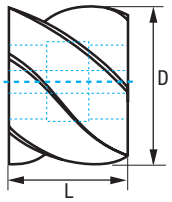

| D mm | L mm | d mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **40** | **32** | **16** | 6 | 77752 | **157,95** |
| **50** | **36** | **22** | 6 | 77754 | **196,14** |
| **63** | **40** | **27** | 8 | 77755 | **259,99** |
| **80** | **45** | **27** | 8 | 42863 | **381,81** |
| **100** | **50** | **32** | 10 | 42866 | **629,97** |
| ***125** | **56** | **40** | 12 | 42869 | **1.068,72** |
| ***160** | **63** | **50** | 14 | 42872 | **1.854,42** |

*** Ø > 100 mm bajo demanda / upon request /** sur demande

# Ref. 4010

## FRESA DE PLANEAR HSSE 5% CO
Plain HSSE 5% Co Shell End Mill
Fraise surfacer HSSE 5% Co

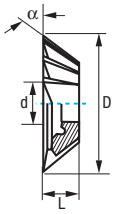
HSSE 5% Co | DIN 884 N | ISO 2584 | 30° | Tol. ø (js16) d (H7) L (js16)




| D mm | L mm | d mm | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|
| **50** | **40** | **22** | 8 | 53952 | **128,07** |
| **50** | **63** | **22** | 8 | 53961 | **136,49** |
| **50** | **80** | **22** | 8 | 53970 | **203,45** |
| **63** | **50** | **27** | 8 | 54015 | **179,11** |
| **63** | **70** | **27** | 8 | 54024 | **217,93** |
| **80** | **63** | **32** | 8 | 54096 | **301,86** |
| **80** | **100** | **32** | 8 | 54123 | **443,77** |
| **100** | **70** | **40** | 10 | 54141 | **469,66** |

# Ref. 4300

## FRESA FRONTAL CÓNICA HSSE 5% CO
Single Angle HSSE 5% Co Milling Cutter
Fraise conique 2 tailles HSSE 5% Co




HSSE 5% Co | DIN 842 | Tol. ø (js16) d (H7) L (js14)

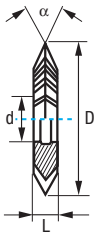
| | D mm | L mm | d mm | Ang. | Z | N° Art. 5% Co | | € |
|---|---|---|---|---|---|---|---|---|
| ± 25´ | 40 | 13 | 10 | 50° | 14 | 54177 | | 115,05 |
| | 50 | 16 | 13 | 50° | 16 | 54195 | | 141,86 |
| | 63 | 20 | 16 | 50° | 18 | 54213 | | 179,31 |
| ± 20´ | 80 | 25 | 22 | 50° | 20 | 54231 | | 258,34 |
| | 100 | 32 | 27 | 50° | 22 | 54249 | | 374,67 |
| | 125 | 40 | 32 | 50° | 24 | 54267 | * | 618,72 |
| | 160 | 50 | 40 | 50° | 28 | 54285 | * | 1.082,30 |
| ± 25´ | 40 | 13 | 10 | 60° | 14 | 54186 | | 115,05 |
| | 50 | 16 | 13 | 60° | 16 | 54204 | | 141,86 |
| | 63 | 20 | 16 | 60° | 16 | 54222 | | 179,31 |
| ± 20´ | 80 | 25 | 22 | 60° | 18 | 54240 | | 258,34 |
| | 100 | 32 | 27 | 60° | 20 | 54258 | | 374,67 |
| | 125 | 40 | 32 | 60° | 26 | 54276 | * | 618,72 |
| | 160 | 50 | 40 | 60° | 28 | 54294 | * | 1.082,30 |

**45° & 55° bajo demanda**
**upon request** / sur demande

*** HSS**

# Ref. 4352

## FRESA ANGULAR ISÓSCELES HSSE 5% CO
Double Angle HSSE 5% Co Milling Cutter
Fraise isosceles 2 tailles HSSE 5% Co



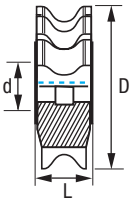

HSSE 5% Co | DIN 847 | ISO 6108 | Tol. ø (js16) d (H7) L (js16) | α ±30´

| D mm | L mm | d mm | Ang. | Z | N° Art. 5% Co | € |
|---|---|---|---|---|---|---|
| 50 | 8 | 16 | 45° | 16 | 53736 | 148,34 |
| 63 | 10 | 22 | 45° | 16 | 53790 | 176,47 |
| 80 | 12 | 27 | 45° | 20 | 53835 | 246,39 |
| 100 | 18 | 32 | 45° | 20 | 53871 | 308,03 |
| 50 | 10 | 16 | 60° | 16 | 53745 | 148,34 |
| 63 | 14 | 22 | 60° | 16 | 53808 | 176,47 |
| 80 | 18 | 27 | 60° | 18 | 53853 | 246,39 |
| 100 | 25 | 32 | 60° | 20 | 53880 | 308,03 |
| 50 | 14 | 16 | 90° | 16 | 53754 | 148,34 |
| 63 | 20 | 22 | 90° | 16 | 53826 | 176,47 |
| 80 | 22 | 27 | 90° | 18 | 53862 | 246,39 |
| 100 | 32 | 32 | 90° | 20 | 53889 | 308,03 |

# Ref. 5050

## FRESA CÓNCAVA HSSE 5% CO
Concave Half Circle HSSE 5% Co Cutter
Fraise à demi-cercle concave HSSE 5% Co

HSSE 5% Co | DIN 855 | Tol. ø (js16) d (H7) R (H11)




| R | D mm | L mm | d mm | Z | N° Art. 5% Co | | € |
|---|---|---|---|---|---|---|---|
| **1,50** | 50 | 8 | 16 | 14 | 54501 | | **150,88** |
| **1,60** | 50 | 8 | 16 | 14 | 54510 | * | **150,88** |
| **2,00** | 50 | 9 | 16 | 14 | 54519 | | **150,88** |
| **2,50** | 63 | 10 | 22 | 14 | 54528 | | **154,45** |
| **3,00** | 63 | 12 | 22 | 12 | 54537 | | **192,27** |
| **3,50** | 63 | 16 | 22 | 12 | 54546 | * | **198,11** |
| **4,00** | 63 | 16 | 22 | 12 | 54555 | | **201,07** |
| **5,00** | 63 | 20 | 22 | 10 | 54564 | | **208,78** |
| **6,00** | 80 | 24 | 27 | 10 | 54582 | | **259,80** |
| **7,00** | 80 | 24 | 27 | 12 | 54591 | * | **278,15** |
| **8,00** | 80 | 32 | 27 | 10 | 54600 | | **360,36** |
| **9,00** | 100 | 36 | 32 | 10 | 54609 | | **433,42** |
| **10,00** | 100 | 36 | 32 | 10 | 54618 | | **456,14** |
| **11,00** | 100 | 40 | 32 | 10 | 54627 | | **542,20** |
| **12,00** | 100 | 40 | 32 | 10 | 54636 | | **573,96** |
| **12,50** | 100 | 40 | 32 | 12 | 54645 | * | **566,94** |
| **14,00** | 100 | 50 | 32 | 10 | 54654 | * | **604,33** |

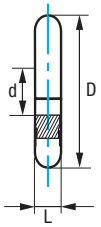
**R > 12,50 mm bajo demanda**
**upon request /** sur demande

*** HSS**

# Ref. 5040

## FRESA CONVEXA HSSE 5% CO
Convex Half Circle HSSE 5% Co Cutter
Fraise à demi-cercle convexe HSSE 5% Co

HSSE 5% Co | DIN 856 | Tol. ø (js16) d (H7) R (h11)




| R | D mm | L mm | d mm | Z | N° Art. 5% Co | | € |
|---|---|---|---|---|---|---|---|
| **1,50** | 50 | 3,00 | 16 | 14 | 77802 | | **121,94** |
| **1,60** | 50 | 3,20 | 16 | 14 | 54312 | * | **121,94** |
| **2,00** | 50 | 4,00 | 16 | 16 | 54321 | | **121,94** |
| **2,50** | 63 | 5,00 | 22 | 12 | 54330 | | **126,64** |
| **3,00** | 63 | 6,00 | 22 | 12 | 54339 | | **127,85** |
| **3,50** | 63 | 7,00 | 22 | 12 | 54348 | | **164,16** |
| **4,00** | 63 | 8,00 | 22 | 12 | 54357 | | **164,16** |
| **5,00** | 63 | 10,00 | 22 | 12 | 54375 | | **172,62** |
| **6,00** | 80 | 12,00 | 27 | 12 | 54393 | | **204,69** |
| **7,00** | 80 | 14,00 | 27 | 12 | 54411 | | **217,52** |
| **8,00** | 80 | 16,00 | 27 | 12 | 54420 | | **217,52** |
| **9,00** | 100 | 18,00 | 32 | 12 | 54429 | | **310,91** |
| **10,00** | 100 | 20,00 | 32 | 12 | 54447 | | **310,91** |
| **11,00** | 100 | 22,00 | 32 | 12 | 77803 | * | **351,43** |
| **12,00** | 100 | 24,00 | 32 | 12 | 54456 | | **351,43** |
| **12,50** | 100 | 25,00 | 32 | 12 | 77804 | * | **495,48** |
| **14,00** | 125 | 28,00 | 32 | 12 | 77805 | * | **495,48** |
| **16,00** | 125 | 32,00 | 32 | 12 | 54465 | * | **495,48** |
| **18,00** | 125 | 36,00 | 32 | 12 | 54474 | * | **529,40** |
| **20,00** | 125 | 40,00 | 32 | 12 | 54483 | * | **802,64** |

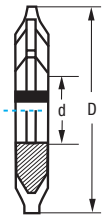
**R > 14 mm bajo demanda**
**upon request /** sur demande

*** HSS**

# Ref. 5100

## FRESA TALLADO ENGRANAJES HSS MODULAR
Modular Involute Gear HSS Cutter
Fraise à tailler les engranages HSS modulaire

HSS | Modular | Form Relieved | Tol. ø (js16) d (H7) | Ang. Presión β 20°




| Mod. | D mm | d mm | N° Cortes Cuts Coupes | € |
|---|---|---|---|---|
| **0,50** | 40 | 16 | 14 | **103,72** |
| **0,75** | 40 | 16 | 12 | **103,72** |
| **1,00** | 50 | 16 | 12 | **103,72** |
| **1,25** | 50 | 16 | 12 | **103,72** |
| **1,50** | 60 | 22 | 12 | **103,72** |
| **1,75** | 60 | 22 | 12 | **103,72** |
| **2,00** | 60 | 22 | 12 | **103,72** |
| **2,25** | 60 | 22 | 12 | **121,56** |
| **2,50** | 65 | 22 | 12 | **121,56** |
| **2,75** | 70 | 27 | 12 | **121,56** |
| **3,00** | 70 | 27 | 12 | **121,56** |
| **3,25** | 75 | 27 | 12 | **160,42** |

| Mod. | D mm | d mm | N° Cortes Cuts Coupes | € |
|---|---|---|---|---|
| **3,50** | 75 | 27 | 12 | **160,42** |
| **3,75** | 80 | 27 | 12 | **160,42** |
| **4,00** | 80 | 27 | 12 | **160,42** |
| **4,50** | 85 | 27 | 11 | **219,88** |
| **5,00** | 90 | 32 | 11 | **219,88** |
| **5,50** | 95 | 32 | 11 | **278,41** |
| **6,00** | 100 | 32 | 11 | **278,41** |
| **6,50** | 105 | 32 | 10 | **320,07** |
| **7,00** | 105 | 32 | 10 | **320,07** |
| **8,00** | 110 | 32 | 9 | **364,29** |
| **9,00** | 115 | 32 | 9 | **517,25** |
| **10,00** | 120 | 32 | 9 | **555,39** |

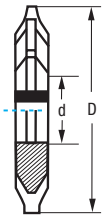
| Mod. | D mm | d mm | N° Cortes Cuts Coupes | € |
|---|---|---|---|---|
| **11,00** | 135 | 40 | 9 | |
| **12,00** | 145 | 40 | 9 | |
| **13,00** | 155 | 40 | 9 | |
| **14,00** | 160 | 40 | 9 | |
| **15,00** | 165 | 40 | 9 | |
| **16,00** | 170 | 40 | 9 | |
| **18,00** | 190 | 50 | 9 | |
| **20,00** | 205 | 50 | 9 | |

*** Precio por N°** / **Price per Nr** / Prix pour N°
**> Mod. 10 bajo demanda**
**upon request** / sur demande

# Ref. 5120

## FRESA TALLADO ENGRANAJES HSS DIAMETRAL PITCH
Diametral Pitch Involute Gear HSS Cutter
Fraise à tailler les engranages HSS Diametral Pitch

HSS | Diametral Pitch | Tol. ø (js16) d (H7) | Ang. Presión β 20° | **Bajo Demanda Upon request** Sur demande




# Refs. 5100-5120

## JUEGOS DE FRESAS PARA TALLADO DE ENGRANAJES CILÍNDRICOS
**Gear Cutter Sets for Gear Profile Sharpening** - Jeux de fraises pour taillage d´engrenages cyllindriques

**SISTEMA MODULAR (REF. 5100)**
**Form Relieved** Système modulaire

**Juego Normal de 8 Fresas para Módulos 1-10**
**8 Gear Cutter Usual Set for 1-10 Modules** Jeu normal 8 fraises module 1 à 10

| **N° Fresa Cutter N°** Numéro de fraise | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| **Dientes a Tallar Teeth to Sharp** Dents à tailler | 12-13 | 14-16 | 17-20 | 21-25 | 26-34 | 35-54 | 55-134 | 135-∞ |

**Juego de 15 Fresas para Módulos >10**
**15 Gear Cutter Set for >10 Modules** Jeux de 15 fraises pour Modules > 10

| **N° Fresa Cutter N°** Numéro de fraise | 1 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 4 1/2 |
|---|---|---|---|---|---|---|---|---|
| **Dientes a Tallar Teeth to Sharp** Dents à tailler | 12 | 13 | 14 | 15-16 | 17-18 | 19-20 | 21-22 | 23-25 |
| **N° Fresa Cutter N°** Numéro de fraise | 5 | 5 1/2 | 6 | 6 1/2 | 7 | 7 1/2 | 8 | |
| **Dientes a Tallar Teeth to Sharp** Dents à tailler | 26-29 | 30-34 | 35-41 | 42-54 | 55-79 | 80-134 | 135-∞ | |

**SISTEMA DIAMETRAL PITCH (REF. 5120)**
**Form Relieved Diametral Pitch** Système diamètral pitch

**Serie de 15 Fresas**
**15 Gear Cutter Series** Série 15 fraises

| **N° Fresa Cutter N°** Numéro de fraise | 1 | 1 1/2 | 2 | 2 1/2 | 3 | 3 1/2 | 4 | 4 1/2 |
|---|---|---|---|---|---|---|---|---|
| **Dientes a Tallar Teeth to Sharp** Dents à tailler | 135-∞ | 80-134 | 55-134 | 42-54 | 35-54 | 30-34 | 26-34 | 23-25 |
| **N° Fresa Cutter N°** Numéro de fraise | 5 | 5 1/2 | 6 | 6 1/2 | 7 | 7 1/2 | 8 | |
| **Dientes a Tallar Teeth to Sharp** Dents à tailler | 21-25 | 19-20 | 17-20 | 15-16 | 14-16 | 13 | 12-13 | |

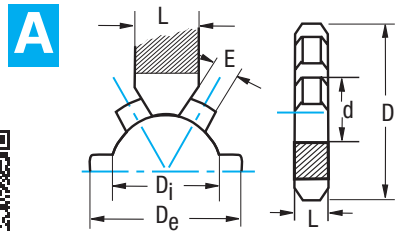
OBSERVACIONES: El perfil de la fresa de disco corresponde siempre al n° inferior de dientes. El n° 8 de fresa puede servir para el tallado de las cremalleras, pero en casos que requieran gran exactitud se recomienda el uso de fresas especiales de flancos totalmente rectos.

COMMENTS: Gear cutter profile always corresponds to teeth inferior n°. Cutter´s n° 8 could be used to sharp racks, but when high precision is needed totally straight flanks special cutters use is advised.

OBSERVATIONS: Le profil de la fraise disque correspond toujours au numéro inférieur de dents. Le n° 8 peut servir pour tailler les cremaillères, mais dans des cas qui ont besoin de forte précision on conseille l´utilisation de fraises spéciales de profils complétement droits.

# Ref. 5512

## FRESA TALLADO EJES ESTRIADOS
Spline Cutter
Fraise à tailler les arbres cannelés

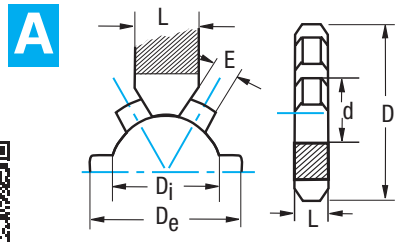



| HSS | **Perfil** **Profile** Profil A* |
|---|---|
| DIN 5462 5463 | **6 Estrías** **6 grooves** 6 rainures |

| **Eje** **Axis /** Axe **DIN 5463** | **Eje** **Axis /** Axe **DIN 5462** | **N° Estrías** **Grooves** Rainures | **D** **mm** | **d** **mm** | **L** **mm** | **N° Cortes** **Cuts** Coupes | **N° Art.** **HSS** | **€** |
|---|---|---|---|---|---|---|---|---|
| **11×14×3** | | 6 | 50 | 16 | 5,25 | 12 | 50237 | **196,46** |
| **13×16×3,5** | | 6 | 50 | 16 | 6,00 | 12 | 50240 | **196,46** |
| **16×20×4** | | 6 | 50 | 16 | 7,50 | 12 | 50243 | **183,96** |
| **18×22×5** | | 6 | 50 | 16 | 7,50 | 12 | 50246 | **183,96** |
| **21×25×5** | | 6 | 56 | 22 | 8,50 | 12 | 50249 | **192,16** |
| **23×28×6** | **23×26×6** | 6 | 56 | 22 | 10,00 | 12 | 50255 | **192,16** |
| **26×32×6** | **26×30×6** | 6 | 63 | 22 | 12,50 | 12 | 50261 | **239,35** |
| **28×34×7** | **28×32×7** | 6 | 63 | 22 | 12,50 | 12 | 50267 | **239,35** |

# Ref. 5522

## FRESA TALLADO EJES ESTRIADOS
Spline Cutter
Fraise à tailler les arbres cannelés




| HSS | **Perfil** **Profile** Profil A* |
|---|---|
| DIN 5462 5463 | **8 Estrías** **8 grooves** 8 rainures |

| **Eje** **Axis /** Axe **DIN 5463** | **Eje** **Axis /** Axe **DIN 5462** | **N° Estrías** **Grooves** Rainures | **D** **mm** | **d** **mm** | **L** **mm** | **N° Cortes** **Cuts** Coupes | **N° Art.** **HSS** | **€** |
|---|---|---|---|---|---|---|---|---|
| **32×38×6** | **32×36×6** | 8 | 70 | 27 | 10,50 | 12 | 50387 | **271,53** |
| **36×42×7** | **36×40×7** | 8 | 70 | 27 | 11,25 | 12 | 50393 | **271,53** |
| **42×48×8** | **42×46×8** | 8 | 70 | 27 | 12,50 | 12 | 50399 | **271,53** |
| **46×54×9** | **46×50×9** | 8 | 70 | 27 | 14,00 | 12 | 50405 | **271,53** |
| **52×60×10** | **52×58×10** | 8 | 70 | 27 | 15,50 | 12 | 50411 | **271,53** |
| **56×65×10** | **56×62×10** | 8 | 80 | 27 | 17,50 | 12 | 50417 | **358,90** |
| **62×72×12** | **62×68×12** | 8 | 80 | 27 | 18,50 | 12 | 50423 | **358,90** |

**Refs. 5512 - 5522**

- *** Otros Perfiles bajo demanda**
- *** Other Profiles upon request**
- * Autres profils sur demande

| | | | | |
|---|---|---|---|---|
| **B** | | **Acabado / Desbaste Protuberancias** | **Finishing / Roughing Protuberances** | Finition / Ébauche Protubérances |
| **C** | | **Acabado. Chaflanes** | **Finishing. Chamfers** | Finition / Rayons |
| **D** | | **Acabado / Desbaste Chaflanes + Protuberancias** | **Finishing / Roughing Chamfers + Protuberances** | Finition / Ébauche Rayons + Protubérances |
| **E** | | **Especial Desbaste Protuberancias Laterales + Chaflanes** | **Special Roughing Side Protuberances + Chamfers** | Spécial Ébauche Protub. Latérales + Rayons |

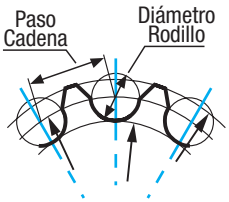
# Ref. 5700

## FRESA TALLADO RUEDAS CADENA
Roller Chain Sprocket Cutter
Fraise pour roues à chaine

HSS | DIN 8198 | Tol. d (H7) D (j16)

**Ruedas Cadena**
**Roller Chains**
Pignons chaînes

**Ejecución Terminada Cuchilla**
**Insert Finished**
Exécution terminée lame




| **Paso** Pitch Pas | **Ø Rodillo** **Roller** / Rouleau | **D** **mm** | **d** **mm** | **N° Cortes** **Cuts** Coupes |
|---|---|---|---|---|
| 6,00 | 4,00 | 56 | 22 | 11 |
| 6,35 | 3,30 | 56 | 22 | 11 |
| 8,00 | 5,00 | 63 | 22 | 11 |
| 9,53 | 5,00 | 70 | 22 | 11 |
| 9,53 | 6,00 | 70 | 22 | 11 |
| 9,53 | 6,35 | 70 | 22 | 11 |
| 12,70 | 7,75** | 70 | 22 | 10 |
| 12,70 | 7,94 | 70 | 22 | 10 |
| 12,70 | 8,51 | 70 | 22 | 10 |
| 15,88 | 10,16 | 80 | 27 | 9 |
| 19,05 | 11,91** | 90 | 27 | 9 |
| 19,05 | 12,07 | 90 | 27 | 9 |
| 25,40 | 15,88 | 100 | 27 | 9 |
| *30,00 | 15,88 | 110 | 32 | 9 |
| 31,75 | 19,05 | 110 | 32 | 9 |
| 38,10 | 22,23 | 125 | 32 | 9 |
| 38,10 | 25,40 | 125 | 32 | 9 |
| 44,45 | 25,40 | 140 | 40 | 9 |
| 44,45 | 27,94 | 140 | 40 | 9 |
| 50,80 | 28,57** | 140 | 40 | 8 |
| 50,80 | 29,21 | 140 | 40 | 8 |
| 57,15 | 35,71 | 160 | 40 | 7 |
| 63,50 | 39,37** | 160 | 40 | 7 |
| 63,50 | 39,68 | 160 | 40 | 7 |
| 76,20 | 47,63** | 200 | 50 | 7 |
| 76,20 | 48,26 | 200 | 50 | 7 |

**Ref. 5700 bajo demanda / upon request** / sur demande

*** 30,00 evitar en lo posible / avoid when possible /** à éviter si possible

| **Perfil Ref. N°** **Profile Ref. N°** Profil ref. n° | **Dientes a Tallar** **Teeth to Sharp** Dents à tailler |
|---|---|
| I | 6-8 Z |
| II | 9-11 Z |
| III | 12-16 Z |
| IV | 17-29 Z |
| V | >29 Z |

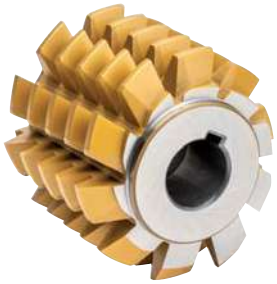
** **Para estos Ø -s de Rodillo sirven los Perfiles del Ø de Rodillo inmediatamente superior de igual paso.**

** **For these Roller Chain Ø-s are suitable the Profiles of the superior Roller Chain Ø-s with equivalent Pitch.**

** Pour ces Ø de rouleau on peut utiliser les profils de rouleau immédiatement supérieur de même pas.

# Ref. 5206

## FRESA MADRE TALLADO ENGRANAJES
Involute Gear Hob
Fraise mère à tailler les engranages



HSSE 5% Co | TIN | DIN 858 | Ang. Presión β 20° | Tol. ø (H6) | Modular

**Perfil Rectificado**
**Ground. Profile** Profil rectifié
**P. Ref. II DIN 3972**

**Perfil Acabado**
**Finish Profile**
Profil finition

| Mod. | D mm | d mm | L mm | N° Cortes Cuts Coupes | N° Art. 5% Co | € | N° Art. TIN* | € |
|---|---|---|---|---|---|---|---|---|
| 0,50 | 45 | 22 | 35 | 12 | 49349 | 585,40 | 71569 | 688,71 |
| 0,75 | 45 | 22 | 45 | 12 | 49352 | 585,40 | 71570 | 688,71 |
| 1,00 | 50 | 22 | 50 | 12 | 49355 | 585,40 | 20550 | 688,71 |
| 1,25 | 50 | 22 | 50 | 12 | 49358 | 585,40 | 71571 | 688,71 |
| 1,50 | 55 | 22 | 55 | 12 | 49361 | 658,57 | 52335 | 774,81 |
| 1,75 | 55 | 22 | 55 | 10 | 68042 | 658,57 | 60644 | 774,81 |
| 2,00 | 60 | 22 | 60 | 10 | 49364 | 768,34 | 49365 | 903,94 |
| 2,25 | 60 | 22 | 60 | 10 | 49367 | 768,34 | 52338 | 903,94 |
| 2,50 | 65 | 22 | 65 | 10 | 49370 | 768,34 | 68048 | 903,94 |
| 2,75 | 65 | 22 | 65 | 10 | 49373 | 768,34 | 71572 | 903,94 |
| 3,00 | 70 | 27 | 70 | 10 | 49376 | 823,23 | 79860 | 968,49 |
| 3,25 | 75 | 27 | 70 | 9 | 68045 | 914,68 | 71574 | 1.076,11 |
| 3,50 | 75 | 27 | 75 | 9 | 49379 | 914,68 | 71518 | 1.076,11 |
| 3,75 | 80 | 27 | 75 | 9 | 49382 | 1.024,46 | 71575 | 1.205,24 |
| 4,00 | 80 | 27 | 80 | 9 | 49385 | 1.024,46 | 77580 | 1.205,24 |
| 4,50 | 85 | 27 | 85 | 9 | 49391 | 1.024,46 | 41453 | 1.205,24 |
| 5,00 | 95 | 27 | 90 | 9 | 49397 | 1.170,81 | 13050 | 1.377,43 |
| 5,50 | 100 | 32 | 95 | 9 | 49400 | 1.243,97 | 41966 | 1.463,51 |
| 6,00 | 105 | 32 | 100 | 9 | 49403 | 1.390,35 | 16940 | 1.635,68 |
| *6,50 | 110 | 32 | 110 | 9 | 49406 | 1.609,86 | 71576 | 1.893,94 |
| *7,00 | 115 | 32 | 115 | 9 | 49409 | 1.719,64 | 71577 | 2.023,10 |
| * 8,00 | 120 | 32 | 130 | 9 | 49412 | 2.048,91 | 68051 | 2.410,47 |
| *9,00 | 125 | 32 | 145 | 8 | 49415 | 2.378,20 | 71578 | 2.797,88 |
| * 10,00 | 140 | 32 | 160 | 8 | 49418 | 3.292,89 | 49420 | 3.874,01 |

*** Mod. bajo demanda / upon request** / sur demande

*** TIN bajo demanda / upon request** / sur demande

### FRESAS MADRE BAJO DEMANDA
**Gear Hobs upon request**
Fraises mère sur demande

| | Ref. | DIN | Descrip. |
|---|---|---|---|
| | 5226 | 858 Pitch | **Perfil Rectificado**<br>**Ground Profile** Profil rectifié<br>**P. Ref. II DIN 3972** |
| | 5246 | 8002 B | **Perfil Rectificado**<br>**Ground Profile** Profil rectifié<br>**P. Ref. II DIN 3972** |
| | 5616<br>5626<br>5636 | 5462-63 | **Tallar Ejes Estriados**<br>**Spline Saft Hobs**<br>Taillaide axes striés |
| | 5800 | 2315 | **Ruedas Cadena**<br>**Roller Chains**<br>Roues à chaine |

Technical Expertise in Heat Treatment

izartool.com/en

IZAR CUTTING TOOLS

07.

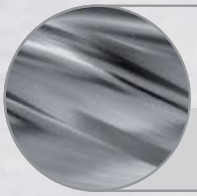
# FRESAS ROTATIVAS METAL DURO

Hard Metal Rotary Burrs

Fraises limes rotatives carbure

454

# TIPOS DE DENTADO
## Teeth Types
## Types de denture



**Dentado** Teeth Denture **1**

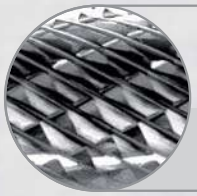
**MATERIALES NO FERROSOS**
Non-Ferrous Materials
Matériaux non ferreux

**Dentado** Teeth Denture **3**

**USO GENERAL**
General Purpose
Utilisation Générale

**Dentado** Teeth Denture **4**

**VIRUTA CORTA**
Short Chipping
Copeaux Courts



**Dentado** Teeth Denture **6**

**MATERIALES DUROS**
Hard Materials
Matériaux Durs

**Dentado** Teeth Denture **M**

**INOXIDABLES**
Stainless Steels
Aciers Inox

**Dentado** Teeth Denture **S**

**TITANIO, INCONEL...**
Titanium, Inconel...
Titane, Inconel...

# TABLA USO FRESAS ROTATIVAS
Rotary Burrs Use Table
Tableau usage fraises limes rotatives

**Recomendaciones Uso:**

- **Trabajar con las máximas revoluciones, menos en materiales malos conductores del calor, como INOX o Titanio.**
- **Aplicar un movimiento constante y una ligera presión de la rotativa.**
- **Es posible modificar las condiciones de la tabla.**
- **Los materiales duros y las series largas requieren de menos r.p.m. (max. 15.000)**
- **Dejar que la viruta se caliente mucho por contacto puede causar que se ablande la soldadura y se suelte la cabeza del mango.**
- **No profundizar la rotativa más de 1/3 de su periferia.**
- **Usar gafas protectoras para su seguridad.**

Suggestions for Use:

- Working with máximum revolutions, except for bad heat-conducting materials, like Stainless Steel or Titanium.
- Employ constant movement and soft pressure.
- It's possible to modify table`s conditions.
- Hard materials and long series need less r.p.m. (max. 15.000)
- If you let chipping to heat too much, welding could get softened and shank's head could drop.
- Don't go deeper than 1/3 of burrs' periphery.
- Use protecting glasses for your own security.

Conseils d´utilisation:

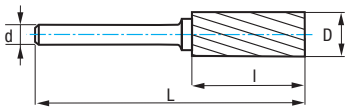
- Travailler aux maximales tours par minute, moins sur des matériaux mauvais conducteurs de la chaleur comme les INOX où les Titaniums.
- Employer un mouvement constant et une faible préssion de la fraise lime.
- C´est possible de modifier les conditions du tableau.
- Les matériaux durs et les séries longues ont besoin de tours par minute inférieurs. (max. 15.000)
- Laisser les copeaux s´echauffer par contact peut provoquer l´amollissement de la soudure et la séparation de la tête de la queue.
- Pas approfondir la fraise lime plus de 1/3 de sa périférie.
- Travailler toujour avec lunettes de protection.

| Material | | | RPM | Ø 3 mm | Ø 6 mm | Ø 10 mm | Ø 12 mm | Ø 16 mm | Ø 20 mm |
|---|---|---|---|---|---|---|---|---|---|
| P | | P.1 | <850 N/mm² | 80.000 | 50.000 | 30.000 | 25.000 | 20.000 | 15.000 |
| | | P.2 | < 1000 N/mm² | 80.000 | 50.000 | 30.000 | 25.000 | 20.000 | 15.000 |
| | | P.3 | 1000-1300 N/mm² | 80.000 | 40.000 | 25.000 | 20.000 | 15.000 | 10.000 |
| | | P.5 | MARTENSÍTICO Martensitic Martensitique | 80.000 | 40.000 | 25.000 | 20.000 | 15.000 | 10.000 |
| M | INOX AUSTENÍTICO Austenitic Stainless Steel Aciers Inox Austénitique | | | 80.000 | 40.000 | 25.000 | 20.000 | 15.000 | 10.000 |
| K | FUNDICIÓN Cast Iron Fonte | K.1 | < 700 N/mm² | 65.000 | 45.000 | 30.000 | 25.000 | 20.000 | 12.000 |
| | | K.2 | 700-1000 N/mm² | 65.000 | 45.000 | 30.000 | 25.000 | 20.000 | 12.000 |
| S | ALEACIONES TERMORRESISTENTES Heat-Resistant Alloys Alliages résistants à la chaleur | | | 80.000 | 40.000 | 25.000 | 20.000 | 15.000 | 10.000 |
| N | Cu - BRONCE - LATÓN Copper - Bronze - Brass Cuivre - Bronze - Laiton | N.1 | VIRUTA CORTA Short Chip Copeaux Courts | 65.000 | 45.000 | 30.000 | 25.000 | 20.000 | 12.000 |
| | | N.2 | VIRUTA LARGA Long Chip Copeaux Longs | 65.000 | 45.000 | 30.000 | 25.000 | 20.000 | 12.000 |
| | ALUMINIO - MAGNESIO Aluminium - Magnesium | N.3 | NO ALEADO Unalloyed Sans Alliage | 65.000 | 40.000 | 25.000 | 20.000 | 15.000 | 10.000 |
| | | N.4 | < 10% Si | 65.000 | 40.000 | 25.000 | 20.000 | 15.000 | 10.000 |
| | | N.5 | > 10% Si | 65.000 | 40.000 | 25.000 | 20.000 | 15.000 | 10.000 |
| | | N.6 | TERMOPLÁSTICOS Thermoplastics Thermoplastiques | 65.000 | 40.000 | 25.000 | 20.000 | 15.000 | 10.000 |
| | | N.7 | DUROPLÁSTICOS Hard-Plastics Plastiques Durs | 65.000 | 40.000 | 25.000 | 20.000 | 15.000 | 10.000 |

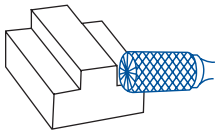
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

# Ref. 9260

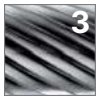
## FRESA ROTATIVA MD TIPO B
B Type HM Rotary Burr
Fraise lime rotative carbure type B




**MD**/HM Carbure | **MD**/HM + ALTIN | **Tipo** B Type | **Norma** ZYA-S Norm



**MATERIALES NO FERROSOS**
**Non-Ferrous Materials**
Matériaux non ferreux




**USO GENERAL**
**General Purpose**
Utilisation Générale

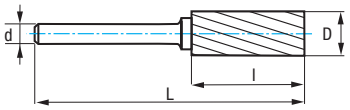
**VIRUTA CORTA**
**Short Chipping**
Copeaux Courts

**MATERIALES DUROS**
**Hard Materials**
Matériaux Durs

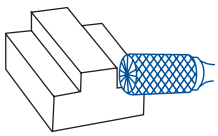
| D mm | d mm | L mm | l mm | Dentado Teeth / Denture 1 | | Dentado Teeth / Denture 1 ALTIN | | Dentado Teeth / Denture 3 | | Dentado Teeth / Denture 4 | | Dentado Teeth / Denture 6 | | Dentado Teeth / Denture 6 ALTIN | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | N° Art. MD/HM | € | N° Art. ALTIN | € | N° Art. MD/HM | € | N° Art. MD/HM | € | N° Art. MD/HM | € | N° Art. ALTIN | € |
| **3,00** | **3,00** | 38,00 | 14,00 | 55677 | **11,71** | | | 44072 | **10,35** | 44079 | **11,71** | 44086 | **11,33** | 66485 | **18,41** |
| **6,00** | **6,00** | 50,00 | 18,00 | 55680 | **25,06** | | | 44074 | **22,06** | 44081 | **25,06** | 44141 | **24,30** | 66486 | **32,00** |
| **6,30** | **3,00** | 45,00 | 12,70 | 55679 | **20,37** | | | 44073 | **17,46** | 44080 | **20,37** | 44122 | **19,21** | | |
| **8,00** | **6,00** | 64,00 | 19,00 | 55681 | **31,61** | | | 44075 | **26,34** | 44082 | **31,61** | 44142 | **28,96** | 66487 | **37,19** |
| **9,60** | **6,00** | 64,00 | 19,00 | 44070 | **35,85** | 55864 | **43,38** | 44076 | **29,91** | 44083 | **35,85** | 44143 | **32,88** | 43567 | **39,80** |
| **12,70** | **6,00** | 70,00 | 25,00 | 44071 | **48,34** | 55866 | **78,58** | 44077 | **41,97** | 44084 | **50,40** | 44144 | **46,21** | 66488 | **72,09** |
| **12,70** | **8,00** | 70,00 | 25,00 | 55691 | **48,36** | | | 55689 | **40,33** | | | 55690 | **44,37** | | |
| **16,00** | **6,00** | 70,00 | 25,00 | 55682 | **65,77** | | | 44078 | **54,82** | 44085 | **65,77** | 44145 | **60,28** | | |
| **16,00** | **8,00** | 70,00 | 25,00 | 55695 | **60,98** | | | 55692 | **50,84** | | | 55693 | **55,93** | | |
| **19,00** | **6,00** | 70,00 | 25,00 | 55685 | **90,68** | | | 55683 | **75,63** | | | 55684 | **83,19** | | |
| **25,00** | **6,00** | 70,00 | 25,00 | 55688 | **126,79** | | | 55686 | **105,74** | | | 55687 | **116,32** | | |

# Ref. 9240

## FRESA ROTATIVA MD TIPO B LARGA
Long B Type HM Rotary Burr
Fraise lime rotative carbure type B longue




**MD**/HM Carbure | **Tipo** B Type | **Norma** ZYA-S Norm



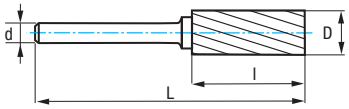
**USO GENERAL**
**General Purpose**
Utilisation Générale

**MATERIALES DUROS**
**Hard Materials**
Matériaux Durs

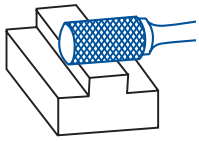
| D mm | d mm | L mm | l mm | Dentado Teeth / Denture 3 | | Dentado Teeth / Denture 6 | |
|---|---|---|---|---|---|---|---|
| | | | | N° Art. MD/HM | € | N° Art. MD/HM | € |
| **6,00** | **6,00** | 150,00 | 18,00 | 55832 | **75,23** | 55833 | **82,76** |
| **9,60** | **6,00** | 172,00 | 19,00 | 55834 | **50,43** | 55835 | **55,50** |
| **12,70** | **6,00** | 178,00 | 25,00 | 55836 | **71,39** | 55837 | **78,54** |

# Ref. 9250

## FRESA ROTATIVA MD TIPO A
A Type HM Rotary Burr
Fraise lime rotative carbure type A




**MD**/HM Carbure | **MD**/HM + ALTIN | **Tipo** A Type | **Norma** ZYA Norm



1
**MATERIALES NO FERROSOS**
**Non-Ferrous Materials**
Matériaux non ferreux

3
**USO GENERAL**
**General Purpose**
Utilisation Générale

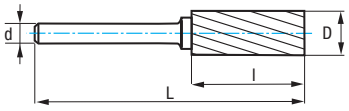
4
**VIRUTA CORTA**
**Short Chipping**
Copeaux Courts

6
**MATERIALES DUROS**
**Hard Materials**
Matériaux Durs

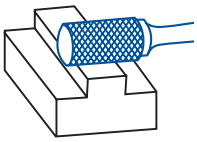
| D mm | d mm | L mm | l mm | Dentado Teeth / Denture 1 N° Art. MD/HM | € | Dentado Teeth / Denture 1 ALTIN N° Art. ALTIN | € | Dentado Teeth / Denture 3 N° Art. MD/HM | € | Dentado Teeth / Denture 4 N° Art. MD/HM | € | Dentado Teeth / Denture 6 N° Art. MD/HM | € | Dentado Teeth / Denture 6 ALTIN N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **3,00** | **3,00** | 38,00 | 14,00 | 55644 | **10,69** | | | 44149 | **9,26** | 44156 | **10,69** | 44245 | **10,18** | 66489 | **16,69** |
| **6,00** | **6,00** | 50,00 | 18,00 | 55648 | **22,76** | | | 44151 | **19,94** | 44158 | **22,76** | 44417 | **21,91** | 66490 | **28,79** |
| **6,30** | **3,00** | 45,00 | 12,70 | 55645 | **18,51** | | | 44150 | **15,66** | 44157 | **18,51** | 44301 | **17,23** | | |
| **8,00** | **6,00** | 64,00 | 19,00 | 55651 | **29,04** | | | 44152 | **24,21** | 44159 | **29,04** | 44418 | **26,60** | 66491 | **33,85** |
| **9,60** | **6,00** | 64,00 | 19,00 | 44147 | **32,43** | 55861 | **49,30** | 44153 | **27,05** | 44160 | **32,43** | 44419 | **29,77** | 63933 | **45,24** |
| **12,70** | **6,00** | 70,00 | 25,00 | 44148 | **43,95** | 55863 | **71,45** | 44154 | **38,44** | 44161 | **46,11** | 44421 | **42,27** | 66492 | **65,55** |
| **12,70** | **8,00** | 70,00 | 25,00 | 55671 | **46,07** | | | 55669 | **38,44** | | | 55670 | **42,27** | | |
| **16,00** | **6,00** | 70,00 | 25,00 | 55653 | **59,79** | | | 44155 | **49,82** | 44173 | **59,79** | 44422 | **54,82** | | |
| **16,00** | **8,00** | 70,00 | 25,00 | 55675 | **55,42** | | | 55672 | **46,23** | | | 55673 | **50,84** | | |
| **19,00** | **6,00** | 70,00 | 25,00 | 55664 | **82,44** | | | 55655 | **68,75** | | | 55657 | **75,63** | | |
| **25,00** | **6,00** | 70,00 | 25,00 | 55668 | **115,27** | | | 55666 | **96,13** | | | 55667 | **105,75** | | |

# Ref. 9230

## FRESA ROTATIVA MD TIPO A LARGA
Long A Type HM Rotary Burr
Fraise lime rotative carbure type A longue




**MD**/HM Carbure | **Tipo** A Type | **Norma** ZYA Norm



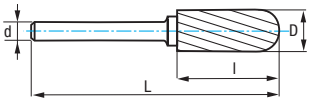
6
**MATERIALES DUROS**
**Hard Materials**
Matériaux Durs

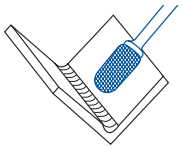
| D mm | d mm | L mm | l mm | Dentado Teeth / Denture 6 N° Art. MD/HM | € |
|---|---|---|---|---|---|
| **6,00** | **6,00** | 150,00 | 18,00 | 55829 | **75,23** |
| **9,60** | **6,00** | 172,00 | 19,00 | 55830 | **50,43** |
| **12,70** | **6,00** | 178,00 | 25,00 | 55831 | **71,39** |

# Ref. 9251

## FRESA ROTATIVA MD TIPO C RADIAL
Radial C Type HM Rotary Burr
Fraise lime rotative carbure type C hemisphérique

**MD**/HM Carbure | **MD**/HM + ALTIN | **Tipo** C Type | **Norma** WRC Norm



**MATERIALES NO FERROSOS**
Non-Ferrous Materials
Matériaux non ferreux

**USO GENERAL**
General Purpose
Utilisation Générale

**VIRUTA CORTA**
Short Chipping
Copeaux Courts

**MATERIALES DUROS**
Hard Materials
Matériaux Durs

**TITANIO, INCONEL...**
Titanium, Inconel...
Titane, Inconel...

| D mm | d mm | L mm | l mm | Dentado Teeth / Denture 1 N° Art. MD/HM | € | Dentado Teeth / Denture 1 ALTIN N° Art. ALTIN | € | Dentado Teeth / Denture 3 N° Art. MD/HM | € | Dentado Teeth / Denture 4 N° Art. MD/HM | € | Dentado Teeth / Denture 6 N° Art. MD/HM | € | Dentado Teeth / Denture 6 ALTIN N° Art. ALTIN | € | Dentado Teeth / Denture S ALTIN N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **3,00** | **3,00** | 38,00 | 14,00 | 55696 | **13,69** | | | 44425 | **11,39** | 44431 | **13,69** | 44437 | **12,52** | 66493 | **16,69** | 83022 | **16,69** |
| **6,00** | **6,00** | 50,00 | 18,00 | 55698 | **25,65** | | | 44426 | **21,34** | 44432 | **25,65** | 44438 | **23,49** | 66494 | **29,50** | | |
| **8,00** | **6,00** | 64,00 | 18,00 | 55699 | **31,61** | | | 44427 | **26,34** | 44433 | **31,61** | 44439 | **28,96** | 66495 | **36,82** | | |
| **9,60** | **6,00** | 64,00 | 19,00 | 44423 | **36,72** | 55867 | **54,89** | 44428 | **30,59** | 44434 | **36,72** | 44440 | **33,65** | 66496 | **50,36** | | |
| **12,70** | **6,00** | 70,00 | 25,00 | 44424 | **51,23** | 55868 | **80,13** | 44429 | **42,71** | 44435 | **51,23** | 44441 | **46,97** | 66497 | **73,51** | | |
| **12,70** | **8,00** | 70,00 | 25,00 | 55708 | **49,31** | | | 55706 | **41,13** | | | 55707 | **45,25** | | | | |
| **16,00** | **6,00** | 70,00 | 25,00 | 12138 | **66,61** | | | 44430 | **55,52** | 44436 | **66,61** | 44442 | **61,08** | | | | |
| **16,00** | **8,00** | 70,00 | 25,00 | 55711 | **62,06** | | | 55709 | **51,75** | | | 55710 | **56,93** | | | | |
| **19,00** | **6,00** | 70,00 | 25,00 | 55702 | **89,08** | | | 55700 | **74,29** | | | 55701 | **81,73** | | | | |
| **25,00** | **6,00** | 70,00 | 25,00 | | | | | 55704 | **100,95** | | | 55705 | **111,02** | | | | |

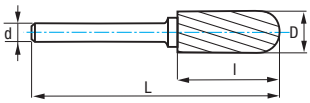
New!

**INOXIDABLES**
Stainless Steels
Aciers Inox

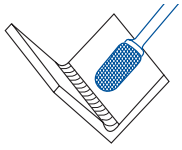
| D mm | d mm | L mm | l mm | Dentado Teeth / Denture M N° Art. MD/HM | € |
|---|---|---|---|---|---|
| **9,60** | **6,00** | 64,00 | 19,00 | 20076 | **33,65** |
| **12,70** | **6,00** | 70,00 | 25,00 | 20080 | **46,97** |

# Ref. 9231

## FRESA ROTATIVA MD TIPO C RADIAL LARGA
Long Radial C Type HM Rotary Burr
Fraise lime rotative carbure type C hemisphérique longue




**MD**/HM Carbure | **Tipo** C Type | **Norma** WRC Norm

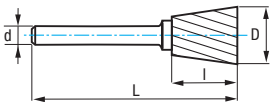


**MATERIALES DUROS**
Hard Materials
Matériaux Durs

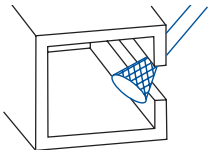
| D mm | d mm | L mm | l mm | Dentado Teeth / Denture 6 N° Art. MD/HM | € |
|---|---|---|---|---|---|
| **6,00** | **6,00** | 150,00 | 18,00 | 55838 | **76,93** |
| **9,60** | **6,00** | 172,00 | 19,00 | 55839 | **47,34** |
| **12,70** | **6,00** | 178,00 | 25,00 | 55840 | **67,16** |

# Ref. 9252

## FRESA ROTATIVA MD TIPO N CONO INVERTIDO
Inverted Cone N Type HM Rotary Burr
Fraise lime rotative carbure type N sans coupe en bout




**MD**/HM Carbure | **Tipo** N Type | **Norma** WKN Norm



**USO GENERAL**
**General Purpose**
Utilisation Générale

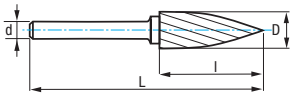
**VIRUTA CORTA**
**Short Chipping**
Copeaux Courts

**MATERIALES DUROS**
**Hard Materials**
Matériaux Durs

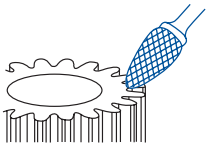
| D mm | d mm | L mm | l mm | Ang. | Dentado Teeth / Denture 3 | | Dentado Teeth / Denture 4 | | Dentado Teeth / Denture 6 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | N° Art. MD/HM | € | N° Art. MD/HM | € | N° Art. MD/HM | € |
| **3,00** | **3,00** | 38,00 | 4,00 | 10º | 44443 | **11,39** | 44450 | **13,69** | 44455 | **12,52** |
| **6,00** | **6,00** | 50,00 | 8,00 | 10º | 44447 | **19,94** | 44452 | **23,92** | 44458 | **21,92** |
| **6,30** | **3,00** | 39,00 | 6,00 | 12º | 44445 | **17,81** | 44451 | **21,36** | 44457 | **19,60** |
| **12,70** | **6,00** | 57,00 | 12,00 | 28º | 44448 | **31,43** | 44453 | **37,71** | 44460 | **34,56** |
| **12,70** | **8,00** | 58,00 | 12,70 | 28º | 55825 | **40,89** | | | 55826 | **44,99** |
| **16,00** | **6,00** | 64,00 | 19,00 | 18º | 44449 | **52,53** | 44454 | **62,96** | 44461 | **57,76** |
| **16,00** | **8,00** | 64,00 | 19,00 | 18º | 55827 | **52,53** | | | 55828 | **57,76** |
| **19,00** | **6,00** | 61,00 | 16,00 | 30º | 55823 | **59,01** | | | 55824 | **64,91** |

# Ref. 9254

## FRESA ROTATIVA MD TIPO G OJIVA
Tree G Type HM Rotary Burr
Fraise lime rotative carbure type G ogive




| **MD**/HM Carbure | **MD**/HM + ALTIN | **Tipo** G Type | **Norma** SPG Norm |
|---|---|---|---|



**MAT. NO FERROSOS**
**Non-Ferrous Mat.**
Mat. non ferreux

**USO GENERAL**
**General Purpose**
Utilisation Générale

**VIRUTA CORTA**
**Short Chipping**
Copeaux Courts

**MATERIALES DUROS**
**Hard Materials**
Matériaux Durs

| **D** mm | **d** mm | **L** mm | **l** mm | **Dentado** Teeth / Denture **1** | | **Dentado** Teeth / Denture **3** | | **Dentado** Teeth / Denture **4** | | **Dentado** Teeth / Denture **6** | | **Dentado** Teeth / Denture **6 ALTIN** | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **N° Art. MD/HM** | **€** | **N° Art. MD/HM** | **€** | **N° Art. MD/HM** | **€** | **N° Art. MD/HM** | **€** | **N° Art. ALTIN** | **€** |
| **3,00** | **3,00** | 38,00 | 14,00 | 55783 | **13,69** | 44466 | **11,39** | 44472 | **13,69** | 44487 | **12,52** | 66505 | **16,69** |
| **6,00** | **6,00** | 50,00 | 18,00 | 55784 | **25,65** | 44467 | **21,34** | 44473 | **25,65** | 44488 | **23,49** | 66506 | **29,21** |
| **8,00** | **6,00** | 64,00 | 19,00 | 55785 | **29,04** | 44468 | **24,21** | 44474 | **29,04** | 44494 | **26,56** | | |
| **9,60** | **6,00** | 64,00 | 19,00 | 44463 | **34,17** | 44469 | **28,49** | 44475 | **34,17** | 44500 | **31,31** | 55882 | **42,05** |
| **12,70** | **6,00** | 70,00 | 25,00 | 44464 | **42,71** | 44470 | **35,59** | 44476 | **42,71** | 44512 | **39,15** | 27566 | **53,11** |
| **12,70** | **8,00** | 70,00 | 25,00 | 55787 | **44,52** | 17105 | **37,12** | | | 55786 | **40,86** | | |
| **16,00** | **6,00** | 70,00 | 25,00 | | | | | 44482 | **59,79** | | | | |
| **16,00** | **6,00** | 75,00 | 30,00 | 44465 | **59,79** | 44471 | **49,82** | | | 44518 | **54,82** | | |
| **16,00** | **8,00** | 70,00 | 25,00 | 55790 | **61,92** | 55788 | **51,65** | | | 55789 | **56,81** | | |

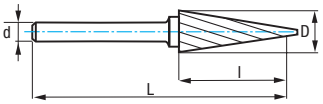
New!

**INOXIDABLES**
**Stainless Steels**
Aciers Inox

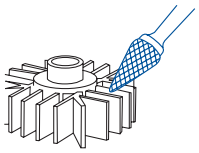
| **D** mm | **d** mm | **L** mm | **l** mm | **Dentado** Teeth / Denture **M** | |
|---|---|---|---|---|---|
| | | | | **N° Art. MD/HM** | **€** |
| **9,60** | **6,00** | 64,00 | 19,00 | 20087 | **31,31** |
| **12,70** | **6,00** | 70,00 | 25,00 | 20088 | **39,15** |

# Ref. 9255

## FRESA ROTATIVA MD TIPO M CÓNICA
Cone M Type HM Rotary Burr
Fraise lime rotative carbure type M conique




**MD**/HM Carbure | **Tipo** M Type | **Norma** SKM Norm



**MAT. NO FERROSOS**
Non-Ferrous Mat.
Mat. non ferreux

**USO GENERAL**
General Purpose
Utilisation Générale

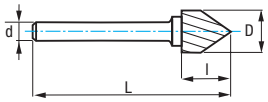
**VIRUTA CORTA**
Short Chipping
Copeaux Courts

**MATERIALES DUROS**
Hard Materials
Matériaux Durs

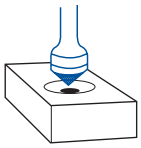
| D mm | d mm | L mm | l mm | Ang. | Dentado Teeth / Denture 1 | | Dentado Teeth / Denture 3 | | Dentado Teeth / Denture 4 | | Dentado Teeth / Denture 6 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | N° Art. MD/HM | € | N° Art. MD/HM | € | N° Art. MD/HM | € | N° Art. MD/HM | € |
| **6,00** | **6,00** | 50,00 | 20,00 | 14º | 55817 | **23,66** | 44530 | **19,70** | 44598 | **23,66** | 44616 | **21,67** |
| **6,30** | **3,00** | 49,00 | 12,70 | 22º | 55816 | **19,70** | 44524 | **16,44** | 44595 | **19,70** | 44613 | **18,07** |
| **8,00** | **6,00** | 64,00 | 18,00 | 22º | | | 44583 | **21,03** | 44601 | **25,24** | 44617 | **23,14** |
| **9,60** | **6,00** | 64,00 | 16,00 | 28º | 55818 | **28,39** | 44586 | **23,66** | 44604 | **28,39** | 44619 | **26,03** |
| **12,70** | **6,00** | 71,00 | 22,00 | 28º | 25335 | **37,86** | 44589 | **31,52** | 44607 | **37,86** | 44620 | **34,69** |
| **12,70** | **8,00** | 71,00 | 22,00 | 28º | | | 55819 | **41,07** | | | 55820 | **45,18** |
| **16,00** | **6,00** | 71,00 | 25,00 | 31º | | | 44592 | **42,71** | 44610 | **51,24** | 44622 | **46,97** |
| **16,00** | **8,00** | 71,00 | 25,00 | 31º | | | 55821 | **54,81** | | | 55822 | **60,29** |

# Ref. 9256

## FRESA ROTATIVA MD TIPO K CÓNICA 90°
90° Cone K Type HM Rotary Burr
Fraise lime rotative carbure type K conique 90°




**MD**/HM Carbure | **Tipo** K Type | **Norma** KSK Norm



**USO GENERAL**
General Purpose
Utilisation Générale

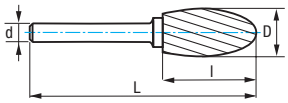
**VIRUTA CORTA**
Short Chipping
Copeaux Courts

**MATERIALES DUROS**
Hard Materials
Matériaux Durs

| D mm | d mm | L mm | l mm | Dentado Teeth / Denture 3 | | Dentado Teeth / Denture 4 | | Dentado Teeth / Denture 6 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | N° Art. MD/HM | € | N° Art. MD/HM | € | N° Art. MD/HM | € |
| **6,00** | **6,00** | 50,00 | 3,00 | 44625 | **17,09** | 44628 | **20,49** | 44631 | **18,80** |
| **12,70** | **6,00** | 55,00 | 6,30 | 44626 | **28,49** | 44629 | **34,14** | 44632 | **31,31** |
| **12,70** | **8,00** | 55,00 | 6,30 | 55802 | **28,42** | | | 55803 | **31,27** |
| **16,00** | **6,00** | 57,00 | 8,00 | 55796 | **37,87** | | | 55797 | **41,65** |
| **16,00** | **8,00** | 57,00 | 8,00 | 55804 | **37,87** | | | 55805 | **41,65** |
| **19,00** | **6,00** | 59,00 | 9,50 | 55798 | **49,72** | | | 55799 | **54,70** |
| **25,00** | **6,00** | 61,00 | 12,70 | 55800 | **79,77** | | | 55801 | **87,75** |

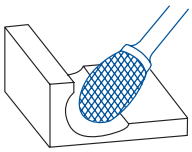
# Ref. 9257

## FRESA ROTATIVA MD TIPO E GOTA
Oval E Type HM Rotary Burr
Fraise lime rotative carbure type E ovale




**MD**/HM Carbure | **Tipo** E Type | **Norma** TRE Norm

New!

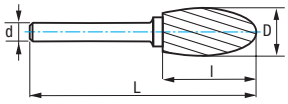


| 1 | 3 | 4 | 6 | M |
|---|---|---|---|---|
| **MAT. NO FERROSOS** Non-Ferrous Mat. Mat. non ferreux | **USO GENERAL** General Purpose Utilisation Générale | **VIRUTA CORTA** Short Chipping Copeaux Courts | **MATERIALES DUROS** Hard Materials Matériaux Durs | **INOXIDABLES** Stainless Steels Aciers Inox |

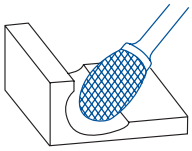
| D mm | d mm | L mm | l mm | Dentado Teeth / Denture 1 | | Dentado Teeth / Denture 3 | | Dentado Teeth / Denture 4 | | Dentado Teeth / Denture 6 | | Dentado Teeth / Denture M | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | N° Art. MD/HM | € | N° Art. MD/HM | € | N° Art. MD/HM | € | N° Art. MD/HM | € | N° Art. MD/HM | € |
| **3,00** | **3,00** | 38,00 | 6,00 | 55733 | **13,69** | 44637 | **11,39** | 44648 | **13,69** | 44655 | **12,52** | | |
| **6,00** | **6,00** | 50,00 | 10,00 | 55735 | **25,65** | 44640 | **21,34** | 44650 | **25,65** | 44657 | **23,49** | | |
| **6,30** | **3,00** | 42,00 | 9,50 | 55734 | **21,34** | 44638 | **17,81** | 44649 | **21,34** | 44656 | **19,57** | | |
| **8,00** | **6,00** | 60,00 | 15,00 | 55737 | **29,04** | 44643 | **24,21** | 44651 | **29,04** | 44658 | **26,60** | | |
| **9,60** | **6,00** | 61,00 | 16,00 | 44634 | **34,17** | 44644 | **28,49** | 44652 | **34,17** | 44659 | **31,31** | 20652 | **31,31** |
| **12,70** | **6,00** | 67,00 | 22,00 | 44635 | **42,71** | 44646 | **35,59** | 44653 | **42,71** | 44660 | **39,15** | 20653 | **39,15** |
| **12,70** | **8,00** | 67,00 | 22,00 | 55746 | **45,92** | 55743 | **38,33** | | | 55744 | **42,14** | | |
| **16,00** | **6,00** | 70,00 | 25,00 | 55738 | **59,79** | 44647 | **49,82** | 44654 | **59,79** | 44661 | **54,82** | | |
| **16,00** | **8,00** | 70,00 | 25,00 | 55749 | **63,83** | 55747 | **53,24** | | | 55748 | **58,56** | | |
| **19,00** | **6,00** | 70,00 | 25,00 | 55741 | **85,73** | 55739 | **71,49** | | | 55740 | **78,64** | | |

# Ref. 9237

## FRESA ROTATIVA MD TIPO E GOTA LARGA
Long Oval E Type HM Rotary Burr
Fraise Llime rotative carbure type E ovale longue




**MD**/HM Carbure | **Tipo** E Type | **Norma** TRE Norm



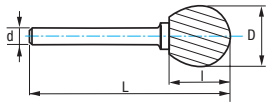
| 3 | 6 |
|---|---|
| **USO GENERAL** General Purpose Utilisation Générale | **MATERIALES DUROS** Hard Materials Matériaux Durs |

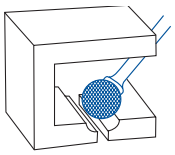
| D mm | d mm | L mm | l mm | Dentado Teeth / Denture 3 | | Dentado Teeth / Denture 6 | |
|---|---|---|---|---|---|---|---|
| | | | | N° Art. MD/HM | € | N° Art. MD/HM | € |
| **9,60** | **6,00** | 168,00 | 16,00 | 55849 | **43,30** | 55851 | **47,63** |
| **12,70** | **6,00** | 184,00 | 22,00 | 55852 | **53,71** | 55854 | **59,09** |

# Ref. 9258

## FRESA ROTATIVA MD TIPO D ESFÉRICA
Ball D Type HM Rotary Burr
Fraise lime rotative carbure type D sphérique

**MD**/HM Carbure | **MD**/HM + ALTIN | **Tipo** D Type | **Norma** KUD Norm



**MATERIALES NO FERROSOS**
Non-Ferrous Materials
Matériaux non ferreux

**USO GENERAL**
General Purpose
Utilisation Générale

**VIRUTA CORTA**
Short Chipping
Copeaux Courts

**MATERIALES DUROS**
Hard Materials
Matériaux Durs

| D mm | d mm | L mm | l mm | Dentado Teeth / Denture 1 | | Dentado Teeth / Denture 1 ALTIN | | Dentado Teeth / Denture 3 | | Dentado Teeth / Denture 4 | | Dentado Teeth / Denture 6 | | Dentado Teeth / Denture 6 ALTIN | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | N° Art. MD/HM | € | N° Art. ALTIN | € | N° Art. MD/HM | € | N° Art. MD/HM | € | N° Art. MD/HM | € | N° Art. ALTIN | € |
| **3,00** | **3,00** | 38,00 | 2,50 | 55713 | **12,63** | | | 44705 | **10,52** | 44712 | **12,63** | 44719 | **11,54** | 66498 | **16,69** |
| **6,00** | **6,00** | 50,00 | 4,70 | 55716 | **23,66** | | | 44707 | **19,70** | 44714 | **23,66** | 44721 | **21,67** | 66499 | **26,88** |
| **6,30** | **3,00** | 38,00 | 5,00 | 55714 | **19,70** | | | 44706 | **16,44** | 44713 | **19,70** | 44720 | **18,07** | | |
| **8,00** | **6,00** | 52,00 | 6,00 | 55717 | **26,82** | | | 44708 | **22,35** | 44715 | **26,82** | 44722 | **24,53** | 66500 | **29,76** |
| **9,60** | **6,00** | 54,00 | 8,00 | 44662 | **29,96** | 55869 | **45,04** | 44709 | **24,96** | 44716 | **29,96** | 44723 | **27,43** | 66501 | **41,31** |
| **12,70** | **6,00** | 56,00 | 11,00 | 44671 | **37,86** | 55870 | **56,44** | 44710 | **31,52** | 44717 | **37,86** | 44724 | **34,69** | 66502 | **51,80** |
| **12,70** | **8,00** | 56,00 | 11,00 | 55728 | **34,74** | | | 55725 | **28,96** | | | 55726 | **31,87** | | |
| **16,00** | **6,00** | 59,00 | 14,00 | 58481 | **53,35** | | | 44711 | **44,65** | 44718 | **53,60** | 44725 | **48,95** | | |
| **16,00** | **8,00** | 59,00 | 14,00 | 55732 | **43,05** | | | 55729 | **35,90** | | | 55731 | **39,50** | | |
| **19,00** | **6,00** | 62,00 | 16,50 | 55720 | **59,42** | | | 55718 | **49,55** | | | 55719 | **54,52** | | |
| **25,00** | **6,00** | 67,00 | 22,00 | 55724 | **102,08** | | | 55722 | **85,14** | | | 55723 | **93,65** | | |

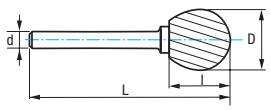
New!

**INOXIDABLES**
Stainless Steels
Aciers Inox

| D mm | d mm | L mm | l mm | Dentado Teeth / Denture M | |
|---|---|---|---|---|---|
| | | | | N° Art. MD/HM | € |
| **9,60** | **6,00** | 54,00 | 8,00 | 20081 | **27,43** |
| **12,70** | **6,00** | 56,00 | 11,00 | 20082 | **34,69** |

# Ref. 9238

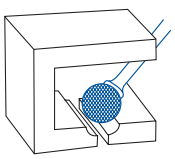
## FRESA ROTATIVA MD TIPO D ESFÉRICA LARGA
Long Ball D Type HM Rotary Burr
Fraise lime rotative carbure type D sphérique longue




**MD**/HM Carbure | **Tipo** D Type | **Norma** KUD Norm

**USO GENERAL**
General Purpose
Utilisation Générale

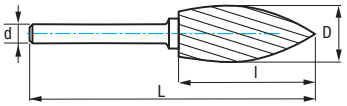
**MATERIALES DUROS**
Hard Materials
Matériaux Durs



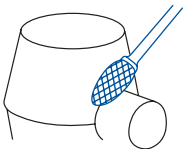
| D mm | d mm | L mm | l mm | Dentado Teeth / Denture 3 | | Dentado Teeth / Denture 6 | |
|---|---|---|---|---|---|---|---|
| | | | | N° Art. MD/HM | € | N° Art. MD/HM | € |
| **8,00** | **6,00** | 182,00 | 6,00 | 55841 | **36,46** | 55842 | **40,10** |
| **9,60** | **6,00** | 170,00 | 8,00 | 55843 | **37,06** | 55845 | **40,77** |
| **12,70** | **6,00** | 175,00 | 11,00 | 55846 | **45,43** | 55848 | **49,98** |

# Ref. 9266

## FRESA ROTATIVA MD TIPO H LLAMA
Flame H Type HM Rotary Burr
Fraise lime rotative carbure type H flamme




| **MD**/HM Carbure | **Tipo** H Type | **Norma** B Norm |
|---|---|---|



**MAT. NO FERROSOS**
**Non-Ferrous Mat.**
Mat. non ferreux

**USO GENERAL**
**General Purpose**
Utilisation Générale

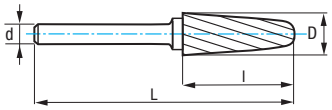
**VIRUTA CORTA**
**Short Chipping**
Copeaux Courts

**MATERIALES DUROS**
**Hard Materials**
Matériaux Durs

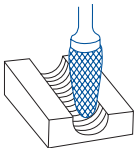
| **D** mm | **d** mm | **L** mm | **l** mm | **Dentado** **Teeth /** Denture **1** | | **Dentado** **Teeth /** Denture **3** | | **Dentado** **Teeth /** Denture **4** | | **Dentado** **Teeth /** Denture **6** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | **N° Art. MD/HM** | **€** | **N° Art. MD/HM** | **€** | **N° Art. MD/HM** | **€** | **N° Art. MD/HM** | **€** |
| **3,00** | **3,00** | 38,00 | 6,00 | | | 44728 | **9,75** | 44735 | **11,68** | 44757 | **10,71** |
| **6,00** | **3,00** | 43,00 | 10,00 | | | 44729 | **16,00** | 44736 | **19,17** | 44760 | **17,58** |
| **6,00** | **6,00** | 50,00 | 14,00 | | | 44730 | **20,30** | 44737 | **27,32** | 44763 | **25,06** |
| **8,00** | **6,00** | 64,00 | 19,00 | 55791 | **30,77** | 44731 | **25,65** | 44738 | **30,77** | 44766 | **28,18** |
| **9,60** | **6,00** | 65,00 | 19,00 | 44726 | **36,72** | 44732 | **30,59** | 44739 | **36,72** | 44769 | **33,65** |
| **12,70** | **6,00** | 77,00 | 32,00 | 44727 | **44,41** | 44733 | **37,04** | 44740 | **44,41** | 44771 | **40,71** |
| **12,70** | **8,00** | 77,00 | 32,00 | | | 55792 | **54,81** | | | 55793 | **60,29** |
| **16,00** | **6,00** | 81,00 | 36,00 | 44773 | **63,18** | 44734 | **52,66** | 44742 | **63,18** | 44772 | **57,93** |
| **16,00** | **8,00** | 81,00 | 36,00 | | | 55794 | **75,69** | | | 55795 | **83,29** |

# Ref. 9267

## FRESA ROTATIVA MD TIPO L CÓNICA REDONDEADA
Ball Nosed Cone L Type HM Rotary Burr
Fraise lime rotative carbure type L conique rayon




**MD**/HM Carbure | **Tipo** L Type | **Norma** KEL Norm



**MAT. NO FERROSOS**
Non-Ferrous Mat.
Mat. non ferreux

**USO GENERAL**
General Purpose
Utilisation Générale

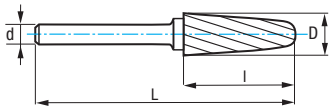
**VIRUTA CORTA**
Short Chipping
Copeaux Courts

**MATERIALES DUROS**
Hard Materials
Matériaux Durs

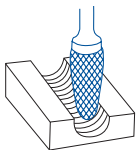
| D mm | d mm | L mm | l mm | Ang. | Dentado Teeth / Denture 1 N° Art. MD/HM | € | Dentado Teeth / Denture 1 ALTIN N° Art. ALTIN | € | Dentado Teeth / Denture 3 N° Art. MD/HM | € | Dentado Teeth / Denture 4 N° Art. MD/HM | € | Dentado Teeth / Denture 6 N° Art. MD/HM | € | Dentado Teeth / Denture 6 ALTIN N° Art. ALTIN | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **3,00** | **3,00** | 38,00 | 14,00 | 10º | 55806 | **13,69** | | | 44776 | **11,39** | 44783 | **13,69** | 44790 | **12,52** | 66507 | **16,69** |
| **6,00** | **6,00** | 50,00 | 18,00 | 14º | 55808 | **28,18** | | | 44778 | **23,49** | 44785 | **28,18** | 44792 | **25,82** | | |
| **6,30** | **3,00** | 48,00 | 15,80 | 22º | 55807 | **21,34** | | | 44777 | **17,81** | 44784 | **21,34** | 44791 | **19,60** | | |
| **8,00** | **6,00** | 70,00 | 25,40 | 14º | 55809 | **34,25** | | | 44779 | **28,49** | 44786 | **34,25** | 44793 | **31,31** | | |
| **10,00** | **6,00** | 65,00 | 20,00 | 14º | 21959 | **41,01** | | | 44780 | **34,17** | 44787 | **41,01** | 44794 | **37,54** | | |
| **12,70** | **6,00** | 77,00 | 32,00 | 14º | 44774 | **51,23** | 66508 | **62,67** | 44781 | **42,71** | 44788 | **51,23** | 44795 | **46,97** | 20159 | **57,50** |
| **12,70** | **8,00** | 77,00 | 32,00 | 14º | 55812 | **47,94** | | | 55810 | **39,98** | | | 55811 | **43,98** | | |
| **16,00** | **6,00** | 78,00 | 33,00 | 14º | 44775 | **76,87** | | | 44782 | **64,05** | 44789 | **76,87** | 44796 | **70,47** | | |
| **16,00** | **8,00** | 78,00 | 33,00 | 14º | 55815 | **94,34** | | | 55813 | **78,68** | | | 55814 | **86,55** | | |

# Ref. 9247

## FRESA ROTATIVA MD TIPO L CÓNICA REDONDEADA LARGA
Long Ball Nosed Cone L Type HM Rotary Burr
Fraise lime rotative carbure type L conique rayon longue




**MD**/HM Carbure | **Tipo** L Type | | **Norma** KEL Norm



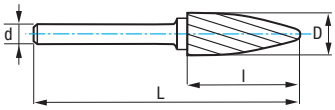
**MATERIALES DUROS**
Hard Materials
Matériaux Durs

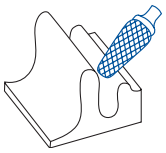
| D mm | d mm | L mm | l mm | Ang. | Dentado Teeth / Denture 6 N° Art. MD/HM | € |
|---|---|---|---|---|---|---|
| **9,60** | **6,00** | 183,00 | 30,00 | 14º | 55858 | **57,95** |
| **12,70** | **6,00** | 185,00 | 30,20 | 14º | 55860 | **65,19** |

# Ref. 9268

## FRESA ROTATIVA MD TIPO F OJIVA REDONDEADA
Ball Nosed Tree F Type HM Rotary Burr
Fraise lime rotative carbure type F ogive rayon

**MD**/HM Carbure | **MD**/HM + ALTIN | **Tipo** F Type | **Norma** RBF Norm



**MATERIALES NO FERROSOS**
Non-Ferrous Materials
Matériaux non ferreux

**USO GENERAL**
General Purpose
Utilisation Générale

**VIRUTA CORTA**
Short Chipping
Copeaux Courts

**MATERIALES DUROS**
Hard Materials
Matériaux Durs

| D mm | d mm | L mm | l mm | Dentado Teeth / Denture 1 | | Dentado Teeth / Denture 1 ALTIN | | Dentado Teeth / Denture 3 | | Dentado Teeth / Denture 4 | | Dentado Teeth / Denture 6 | | Dentado Teeth / Denture 6 ALTIN | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | N° Art. MD/HM | € | N° Art. ALTIN | € | N° Art. MD/HM | € | N° Art. MD/HM | € | N° Art. MD/HM | € | N° Art. ALTIN | € |
| **3,00** | **3,00** | 38,00 | 14,00 | 55753 | **11,68** | | | 55750 | **9,75** | | | 17118 | **10,71** | 66503 | **16,69** |
| **6,00** | **6,00** | 50,00 | 18,00 | 55759 | **28,18** | | | 44797 | **23,49** | 44802 | **28,18** | 44808 | **25,82** | 66504 | **31,80** |
| **6,30** | **3,00** | 45,00 | 12,70 | 55758 | **19,17** | | | 55755 | **16,00** | | | 55756 | **17,58** | | |
| **8,00** | **6,00** | 65,00 | 20,00 | 55760 | **34,17** | | | 44798 | **28,49** | 44803 | **34,17** | 44809 | **31,31** | | |
| **9,60** | **6,00** | 64,00 | 19,00 | 55761 | **41,01** | 55880 | **42,96** | 44799 | **34,17** | 44804 | **41,01** | 44811 | **37,54** | 17250 | **39,42** |
| **12,70** | **6,00** | 70,00 | 25,00 | 55762 | **51,23** | 55881 | **59,01** | 44800 | **42,71** | 44805 | **51,23** | 44814 | **46,97** | 23849 | **54,16** |
| **12,70** | **8,00** | 70,00 | 25,00 | 55777 | **45,41** | | | 55774 | **37,87** | | | 55776 | **41,65** | | |
| **16,00** | **6,00** | 70,00 | 25,00 | 55765 | **76,87** | | | 44801 | **64,05** | 44806 | **76,87** | 44817 | **70,47** | | |
| **16,00** | **8,00** | 70,00 | 25,00 | 55782 | **62,70** | | | 55779 | **52,27** | | | 55780 | **57,52** | | |
| **19,00** | **6,00** | 83,00 | 38,00 | 55771 | **121,87** | | | 55768 | **101,65** | | | 55769 | **111,79** | | |

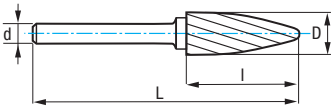
New!

**INOXIDABLES**
Stainless Steels
Aciers Inox

| D mm | d mm | L mm | l mm | Dentado Teeth / Denture M | |
|---|---|---|---|---|---|
| | | | | N° Art. MD/HM | € |
| **9,60** | **6,00** | 64,00 | 19,00 | 20083 | **37,54** |
| **12,70** | **6,00** | 70,00 | 25,00 | 20085 | **46,97** |

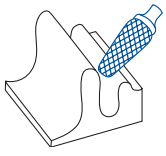
# Ref. 9248

## FRESA ROTATIVA MD TIPO F OJIVA REDONDEADA LARGA
Long Ball Nosed Tree F Type HM Rotary Burr
Fraise lime rotative carbure type F ogive rayon longue




**MD**/HM Carbure | **Tipo** F Type | **Norma** RBF Norm

**MATERIALES DUROS**
Hard Materials
Matériaux Durs



| D mm | d mm | L mm | l mm | Dentado Teeth / Denture 6 | |
|---|---|---|---|---|---|
| | | | | N° Art. MD/HM | € |
| **9,60** | **6,00** | 172,00 | 19,00 | 55855 | **45,37** |
| **12,70** | **6,00** | 178,00 | 25,00 | 55857 | **59,28** |

# Ref. 9200

## JUEGOS FRESAS ROTATIVAS MD
HM Rotary Burr Sets
Jeux fraises limes rotatives carbure

### Mod. 1
5 Pcs

MAT. NO FERROSOS
Non-Ferrous Mat.
Mat. non ferreux

MATERIALES DUROS
Hard Materials
Matériaux Durs

| Cont. (1 x ref.) | D mm | d mm | Dentado Teeth / Denture 1 | | Dentado Teeth / Denture 6 | |
|---|---|---|---|---|---|---|
| | | | N° Art. MD/HM | € | N° Art. MD/HM | € |
| 9260 | | | | | | |
| 9251 | 12,70 | 6,00 | 60052 | 221,52 | 45810 | 203,24 |
| 9255 | | | | | | |
| 9258 | 9,60 | 6,00 | | | 68857 | 153,61 |
| 9266 | | | | | | |

### Mod. 2
10 Pcs

MATERIALES DUROS
Hard Materials
Matériaux Durs

| Cont. (1 x ref.) | D mm | d mm | Dentado Teeth / Denture 6 | |
|---|---|---|---|---|
| | | | N° Art. MD/HM | € |
| 9260 | | | | |
| 9250 | | | | |
| 9251 | | | | |
| 9254 | | | | |
| 9255 | 6,00 | 6,00 | 45811 | 225,49 |
| 9257 | | | | |
| 9258 | | | | |
| 9266 | | | | |
| 9267 | | | | |
| 9268 | | | | |

### Mod. 3
8 Pcs

MATERIALES DUROS
Hard Materials
Matériaux Durs

| Cont. (1 x ref.) | D mm | d mm | Dentado Teeth / Denture 6 | |
|---|---|---|---|---|
| | | | N° Art. MD/HM | € |
| 9260 | | | | |
| 9250 | | | | |
| 9251 | | | | |
| 9254 | 3,00 | 3,00 | 45813 | 95,68 |
| 9257 | | | | |
| 9258 | | | | |
| 9267 | | | | |
| 9268 | | | | |

### Mod. 4
3 Pcs

MATERIALES DUROS
Hard Materials
Matériaux Durs

| Cont. (1 x ref.) | D mm | d mm | Dentado Teeth / Denture 6 | |
|---|---|---|---|---|
| | | | N° Art. MD/HM | € |
| 9260 | | | | |
| 9251 | 9,60 | 6,00 | 79826 | 97,83 |
| 9254 | | | | |

New!

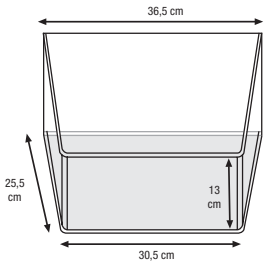
### Mod. 5
5 Pcs

INOXIDABLES
Stainless Steels
Aciers Inox

| Cont. (1 x ref.) | D mm | d mm | Dentado Teeth / Denture M | |
|---|---|---|---|---|
| | | | N° Art. MD/HM | € |
| 9251 | | | | |
| 9254 | 12,70 | 6,00 | 84379 | 206,93 |
| 9257 | | | | |
| 9258 | 9,60 | 6,00 | 84380 | 161,25 |
| 9268 | | | | |

# Expo 9200

**EXPOSITOR FRESAS ROTATIVAS**
Rotary Burr Display
Présentoirs fraises limes rotatives carbure




**Dentado**
**Teeth /** Denture
**6**

| Cont. Ref. | Diam. mm | N° Art. MD/HM | Uds |
|---|---|---|---|
| **9260** | 06,00X06,00 | 44141 | 2 |
| | 08,00X06,00 | 44142 | 2 |
| | 09,60X06,00 | 44143 | 2 |
| | 12,70X06,00 | 44144 | 2 |
| **9251** | 06,00X06,00 | 44438 | 2 |
| | 08,00X06,00 | 44439 | 2 |
| | 09,60X06,00 | 44440 | 2 |
| | 12,70X06,00 | 44441 | 2 |
| **9254** | 06,00X06,00 | 44488 | 2 |
| | 08,00X06,00 | 44494 | 2 |
| | 09,60X06,00 | 44500 | 2 |
| | 12,70X06,00 | 44512 | 2 |
| **9258** | 06,00X06,00 | 44721 | 2 |
| | 08,00X06,00 | 44722 | 2 |
| | 09,60X06,00 | 44723 | 2 |
| | 12,70X06,00 | 44724 | 2 |
| **9267** | 06,00X06,00 | 44792 | 2 |
| | 08,00X06,00 | 44793 | 2 |
| | 10,00X06,00 | 44794 | 2 |
| | 12,70X06,00 | 44795 | 2 |
| **9268** | 06,00X06,00 | 44808 | 2 |
| | 08,00X06,00 | 44809 | 2 |
| | 09,60X06,00 | 44811 | 2 |
| | 12,70X06,00 | 44814 | 2 |

**48 Pcs**

| N° Art. MD/HM | € |
|---|---|
| 57079 | **1.555,06** |

08.

# SIERRAS CINTA - CIRCULARES

## Band Saw Blades - Slitting Saws

## Scies à ruban - Fraises scies


**HOJAS DE SIERRAS DE CINTA**
Band Saw Blades
Lames de scie â ruban 472

**FRESAS SIERRAS CIRCULARES**
Slitting Saws
Fraises scies 484

# SELECCIÓN DE LA HOJA DE SIERRA DE CINTA CORRECTA
## Selecting the right Band Saw Blade
## Selection de la lame de scie à ruban adaptée

### 1. Material del Filo de Corte

Los filos de corte de las sierras de cinta IZAR son bimetálicas HSSE 8% Co (+ 4% Cr segun los casos).

La mecanizabilidad del material a cortar determina el material del filo de corte.

### 1. Material of the Cutting Edge

IZAR band saw blades cutting edges are bimetal HSSE 8% Co (+ 4% Cr in some cases).

The working material machinability determines the cutting edge material.

### 1. Qualités des Rubans

Les rubans des scies IZAR sont bimétaliques HSSE 8% Co (+ 4% Cr selon les cas).

L'usinabilité du matériau déterminera le choix de l'outil.

### 2. Longitud de la Cinta (L)

La dimensión de la cinta depende únicamente de la máquina de corte empleada.

Encontrará información adicional en el manual de instrucciones de la máquina.

### 2. Band Length (L)

The band dimension individually depends on the used cutting machine.

You will find further information in the operation instructions for your machine.

### 2. Longueur de Lame (L)

La dimension d'une lame dépend de la machine utilisée.

Vous trouverez des informations complémentaires dans le manuel d'utilisation de votre machine.

### 3. Ancho de la Cinta (A)

En las máquinas horizontales la anchura de la cinta es especificada por el fabricante.

Las máquinas verticales permiten mayores variaciones en la anchura de la cinta.

Sin embargo, la norma general es que cuanto más ancha es la hoja de sierra de cinta, mayor es su estabilidad.

Para el corte de contornos, el radio más pequeño a cortar es el factor que limita el ancho de la cinta.

### 3. Band Width (A)

With horizontal machines the band width is specified by the manufacturer.

Vertical band saw machines allow higher variations of the band width.

However, the general rule is the wider the band saw blade the higher its stability.

In case of contour cuts the smallest radius to be cut is the limiting factor for the band width.

### 3. Largeur de la Lame (A)

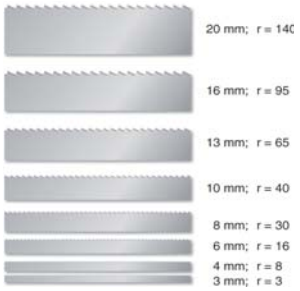
Sur des machines horizontales, la largeur de la lame est spécifiée par le fabricant.

Les machines verticales permettent de plus grandes variations dans les largeurs de lames.

La règle est généralement la suivante: Plus la lame est large, plus la rigidité est importante.

En cas de contournage, la largeur du ruban est limitée par le plus petit rayon à scier.

**Ancho cinta y radio más pequeño**
**Band widths and smallest radius**
Largeurs de lames et plus petit rayon




### 4. Espesor de la Cinta (E)

Cuanto más ancha es la hoja de sierra de cinta, mayor es su espesor.

### 4. Band Thickness (E)

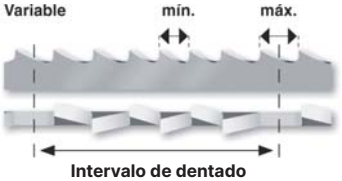
The wider the band saw blade the higher its thickness.

### 4. Epaisseur de Lame (E)

Plus la lame est large, plus la épaisseur est importante.

**Dentado constante**
**Constant tooth pitch** Denture constante

**Dentado variable**
**Variable tooth pitch** Denture variable




**Intervalo de dentado**
**Teeth Interval** Denture

### 5. Dentado (TPI)

El dentado es el n° de dientes por pulgada (25,4 mm).

Los dentados se diferencian en constantes, paso de diente uniforme, y variables, con diferente paso de diente dentro de cada intervalo.

Los dentados variables se definen con dos medidas, p.e. 2-3 TPI.

De forma que, 2 TPI significa el paso de diente máximo, y 3 TPI significa el paso de diente mínimo en el intervalo de dentado.

Aquí, la longitud de contacto de la sierra de cinta con la pieza a cortar es decisiva.

*Las tablas de la pag. 470 muestran los valores límites.

### 5. Tooth pitch (TPI)

Tooth pitch is the number of teeth per inch (25,4 mm).

A difference is made between constant tooth pitches with regular tooth distance and variable tooth pitches with differing tooth distance within one interval.

Variable tooth pitches are marked by two measures, e.g. 2-3 TPI.

With this, 2 TPI signifies the maximum tooth distance and 3 TPI signifies the minimum tooth distance in the toothing interval.

Here the contact length of the blade in the work piece is decisive.

*Both tables on page 470 show the limit values.

### 5. Dentures (TPI)

La denture est au n° de dents par pouce (25,4 mm).

Une différence réside entre les dentures constantes, où l'écart entre deux pointes de dents reste égal et les dentures variables, ou les valeurs des pas de dents sont différentes.

La denture variable est caractérisée par deux chiffres, par exemple: 2-3 TPI.

Le chiffre 2 TPI désigne l'écart maxi entre les dents et le chiffre 3 TPI l'écart mini entre les dents sur une séquence de denture.

La surface de contact de la lame sur la pièce à débiter est décisive.

*Les tableaux (page 470) vous permettront de choisir aisément la denture adaptée à votre cas.

## 6. Forma Diente (TZ)

Nuestras diferentes formas de dientes han sido combinadas de forma óptima por nuestros técnicos, teniendo en cuenta nuestros materiales del filo de corte y las dimensiones de las máquinas.

### Diente estándar (S)

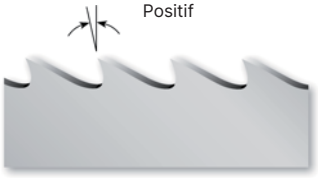
Angulo desprendimiento 0°:

- materiales de viruta corta
- aceros de alto contenido en carbono
- preferiblemente acero de herramienta y hierro fundido
- materiales de poca sección de corte
- perfiles de pared delgada

### Diente para perfil (P)

Angulo desprendimiento positivo para mayor productividad:

- perfiles huecos y angulares
- vigas
- cortes de paquetes y capas
- tareas de corte sujetas a aparición de vibraciones




### Diente de garra (K)

Angulo de desprendimiento positivo para macizos:

- empleo universal
- metales no ferrosos y aceros con un contenido en carbono de < 0,8%
- aceros estructurales, aceros para extrusión en frío y aceros templados

### Diente trapezoidal (T)

Ángulo de ataque positivo para un alto rendimiento de corte y un acabado óptimo.

## 6. Tooth Shape (TZ)

Our different tooth shapes have been optimally combined with our cutting edge materials and band saw dimensions by our technologists.

### Raker tooth (S)

0° rake angle for:

- short-chipping materials
- steels with high carbon content
- preferably tool steel and cast iron
- materials with small cross-sections
- thin-walled profiles

### Profile tooth (P)

Positive rake angle for higher productivity:

- hollow and angle profiles
- beams
- bundle and layer cuts
- applications that are susceptible to vibrations

### Hook tooth (K)

Positive rake angle for solids:

- universal use
- non-ferrous metals and steels with a carbon content of < 0,8%
- structural steels, steels for cold extrusion, tempered steels

### Trapezoid Tooth (T)

Positive rake angle for a high cutting performance and an optimal surface finishing.

## 6. Forme de Dent (TZ)

Nos différentes formes de dents sont optimisées, selon la qualité des lames et leurs dimensions, par nos ingénieurs.

### Dent standard (S)

Angle de coupe 0° pour:

- matériaux à copeaux courts
- aciers à forte teneur en carbone
- les fontes et aciers à outil
- pièces de petites sections
- profils à parois minces

### Dent profilée (P)

Angle de coupe positif pour meilleure productivité:

- tubes et profils
- poutrelles
- coupes en nappes et en paquets
- pièces sensibles aux vibrations

### Dent griffe (K)

Angle de coupe positif pour matériaux pleins:

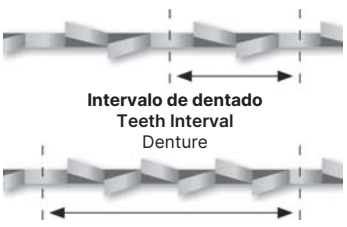
- usage universel
- métaux non ferreux et aciers à teneur en carbone de < 0,8%
- aciers de construction, aciers pour extrusion à froid et aciers trempés

### Dent trapèze (T)

Angle de coupe positif pour coupe à haut rendement et meilleur état de surface.

## 7. Tipos de Triscado (TR)

A través del triscado, con el que los dientes sobresalen alternativamente a izquierda y derecha del fleje de la cinta, se logra el corte de la hoja de sierra de cinta.




### Triscado estándar (SD)

El triscado estándar es un triscado multiuso para cortar espesores de más de 5 mm de aceros, fundición y metales duros no ferrosos.

En el dentado constante la secuencia es izquierda / derecha / recto.

En el dentado variable, hay un diente no triscado por cada intervalo de dentado.

Los dientes restantes del intervalo, están triscados repetidamente a izquierda / derecha.

## 7. Types of Tooth Set (TR)

By means of the tooth set, where the teeth protrude alternately left and right beyond the blade body, free-cutting action of the band saw blade is achieved.

### Standard set (SD)

The standard set is an all-purpose set for cutting thicknesses of more than 5 mm of steels, castings and hard non-ferrous metals.

With constant tooth pitch the set sequence is left / right / straight.

With variable tooth pitch one tooth in each toothing interval is unset.

The remaining teeth in the interval are recurrently set left / right.

## 7. Types d'Avoyages (TR)

Par avoyage d'une lame de scie, on entend le déport bilatéral des dents de celle-ci par rapport au dossier.

L'avoyage est destiné à assurer le dégagement de la lame.

### Avoyage standard (SD)

L'avoyage standard est utilisé pour les aciers, les fontes, les métaux non ferreux dont l'épaisseur est supérieure à 5 mm.

Pour les dentures constantes, l'avoyage est gauche / droite / centre.

Pour les dentures variables, une seule dent est au centre tandis que les autres dents sont déportées alternativement à gauche et à droite.

# SELECCIÓN DE LA HOJA DE SIERRA DE CINTA CORRECTA
Selecting the right Band Saw Blade
Selection de la lame de scie à ruban adaptée

| ESPESOR DE LA PARED Wall Thickness Épaisseur de paroi | DIÁMETRO EXTERIOR DE TUBO (MM) / Pipe External Diameter (mm) / Diametre extérieure du tube (mm) DIENTES POR PULGADA / t.p.i. / d.p.p. | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 20 | 40 | 60 | 80 | 100 | 120 | 150 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1500 |
| 2 | 14 | 14 | 14 | 14 | 14 | 14 | 10-14 | 10-14 | 8-12 | 8-12 | 6-10 | 6-10 | 5-8 | 5-8 | 5-8 | 5-8 | 5-8 |
| 3 | 14 | 14 | 10-14 | 10-14 | 10-14 | 10-14 | 8-12 | 8-12 | 6-10 | 6-10 | 5-8 | 5-8 | 5-8 | 4-6 | 4-6 | 4-6 | 4-6 |
| 4 | 14 | 14 | 10-14 | 10-14 | 8-12 | 8-12 | 8-12 | 8-12 | 5-8 | 5-8 | 4-6 | 4-6 | 4-6 | 4-6 | 4-6 | 4-6 | 3-4 |
| 5 | 14 | 10-14 | 10-14 | 8-12 | 8-12 | 8-12 | 6-10 | 6-10 | 5-8 | 5-8 | 4-6 | 4-6 | 4-6 | 3-4 | 3-4 | 3-4 | 3-4 |
| 6 | 14 | 10-14 | 10-14 | 8-12 | 8-12 | 8-12 | 8-12 | 5-8 | 5-8 | 4-6 | 4-6 | 4-6 | 3-4 | 3-4 | 3-4 | 3-4 | 3-4 |
| 8 | 14 | 10-14 | 8-12 | 8-12 | 8-12 | 6-10 | 6-10 | 5-8 | 4-6 | 4-6 | 4-6 | 3-4 | 3-4 | 3-4 | 3-4 | 2-3 | 2-3 |
| 10 | | 8-12 | 6-10 | 6-10 | 6-10 | 5-8 | 5-8 | 4-6 | 4-6 | 4-6 | 3-4 | 3-4 | 3-4 | 3-4 | 2-3 | 2-3 | 2-3 |
| 12 | | 8-12 | 6-10 | 6-10 | 5-8 | 5-8 | 4-6 | 4-6 | 4-6 | 3-4 | 3-4 | 3-4 | 3-4 | 2-3 | 2-3 | 2-3 | 2-3 |
| 15 | | 8-12 | 6-10 | 5-8 | 5-8 | 4-6 | 4-6 | 4-6 | 3-4 | 3-4 | 3-4 | 2-3 | 2-3 | 2-3 | 2-3 | 2-3 | 2-3 |
| 20 | | | 6-10 | 5-8 | 4-6 | 4--6 | 4-6 | 3-4 | 3-4 | 3-4 | 2-3 | 2-3 | 2-3 | 2-3 | 2-3 | 2-3 | 2-3 |
| 30 | | | | 4-6 | 4-6 | 4-6 | 3-4 | 3-4 | 3-4 | 2-3 | 2-3 | 2-3 | 2-3 | 2-3 | 2-3 | 2-3 | 1,4-2 |
| 50 | | | | | | 3-4 | 3-4 | 3-4 | 2-3 | 2-3 | 2-3 | 2-3 | 2-3 | 2-3 | 1,4-2 | 1,4-2 | 1,4-2 |
| 75 | | | | | | | | 2-3 | 2-3 | 2-3 | 2-3 | 2-3 | 1,4-2 | 1,4-2 | 1,4- 2 | 1,4-2 | 1,4-2 |
| 100 | | | | | | | | | 2-3 | 2-3 | 1,4-2 | 1,4-2 | 1,4-2 | 1,4-2 | 1,4-2 | 1,4-2 | 1,4-2 |
| 150 | | | | | | | | | | 2-3 | 1,4-2 | 1,4-2 | 1,4-2 | 1,4-2 | 1,0-1,4 | 1,0-1,4 | 1,0-1,4 |
| 200 | | | | | | | | | | | 1,4-2 | 1,4-2 | 1,4-2 | 1,0-1,4 | 1,0-1,4 | 1,0-1,4 | 0,75-1,25 |
| 250 | | | | | | | | | | | | 1,4-2 | 1,0-1,4 | 1,0-1,4 | 1,0-1,4 | 0,75-1,25 | 0,75-1,25 |
| 300 | | | | | | | | | | | | | 1,0-1,4 | 1,0-1,4 | 0,75-1,25 | 0,75-1,25 | 0,75-1,25 |

## ELECCIÓN DEL DENTADO CORRECTO PARA MACIZOS
**Selecting the correct tooth pitch for solids**
Élection de la denture correcte pour matériaux pleins

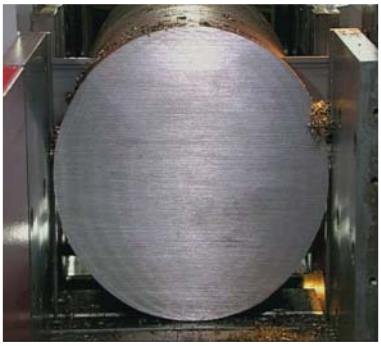


**Tabla selección dentado**
**Tooth selection table**
Tableau sélection denture

| Dentado Tooth Denture | Perfil Profile Profil | Macizo Solid Plein |
|---|---|---|
| 10 / 14 | 0-1 mm | 0-10 mm |
| 8 / 12 | 1-2,5 mm | 10-20 mm |
| 6 / 10 | 2,5-5 mm | 20-40 mm |
| 5 / 8 | 5-7 mm | 40-50 mm |
| 4 / 6 | 7-10 mm | 50-90 mm |
| 3 / 4 | >10 mm | 90-120 mm |
| 2 / 3 | | >120 mm |
| 1,4 / 2 | | >250 mm |

### DENTADO CONSTANTE
**Constant Tooth Pitch** Denture constante

| Dentado t.p.i./d.p.p. | LONGITUD DE CONTACTO Contact length / Longueur de contact INTERVALO DE DENTADO Toothing interval / Intervalle des dents |
|---|---|
| 24 | 6 |
| 18 | 10 |
| 14 | 15 |
| 10 | 15 - 30 |
| 8 | 30 - 50 |
| 6 | 50 - 80 |
| 4 | 80 - 120 |
| 3 | 120 - 200 |
| 2 | 200 - 400 |
| 1,25 | 300 - 800 |

**Los dentados constantes son adecuados para materiales macizos.**

**Constant tooth pitches are suitable for solid materials.**

Les dentures constantes sont appropiées pour des maténaux pleins.

### DENTADO VARIABLE
**Variable Tooth Pitch** Denture variable

| Dentado t.p.i./d.p.p. | LONGITUD DE CONTACTO Contact length / Longueur de contact INTERVALO DE DENTADO Toothing interval / Intervalle des dents |
|---|---|
| 10-14 | 30 |
| 8-12 | 20 - 50 |
| 6-10 | 25 - 60 |
| 5-8 | 35 - 80 |
| 4-6 | 50 - 100 |
| 4-5 | 70 - 120 |
| 3-4 | 80 - 150 |
| 2-3 | 120 - 350 |
| 1,4-2 | 250 - 600 |
| 1,0-1,4 | 400 - 1000 |
| 0.75-1,25 | 700 - 1400 |
| 0.7-1,0 | 900 - 3000 |

**Los dentados variables son recomendados para suprimir los fenómenos de resonancia y las vibraciones.**

**Variable tooth pitches are recommended to suppress the resonance phenomenons and vibrations.**

Les dentures variables sont recommandées pour suprimer les phénomenes de resonance et les vibrations.

## PREVENCIÓN DE PROBLEMAS
**Preventive Measures** Prevention des problemes

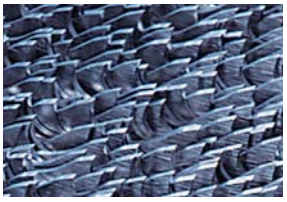
**1- Elija la hoja de sierra adecuada (Ref., L, AxE, TPI, TZ, TR) para su máquina y para el material a cortar.**
**2- Ciñase a las condiciones de corte adecuadas (Vc, refrigeración) para cada material.**
**3- Ajuste la tensión de la hoja de sierra en la máquina a 43.500 psi / 300 N/mm².**
**4- Revise la máquina: estado de las guías laterales y de apoyo, posición del cepillo limpiaviruta...**
**5- Haga un rodaje de la hoja de sierra (avance al 50%) para eliminar la arista viva del diente, durante 300 cm² en piezas pequeñas ó 15 min. en piezas de grandes dimensiones.**

**1- Select the right band saw blade (Ref., L, AxE, TPI, TZ, TR) for your machine and the cutting material.**
**2- Keep to the right cutting conditions (Vc, cooling) for each material.**
**3- Adjust the band saw blade tension in the machine to 43.500 psi / 300 N/mm².**
**4- Check the machine: side & support slides condition, chip-removing brush position...**
**5- Make a run of the band saw blade (50% feed) to remove the tooth sharp edge, for 300 cm² with small pieces or 15 min. with big ones.**

1- Choisissez la lame de scie plus convenable (Ref., AxE, TPI, TZ, TR) pour votre machine et le matériel à couper.
2- Mettez les conditions de coupe correctes (Vc, refrigeration) pour chaque materiel.
3- Ajustez la tension de chaque lame de scie sur la machine a 43.500 psi / 300 N/mm².
4- Revisez la machine: état des guides latérales et d´appui, position de la brosse pour nettoyer les copeaux...
5- Faites le rodage de la lame de scie (avance au 50%) pour elliminer les aretes vives du dent, pendant 300 cm² sur des pièces petites où 15 min. en pièces grandes.

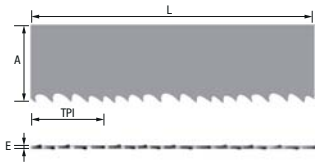
## MATERIALES Y VELOCIDADES DE CORTE Materials And Cutting Speeds Matières et Vitesses de Coupe

| | | GRUPO DE MATERIAL / Material / Matiére | DIN | VELOCIDAD (mtrs./min.) Speed / Vitesse | REFRIGERACIÓN (%) Coolant / Lubrification |
|---|---|---|---|---|---|
| P | P.1 | **Aceros construcción** / **Construction steels** / Aciers de construction | St 37/St 42 | 60-90 | 10 |
| | | | St 52/St 60 | 50-80 | 10 |
| | | **Aceros cementación** / **Case-hardening steels** / Aciers de cémentation | C 10/C 15 | 65-105 | 15 |
| | | | 21 Ni Cr Mo 2 | 40-60 | 10 |
| | | | 16 Mn Cr 5 | 40-70 | 10 |
| | | **Aceros de construcción fundidos** / **Cast steels** / Aciers de construction fonte | GS - 38 | 40-70 | 3 |
| | | | GS - 60 | 35-60 | 3 |
| | P.2 | **Aceros nitruración** / **Nitriding steels** / Aciers de nitruration | 34 Cr Al 6 | 20-45 | 5 |
| | | **Aceros bonificados** / **Alloyed heat-treatable steels** / Aciers supérieurs | C 35 / C 45 | 40-90 | 5 |
| | | | 34 Cr Ni Mo 6 | 40-70 | 5 |
| | | | 42 Cr Mo 4 | 40-70 | 5 |
| | | **Aceros aleados para herramientas** / **Alloyed tool steels** / Aciers alliés por outils | 100 Cr 6 | 30-75 | 3 |
| | | | 100 Cr Mo 7 3 | 30-60 | 3 |
| | | **Aceros para muelles** / **Spring steels** / Aciers pour ressorts | 65 Si 7 | 30-70 | 3 |
| | | | 50 Cr V 4 | 30-70 | 3 |
| | | | C 80 W 1 | 35-70 | 3 |
| | | **Aceros aleados para herramientas** / **Alloyed tool steels** / Aciers alliés por outils | 125 Cr 1 | 30-65 | 3 |
| | | | X 210 Cr 12 | 15-40 | **Seco** / **Dry** / À sec |
| | | | X 155 Cr V Mo 12 1 | 15-40 | **Seco** / **Dry** / À sec |
| | | | 90 Mn Cr V 8 | 20-45 | 3 |
| | | **Aceros rápidos** / **High speed steels** / Aciers rapides | S 6 - 5 - 2 | 25-50 | 3 |
| | | | S3- 3 - 2 | 30-55 | 3 |
| | | | S2- 10 - 1 - 8 | 20-45 | 3 |
| | | | S18 - 0 - 1 | 20-45 | 3 |
| | | | S10-4-3-10 | 20-45 | 3 |
| | P.3 | **Aceros para válvulas** / **Valve steels** / Aciers pour soupapes | X 45 Cr Si 93 | 25-55 | 5 |
| | | | X 45 Cr Ni W 18 9 | 20-50 | 5 |
| | | **Aceros altamente refractarios** / **High temperature steels** / Aciers trés refractaires | X 12 Cr Co Ni 21 20 | 15-30 | 10 |
| | | | X 20 Cr Mo WV 12 1 | 25-40 | 10 |
| | | **Aceros refractarios** / **Heat-resistant steels** / Aciers refractaires | X 15 Cr Ni Si 25 20 | 10-25 | 15 |
| | | | X 12 Ni Cr Si 36 16 | 10-25 | 15 |
| | | **Aceros bonificados** / **Alloyed heat-treatable steels** / Aciers supérieurs | 1000 -1200 N/mm² | 20-35 | 5 |
| | | | 1200 -1 400 N/mm² | 15-30 | 5 |
| | | | 1400 -1 600 N/mm² | 10-25 | 5 |
| M | | **Aceros Inox. austeníticos** / **Austenitic stainless steel** / Aciers inox austénitiques | X 5 Cr Ni 18 10 | 20-50 | 10 |
| | | | X 6Cr Ni Mo Ti 17 12 2 | 20-50 | 10 |
| K | | **Fundición** / **Cast** / Fonte | GG - 30 | 30-60 | **Seco** / **Dry** / À sec |
| | | | GGG - 50 | 25-55 | **Seco** / **Dry** / À sec |
| S | | **Titanio puro** / **Unalloyed titanium** / Titane pur | Ti 1 | 15-45 | 10 |
| N | N.1 | **Cobre** / **Copper** / Cuivre | Ke - Cu | 60-200 | 10 |
| | | **Latón** / **Brass** / Laiton | Cu Zn 40 | 80-300 | 3 |
| | | | Cu Zn 40 Pb 2 | 80-300 | 3 |
| | | | Cu Zn 15 Si 4 | 80-300 | 3 |
| | | **Bronces Estaño** / **Tin bronze** / Bronze | Cu Sn 6 | 80-160 | 3 |
| | | | Cu Sn 8 | 80-160 | 3 |
| | | **Fundición Bronce** / **Bronze casting** / Fonte de bronze | Cu Sn 5 Zn Pb | 60-150 | 3 |
| | | | Cu Sn 10 Zn | 60-150 | 3 |
| | N.2 | **Bronce Aluminio*** / **Aluminium bronze*** / Bronze Aluminium* | Cu Al 8 | 40-60 | 15 |
| | | | Cu Al 10 Fe | 30-40 | 15 |
| | | | AMPCO 18 | 40-65 | 15 |
| | | | AMPCO 25 | 30-50 | 15 |
| | N.3 | **Aluminio sin alear** / **Unalloyed aluminium** / Aluminium sans alliage | Al 99,8 | 80-800 | 25 |
| | N.4 | **Aleación ligera** / **Aluminium ligth alloy** / Faible alliage d'aluminium | Al Mg 3 | 80-800 | 25 |
| | | | Al Mg 4,5 Mn | 80-800 | 25 |
| | N.5 | **Fundición aleada de Aluminio** / **Aluminium cast alloy** / Fonte alliée d'aluminium | G - Al Si 6 Cu 4 | 80-800 | 25 |
| | | | G - Al Si 12 | 80-800 | 25 |
| | | | G -Al Mg3 | 80-800 | 25 |
| | | | G - Al Cu 4 Ti | 80-800 | 25 |
| | N.6 | **Materias Sintéticas Termoplásticas** **Thermoplastic plastics** / Termoplastiques plastiques | PVC | 100-400 | **Seco** / **Dry** / À sec |
| | | | Teflón | 100-400 | **Seco** / **Dry** / À sec |
| | | | Hostalen | 100-400 | **Seco** / **Dry** / À sec |
| | | | Polystyrol | 100-400 | **Seco** / **Dry** / À sec |
| | | **Aceros tornos automáticos** / **Automatic steels** / Aciers de décolletage | 9 S 20 | 60-120 | 15 |
| | | **Aceros para hta. sin alear** / **Unalloyed tool steels** / Aciers pour outils non alliés | C 125 W | 30-65 | 3 |
| | | **Aleaciones especiales** / **Special alloys** / Alliages spéciaux | Inconel 718 | 8-20 | 20 |
| | | | Hastelloy B | 10-25 | 12 |
| | | | Nimonic 901 | 8-20 | 20 |
| | | | Nimonic 263 | 10-22 | 15 |
| | | | Incoloy 840 | 11-23 | 15 |
| | | **Aceros templados** / **Hardened steels** / Aciers trempés | 50 HRC | - | 5 |
| | | | 55 HRC | - | 5 |
| | | | 60 HRC | - | 5 |
| | | **Aleación** / **Alloy** / Alliage | (Ni Cr Mo) | 15-40 | **Seco** / **Dry** / À sec |
| | | **Bronce estaño Plomo** / **Tin bronze lead** / Bronze étain plomb | Cu Pb 20 SnS | 80-160 | 3 |



# Ref. 4223

## HOJA DE SIERRA DE CINTA HSSE 8% Co IZARFLEX
IZARFLEX HSSE 8% Co Band Saw Blade
Lame de scie à ruban HSSE 8% Co IZARFLEX

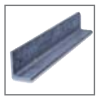
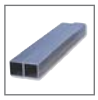



**Ideal para trabajos de taller exigentes, con los dientes de una calidad especial resistente al desgaste. Fleje flexible, bimetal, combina dentados 0 y +**

**Ideal for heavy duty whorkshop cutting tasks, with special wear resistant quality teeth. Flexible strip, bimetal, 0 & + teeth combined.**

Idéal pour des travaux d´atelier exigeants, avec dents d´une qualité spéciale resistante à l´usure. Feuillard flexible, bimétal, possibilité dentures 0 et +

HSSE 8% Co

| Grupo Group-Groupe | Subgrup. |
|---|---|
| P | P.1 P.2 |

| Grupo Group-Groupe |
|---|
| N |

New!

| L mm | A mm | E mm | 8% Co € 1 ud. |
|---|---|---|---|
| 1030 | 13 | 0,65 | 3 | 18,01 |
| 1080 | | | | 18,89 |
| 1104 | | | | 19,30 |
| 1115 | | | | 19,50 |
| 1125 | | | | 19,67 |
| 1130 | | | | 19,79 |
| 1138 | | | | 19,89 |
| 1140 | | | | 19,94 |
| 1270 | | | | 21,00 |
| 1300 | | | | 21,50 |
| 1310 | | | | 21,59 |
| 1325 | | | | 21,71 |
| 1328 | | | | 21,73 |
| 1330 | | | | 21,76 |
| 1335 | | | | 21,78 |
| 1340 | | | | 21,85 |
| 1350 | | | | 21,99 |
| 1365 | | | | 22,06 |
| 1385 | | | | 22,24 |
| 1400 | | | | 22,48 |
| 1410 | | | | 23,05 |
| 1425 | | | | 22,89 |
| 1435 | | | | 23,05 |
| 1440 | | | | 23,13 |
| 1445 | | | | 23,20 |
| 1450 | | | | 23,26 |
| 1460 | | | | 23,83 |
| 1470 | | | | 24,41 |
| 1480 | | | | 24,42 |
| 1490 | | | | 24,59 |
| 1514 | | | | 24,69 |
| 1525 | | | | 24,73 |
| 1550 | | | | 24,86 |
| 1575 | | | | 24,99 |
| 1580 | | | | 25,03 |
| 1600 | | | | 25,14 |
| 1620 | | | | 25,26 |
| 1630 | | | | 25,30 |
| 1635 | | | | 25,40 |
| 1638 | | | | 25,44 |
| 1640 | | | | 25,46 |
| 1645 | | | | 25,52 |
| 1650 | | | | 25,61 |
| 1660 | | | | 25,78 |
| 1710 | | | | 26,18 |
| 1715 | | | | 26,25 |

New!

| L mm | A mm | E mm | 8% Co € 1 ud. |
|---|---|---|---|
| 1718 | 13 | 0,65 | 3 | 26,31 |
| 1728 | | | | 26,46 |
| 1730 | | | | 26,49 |
| 1735 | | | | 26,56 |
| 1740 | | | | 26,64 |
| 1745 | | | | 26,73 |
| 1750 | | | | 26,80 |
| 1770 | | | | 27,12 |
| 1790 | | | | 27,42 |
| 1838 | | | | 28,15 |
| 1840 | | | | 28,17 |
| 1845 | | | | 28,25 |
| 1875 | | | | 28,72 |
| 2100 | | | | 29,23 |
| 2120 | | | | 29,51 |
| 2125 | | | | 29,58 |
| 2150 | | | | 29,92 |
| 2230 | | | | 31,04 |
| 2240 | | | | 31,16 |
| 2242 | | | | 31,20 |
| 2250 | | | | 31,31 |
| 2290 | | | | 31,87 |
| 2390 | | | | 32,42 |
| 2440 | | | | 33,11 |
| 2490 | | | | 33,79 |
| 2500 | | | | 33,93 |
| 2550 | | | | 34,60 |
| 2560 | | | | 34,70 |
| 2580 | | | | 35,01 |
| 2650 | | | | 35,62 |
| 2735 | | | | 36,36 |
| 2750 | | | | 36,55 |
| 2800 | | | | 37,05 |
| 2840 | | | | 37,54 |
| 2845 | | | | 37,62 |
| 2890 | | | | 38,24 |
| 2900 | | | | 38,36 |
| 3115 | | | | 40,57 |
| 3140 | | | | 40,86 |
| 3160 | | | | 41,09 |
| 3200 | | | | 41,52 |
| 3355 | | | | 43,25 |
| 3370 | | | | 43,44 |
| 3420 | | | | 44,08 |
| 3430 | | | | 44,22 |
| 3590 | | | | 46,28 |

New!

| L mm | A mm | E mm | 8% Co € 1 ud. |
|---|---|---|---|
| 3600 | 13 | 0,65 | 3 | 46,41 |
| 3830 | | | | 48,46 |
| 3857 | | | | 48,80 |
| 4100 | | | | 50,23 |
| 4180 | | | | 51,21 |
| 4400 | | | | 53,80 |
| 4440 | | | | 54,22 |
| 4600 | | | | 56,23 |
| 5140 | | | | 62,83 |
| 1350 | 20 | 0,90 | 2 | 24,01 |
| 1710 | | | | 28,94 |
| 1735 | | | | 29,36 |
| 1740 | | | | 29,45 |
| 1750 | | | | 29,61 |
| 2000 | | | | 31,78 |
| 2005 | | | | 32,71 |
| 2010 | | | | 33,65 |
| 2020 | | | | 33,80 |
| 2035 | | | | 34,22 |
| 2037 | | | | 34,28 |
| 2040 | | | | 34,32 |
| 2058 | | | | 34,65 |
| 2060 | | | | 34,67 |
| 2065 | | | | 34,73 |
| 2070 | | | | 34,78 |
| 2075 | | | | 34,87 |
| 2080 | | | | 34,94 |
| 2085 | | | | 34,99 |
| 2090 | | | | 35,07 |
| 2095 | | | | 35,13 |
| 2100 | | | | 35,18 |
| 2110 | | | | 35,34 |
| 2115 | | | | 35,42 |
| 2120 | | | | 35,50 |
| 2130 | | | | 39,52 |
| 2140 | | | | 35,76 |
| 2215 | | | | 36,64 |
| 2225 | | | | 36,79 |
| 2240 | | | | 37,06 |
| 2265 | | | | 37,45 |
| 2300 | | | | 38,04 |
| 2350 | | | | 38,59 |
| 2355 | | | | 38,68 |
| 2360 | | | | 38,75 |
| 2362 | | | | 38,77 |
| 2365 | | | | 38,83 |

New!

| L mm | A mm | E mm | 8% Co € 1 ud. |
|---|---|---|---|
| 2370 | 20 | 0,90 | 2 | 38,90 |
| 2375 | | | | 38,95 |
| 2380 | | | | 39,06 |
| 2400 | | | | 39,37 |
| 2450 | | | | 39,93 |
| 2465 | | | | 40,18 |
| 2470 | | | | 40,26 |
| 2480 | | | | 40,43 |
| 2490 | | | | 40,59 |
| 2520 | | | | 40,92 |
| 2530 | | | | 41,07 |
| 2540 | | | | 41,23 |
| 2542 | | | | 41,26 |
| 2560 | | | | 41,55 |
| 2600 | | | | 42,21 |
| 2610 | | | | 42,36 |
| 2625 | | | | 42,61 |
| 2630 | | | | 42,69 |
| 2650 | | | | 43,01 |
| 2665 | | | | 43,27 |
| 2710 | | | | 44,00 |
| 2750 | | | | 44,64 |
| 2770 | | | | 44,96 |
| 2950 | | | | 45,93 |
| 2970 | | | | 46,05 |
| 2980 | | | | 46,11 |
| 3000 | | | | 46,23 |
| 3084 | | | | 46,64 |
| 3240 | | | | 47,51 |
| 3280 | | | | 48,10 |
| 3454 | | | | 50,24 |
| 3950 | | | | 55,89 |
| 3960 | | | | 56,30 |
| 4000 | | | | 56,87 |
| 4185 | | | | 59,20 |
| 4270 | | | | 60,41 |
| 4400 | | | | 62,25 |
| 4485 | | | | 63,46 |
| 4665 | | | | 65,99 |
| 4700 | | | | 66,49 |
| 4900 | | | | 69,32 |
| 5130 | | | | 72,58 |
| 5800 | | | | 78,72 |
| 7220 | | | | 102,15 |
| 7320 | | | | 103,56 |

Ref. **4223**

## HOJA DE SIERRA DE CINTA HSSE 8% Co IZARFLEX
IZARFLEX HSSE 8% Co Band Saw Blade
Lame de scie à ruban HSSE 8% Co IZARFLEX

| New! | | | | |
|---|---|---|---|---|
| L mm | A mm | E mm | | 8% Co € 1 ud. |
| 2060 | 27 | 0,90 | 2 | 35,26 |
| 2070 | | | | 35,44 |
| 2080 | | | | 35,59 |
| 2085 | | | | 35,68 |
| 2090 | | | | 35,85 |
| 2100 | | | | 35,98 |
| 2115 | | | | 36,17 |
| 2110 | | | | 36,09 |
| 2140 | | | | 36,44 |
| 2145 | | | | 36,52 |
| 2150 | | | | 36,60 |
| 2155 | | | | 36,71 |
| 2355 | | | | 39,33 |
| 2360 | | | | 39,41 |
| 2375 | | | | 39,64 |
| 2400 | | | | 40,06 |
| 2410 | | | | 40,22 |
| 2440 | | | | 40,72 |
| 2445 | | | | 40,80 |
| 2448 | | | | 40,85 |
| 2450 | | | | 40,88 |
| 2455 | | | | 40,95 |
| 2459 | | | | 41,00 |
| 2460 | | | | 41,01 |
| 2465 | | | | 41,10 |
| 2470 | | | | 41,17 |
| 2480 | | | | 41,30 |
| 2485 | | | | 41,39 |
| 2500 | | | | 41,65 |
| 2515 | | | | 41,90 |
| 2520 | | | | 41,98 |
| 2535 | | | | 42,09 |
| 2540 | | | | 42,12 |
| 2550 | | | | 42,29 |
| 2560 | | | | 42,44 |
| 2565 | | | | 42,52 |
| 2570 | | | | 42,59 |
| 2580 | | | | 42,75 |
| 2590 | | | | 42,82 |
| 2600 | | | | 43,01 |
| 2615 | | | | 43,27 |
| 2625 | | | | 43,44 |
| 2645 | | | | 43,58 |
| 2655 | | | | 43,65 |
| 2660 | | | | 43,72 |
| 2680 | | | | 44,18 |
| 2700 | | | | 44,44 |
| 2710 | | | | 44,62 |
| 2715 | | | | 44,70 |
| 2720 | | | | 44,79 |
| 2725 | | | | 44,87 |
| 2730 | | | | 44,94 |
| 2735 | | | | 45,02 |
| 2740 | | | | 45,10 |
| 2750 | | | | 45,16 |
| 2755 | | | | 45,24 |
| 2759 | | | | 47,28 |
| 2760 | | | | 45,30 |
| 2765 | | | | 45,36 |
| 2770 | | | | 45,45 |

| New! | | | | |
|---|---|---|---|---|
| L mm | A mm | E mm | | 8% Co € 1 ud. |
| 2795 | 27 | 0,90 | 2 | 45,73 |
| 2800 | | | | 45,81 |
| 2810 | | | | 45,99 |
| 2820 | | | | 46,15 |
| 2825 | | | | 46,23 |
| 2830 | | | | 46,30 |
| 2835 | | | | 46,38 |
| 2840 | | | | 46,44 |
| 2845 | | | | 46,53 |
| 2847 | | | | 46,57 |
| 2850 | | | | 46,62 |
| 2855 | | | | 46,70 |
| 2860 | | | | 46,77 |
| 2865 | | | | 46,82 |
| 2870 | | | | 46,88 |
| 2880 | | | | 46,96 |
| 2884 | | | | 47,02 |
| 2890 | | | | 47,10 |
| 2900 | | | | 47,26 |
| 2910 | | | | 47,45 |
| 2915 | | | | 47,50 |
| 2920 | | | | 47,58 |
| 2925 | | | | 47,66 |
| 2927 | | | | 47,69 |
| 2930 | | | | 47,74 |
| 2940 | | | | 47,83 |
| 2945 | | | | 47,92 |
| 2950 | | | | 48,02 |
| 2960 | | | | 48,17 |
| 2964 | | | | 48,25 |
| 2965 | | | | 48,26 |
| 2985 | | | | 48,46 |
| 3000 | | | | 48,72 |
| 3010 | | | | 48,88 |
| 3015 | | | | 48,96 |
| 3020 | | | | 49,02 |
| 3025 | | | | 49,11 |
| 3035 | | | | 49,29 |
| 3050 | | | | 49,52 |
| 3084 | | | | 49,87 |
| 3090 | | | | 50,00 |
| 3100 | | | | 50,17 |
| 3110 | | | | 50,29 |
| 3120 | | | | 50,46 |
| 3140 | | | | 50,72 |
| 3150 | | | | 50,87 |
| 3160 | | | | 51,03 |
| 3175 | | | | 51,24 |
| 3180 | | | | 51,32 |
| 3200 | | | | 51,64 |
| 3215 | | | | 51,87 |
| 3220 | | | | 51,96 |
| 3230 | | | | 52,12 |
| 3250 | | | | 52,44 |
| 3270 | | | | 52,56 |
| 3280 | | | | 52,62 |
| 3285 | | | | 52,65 |
| 3300 | | | | 52,89 |
| 3310 | | | | 53,03 |

| New! | | | | |
|---|---|---|---|---|
| L mm | A mm | E mm | | 8% Co € 1 ud. |
| 3320 | 27 | 0,90 | 2 | 53,20 |
| 3345 | | | | 53,61 |
| 3350 | | | | 53,69 |
| 3352 | | | | 53,72 |
| 3365 | | | | 53,94 |
| 3370 | | | | 54,02 |
| 3378 | | | | 54,15 |
| 3380 | | | | 54,17 |
| 3400 | | | | 54,45 |
| 3420 | | | | 54,72 |
| 3430 | | | | 54,87 |
| 3435 | | | | 54,95 |
| 3440 | | | | 55,03 |
| 3460 | | | | 55,20 |
| 3490 | | | | 55,50 |
| 3495 | | | | 55,54 |
| 3500 | | | | 55,62 |
| 3505 | | | | 55,69 |
| 3550 | | | | 56,41 |
| 3560 | | | | 56,58 |
| 3600 | | | | 57,21 |
| 3630 | | | | 57,68 |
| 3640 | | | | 57,83 |
| 3650 | | | | 58,00 |
| 3660 | | | | 58,16 |
| 3667 | | | | 58,27 |
| 3670 | | | | 58,32 |
| 3700 | | | | 58,80 |
| 3800 | | | | 60,15 |
| 3810 | | | | 60,31 |
| 3820 | | | | 60,46 |
| 3830 | | | | 60,62 |
| 3850 | | | | 60,93 |
| 3851 | | | | 60,96 |
| 3853 | | | | 60,98 |
| 3900 | | | | 61,73 |
| 3930 | | | | 62,20 |
| 3950 | | | | 62,51 |
| 4000 | | | | 63,30 |
| 4038 | | | | 63,71 |
| 4050 | | | | 63,82 |
| 4079 | | | | 64,11 |
| 4090 | | | | 64,28 |
| 4100 | | | | 64,44 |
| 4115 | | | | 64,67 |
| 4150 | | | | 64,86 |
| 4240 | | | | 65,31 |
| 4250 | | | | 65,36 |
| 4270 | | | | 65,47 |
| 4310 | | | | 65,66 |
| 4470 | | | | 66,46 |
| 4500 | | | | 66,83 |
| 4590 | | | | 68,17 |
| 4600 | | | | 68,31 |
| 4870 | | | | 71,85 |
| 4875 | | | | 71,91 |
| 4900 | | | | 72,29 |
| 4960 | | | | 73,08 |
| 5000 | | | | 73,59 |

| New! | | | | |
|---|---|---|---|---|
| L mm | A mm | E mm | | 8% Co € 1 ud. |
| 5035 | 27 | 0,90 | 2 | 74,10 |
| 5060 | | | | 74,47 |
| 5090 | | | | 74,86 |
| 5170 | | | | 76,03 |
| 5430 | | | | 79,50 |
| 5445 | | | | 79,71 |
| 5600 | | | | 84,56 |
| 5725 | | | | 86,45 |
| 6200 | | | | 91,81 |
| 6500 | | | | 96,24 |
| 7400 | | | | 106,28 |
| 2600 | 34 | 1,10 | 1 | 49,37 |
| 2620 | | | | 49,74 |
| 2630 | | | | 49,92 |
| 2970 | | | | 56,38 |
| 3505 | | | | 66,26 |
| 3530 | | | | 66,74 |
| 3634 | | | | 68,71 |
| 3655 | | | | 69,10 |
| 3660 | | | | 69,20 |
| 3730 | | | | 70,52 |
| 3770 | | | | 71,28 |
| 3780 | | | | 71,46 |
| 3800 | | | | 71,84 |
| 3820 | | | | 72,22 |
| 3830 | | | | 72,41 |
| 3840 | | | | 72,59 |
| 3851 | | | | 72,80 |
| 3870 | | | | 73,16 |
| 3880 | | | | 73,25 |
| 3920 | | | | 73,63 |
| 4020 | | | | 74,83 |
| 4030 | | | | 75,01 |
| 4100 | | | | 76,32 |
| 4115 | | | | 76,57 |
| 4120 | | | | 76,64 |
| 4130 | | | | 76,84 |
| 4160 | | | | 77,39 |
| 4180 | | | | 77,77 |
| 4200 | | | | 78,14 |
| 4250 | | | | 79,07 |
| 4260 | | | | 79,26 |
| 4300 | | | | 80,01 |
| 4335 | | | | 80,29 |
| 4340 | | | | 80,38 |
| 4350 | | | | 80,57 |
| 4370 | | | | 80,95 |
| 4380 | | | | 81,13 |
| 4400 | | | | 81,50 |
| 4420 | | | | 81,85 |
| 4440 | | | | 82,24 |
| 4470 | | | | 82,79 |
| 4520 | | | | 83,33 |
| 4570 | | | | 84,23 |
| 4600 | | | | 84,79 |
| 4610 | | | | 84,98 |
| 4640 | | | | 85,53 |
| 4670 | | | | 86,09 |
| 4720 | | | | 86,81 |

# Ref. 4223

## HOJA DE SIERRA DE CINTA HSSE 8% Co IZARFLEX
IZARFLEX HSSE 8% Co Band Saw Blade
Lame de scie à ruban HSSE 8% Co IZARFLEX

**Cont.**

| New! L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 4750 | 34 | 1,10 | 1 | 87,23 |
| 4770 | | | | 87,59 |
| 4780 | | | | 87,79 |
| 4800 | | | | 88,15 |
| 4900 | | | | 89,69 |
| 4930 | | | | 90,24 |
| 4970 | | | | 90,99 |
| 4990 | | | | 91,36 |
| 5000 | | | | 91,54 |
| 5070 | | | | 92,79 |
| 5080 | | | | 92,98 |
| 5090 | | | | 93,15 |
| 5150 | | | | 94,08 |
| 5200 | | | | 94,87 |
| 5270 | | | | 96,15 |
| 5320 | | | | 97,07 |

| New! L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 5400 | 34 | 1,10 | 1 | 98,52 |
| 5500 | | | | 100,33 |
| 5600 | | | | 102,17 |
| 5700 | | | | 104,01 |
| 5720 | | | | 104,37 |
| 5800 | | | | 105,82 |
| 6000 | | | | 106,88 |
| 6060 | | | | 107,95 |
| 6340 | | | | 108,71 |
| 6350 | | | | 108,89 |
| 6360 | | | | 109,08 |
| 7000 | | | | 119,35 |
| 7002 | | | | 119,36 |
| 7010 | | | | 119,52 |
| 8730 | | | | 148,85 |

| New! L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 4115 | 41 | 1,30 | 1 | 109,26 |
| 4500 | | | | 119,49 |
| 4570 | | | | 121,34 |
| 4650 | | | | 122,79 |
| 4670 | | | | 123,32 |
| 4800 | | | | 126,25 |
| 4930 | | | | 129,16 |
| 5000 | | | | 130,99 |
| 5090 | | | | 133,34 |
| 5200 | | | | 136,23 |
| 5334 | | | | 139,74 |
| 5400 | | | | 141,47 |
| 5450 | | | | 142,77 |
| 5500 | | | | 144,09 |
| 5600 | | | | 146,70 |
| 5700 | | | | 148,61 |

| New! L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 5800 | 41 | 1,30 | 1 | 150,50 |
| 5920 | | | | 153,62 |
| 5940 | | | | 154,14 |
| 6192 | | | | 160,70 |
| 6300 | | | | 162,75 |
| 6500 | | | | 166,83 |
| 6600 | | | | 169,38 |
| 6675 | | | | 171,31 |
| 6775 | | | | 173,87 |
| 6800 | | | | 174,51 |
| 6990 | | | | 179,41 |
| 7250 | | | | 185,95 |
| 7400 | | | | 189,80 |
| 7470 | | | | 191,60 |
| 7880 | | | | 202,12 |

**Tipo Dentado (TZ)** / **Teeth Type (TZ)** / Type Denture (TZ)

| A x E | TPI | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | 2-3 | 3 | 3-4 | 4 | 4-6 | 5-8 | 6-10 | 8-12 | 10-14 |
| 13 × 0,65 | | | | | | | | S | S | S |
| 20 × 0,90 | | | K | | K | K | S | S | S | S |
| 27 × 0,90 | K | | K | K | K | K | S | S | S | S |
| 34 × 1,10 | | K | K | K | | K | S | S | S | |
| 41 × 1,30 | | K | | K | | K | | | | |

**Unidades pedido mínimo**
**Minimum order units**
Unités commande minimale

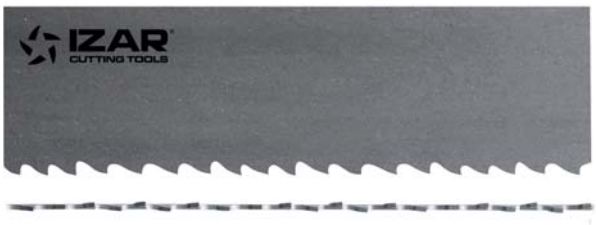
**Rollos sin Soldadura**
**Rolls without Welding**
Rouleaux non soudées

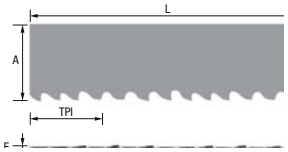
| L mm | A mm | E mm | 8% Co € |
|---|---|---|---|
| 30500 | 13 | 0,65 | 338,96 |
| 100000 | 20 | 0,90 | 1.220,26 |
| 100000 | 27 | 0,90 | 1.297,60 |
| 100000 | 34 | 1,10 | 1.533,93 |
| 75000 | 41 | 1,30 | 1.675,73 |

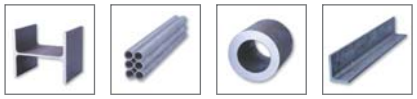
**Ejemplo Pedido** / **Order Example** / Exemple Commande — Ref. 4223 + L 2450 + A 27 + E 0,90 + TPI 6-10 + TZ S

# Ref. 4224

## HOJA DE SIERRA DE CINTA HSSE 8% Co IZARMAX
IZARMAX HSSE 8% Co Band Saw Blade
Lame de scie à ruban HSSE 8% Co IZARMAX



HSSE 8% Co

| Grupo Group-Groupe | Subgrup. |
|---|---|
| P | P.1 P.2 |

**Dentado reforzado variable 6°. Geometría de diente especial para el corte de perfiles, vigas y tubos (también corte en paquetes).**
**Similar a Ref. 4228 para grandes rendimientos.**

**Variable reinforced tooth pitch 6°. Tooth geometry specially developed to cut profiles, beams and pipes (also for bundle cuts).**
**Similar to Ref. 4228 for high performances.**

Denture renforcé variable 6°. Géométrie du dent spécialement developpée pour la coupe des profils, poutres et tubes (aussi pour paquets).
Similaire ref. 4228 pour grandes rendements.

| New! L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 2000 | 20 | 0,90 | 2 | 37,51 |
| 2060 | | | | 38,44 |
| 2070 | | | | 38,60 |
| 2080 | | | | 38,76 |
| 2090 | | | | 38,92 |
| 2095 | | | | 39,01 |
| 2100 | | | | 39,09 |
| 2110 | | | | 39,24 |
| 2140 | | | | 39,72 |
| 2240 | | | | 41,20 |
| 2265 | | | | 41,66 |
| 2360 | | | | 43,12 |
| 2362 | | | | 43,17 |
| 2370 | | | | 43,29 |
| 2375 | | | | 43,35 |
| 2400 | | | | 43,75 |
| 2450 | | | | 44,50 |
| 2465 | | | | 44,76 |
| 2470 | | | | 44,86 |
| 2530 | | | | 45,77 |
| 3000 | | | | 54,51 |
| 2080 | 27 | 0,90 | 2 | 43,78 |
| 2150 | | | | 43,89 |
| 2450 | | | | 44,59 |
| 2455 | | | | 44,63 |
| 2460 | | | | 44,66 |
| 2480 | | | | 45,79 |
| 2520 | | | | 45,95 |

| New! L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 2530 | 27 | 0,90 | 2 | 45,99 |
| 2550 | | | | 46,06 |
| 2570 | | | | 46,34 |
| 2575 | | | | 46,41 |
| 2600 | | | | 46,83 |
| 2680 | | | | 47,65 |
| 2700 | | | | 48,41 |
| 2750 | | | | 48,74 |
| 2755 | | | | 48,84 |
| 2760 | | | | 48,90 |
| 2765 | | | | 48,96 |
| 2825 | | | | 49,88 |
| 2835 | | | | 49,96 |
| 2845 | | | | 49,98 |
| 2910 | | | | 50,21 |
| 2920 | | | | 50,40 |
| 2925 | | | | 50,47 |
| 2927 | | | | 50,50 |
| 2945 | | | | 50,78 |
| 2950 | | | | 50,85 |
| 2965 | | | | 51,11 |
| 2995 | | | | 51,68 |
| 3010 | | | | 51,92 |
| 3080 | | | | 54,88 |
| 3090 | | | | 55,05 |
| 3100 | | | | 55,22 |
| 3120 | | | | 55,27 |
| 3150 | | | | 55,34 |
| 3160 | | | | 55,37 |
| 3180 | | | | 55,43 |

| New! L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 3300 | 27 | 0,90 | 2 | 56,71 |
| 3320 | | | | 57,05 |
| 3345 | | | | 57,48 |
| 3350 | | | | 57,57 |
| 3370 | | | | 57,92 |
| 3420 | | | | 59,19 |
| 3440 | | | | 59,51 |
| 3495 | | | | 60,34 |
| 3505 | | | | 60,49 |
| 3660 | | | | 61,02 |
| 3800 | | | | 62,01 |
| 3810 | | | | 62,18 |
| 3820 | | | | 62,34 |
| 3830 | | | | 62,50 |
| 3853 | | | | 62,89 |
| 3857 | | | | 62,95 |
| 3900 | | | | 64,20 |
| 3925 | | | | 64,61 |
| 4014 | | | | 65,48 |
| 4090 | | | | 66,29 |
| 4500 | | | | 75,94 |
| 5000 | | | | 84,38 |
| 3505 | 34 | 1,10 | 1 | 79,41 |
| 3660 | | | | 82,93 |
| 3925 | | | | 87,67 |
| 4100 | | | | 91,59 |
| 4120 | | | | 92,02 |
| 4250 | | | | 94,48 |
| 4335 | | | | 96,40 |
| 4400 | | | | 97,84 |

| New! L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 4520 | 34 | 1,10 | 1 | 100,18 |
| 4570 | | | | 101,20 |
| 4600 | | | | 101,88 |
| 4640 | | | | 102,63 |
| 4780 | | | | 105,50 |
| 4970 | | | | 109,38 |
| 4990 | | | | 109,78 |
| 5000 | | | | 110,02 |
| 5040 | | | | 110,89 |
| 5104 | | | | 112,16 |
| 5200 | | | | 114,08 |
| 5300 | | | | 116,12 |
| 5334 | | | | 116,86 |
| 5500 | | | | 120,54 |
| 5870 | | | | 125,61 |
| 6350 | | | | 132,17 |
| 4115 | 41 | 1,30 | 1 | 128,29 |
| 4640 | | | | 143,53 |
| 5040 | | | | 155,12 |
| 5265 | | | | 161,65 |
| 5450 | | | | 167,04 |
| 5800 | | | | 177,19 |
| 5920 | | | | 180,67 |
| 6175 | | | | 188,45 |
| 6300 | | | | 192,26 |
| 6360 | | | | 194,09 |
| 6585 | | | | 199,98 |
| 6775 | | | | 205,49 |
| 6900 | | | | 209,11 |
| 6990 | | | | 211,84 |
| 7250 | | | | 219,72 |
| 7470 | | | | 225,65 |

**Rollos sin Soldadura**
**Rolls without Welding**
Rouleaux non soudées

| L mm | A mm | E mm | 8% Co € |
|---|---|---|---|
| 100000 | 20 | 0,90 | 1.456,48 |
| 100000 | 27 | 0,90 | 1.513,73 |
| 100000 | 34 | 1,10 | 1.858,78 |
| 75000 | 41 | 1,30 | 1.979,05 |

**Tipo Dentado (TZ) / Teeth Type (TZ) /** Type denture (TZ)

| A x E | TPI | | | | |
|---|---|---|---|---|---|
| | 2-3 | 3-4 | 5-7 | 8-11 | 12-16 |
| 20 × 0,90 | | | P | P | P |
| 27 × 0,90 | | P | P | P | P |
| 34 × 1,10 | P | P | P | P | |
| 41 × 1,30 | P | P | P | P | |

**Unidades pedido mínimo**
**Minimum order units**
Unités commande minimale

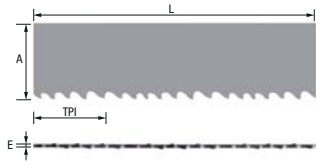
**Ejemplo Pedido / Order Example /** Exemple commande Ref. 4224 + L 2080 + A 27 + E 0,90 + TPI 8-11 + TZ P

# Ref. 4228

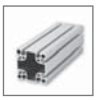
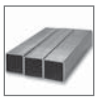
## HOJA DE SIERRA DE CINTA HSSE 8% Co + 4% Cr IZARPLUS

IZARPLUS HSSE 8% Co + 4% Cr Band Saw Blade

Lame de scie à ruban HSSE 8% Co + 4% Cr IZARPLUS




HSSE 8% Co | 4% Cr

| Grupo Group-Groupe | Subgrup. |
|---|---|
| P | P.1 P.2 |

| Grupo Group-Groupe |
|---|
| M |

| Grupo Group-Groupe |
|---|
| K |

| Grupo Group-Groupe |
|---|
| N |

**Especial Perfiles. Dentado variable 0° adecuado para perfiles y tareas de corte en serie, susceptibles de vibraciones.**

**Special Profiles. Variable tooth pitch 0° for profiles and bundle sawing tasks, susceptible of vibrations.**

Spécial profils. Denture variable 0° convenable pour profils et travaux de coupe en paquet, susceptibles des vibrations.

New!

| L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 1100 | 13 | 0,65 | 3 | 24,60 |
| 1130 | | | | 25,27 |
| 1138 | | | | 25,45 |
| 1140 | | | | 25,48 |
| 1300 | | | | 28,03 |
| 1310 | | | | 28,24 |
| 1325 | | | | 28,41 |
| 1330 | | | | 28,54 |
| 1335 | | | | 28,62 |
| 1340 | | | | 28,74 |
| 1350 | | | | 28,93 |
| 1368 | | | | 29,31 |
| 1400 | | | | 29,67 |
| 1425 | | | | 30,00 |
| 1430 | | | | 30,05 |
| 1435 | | | | 30,18 |
| 1440 | | | | 30,27 |
| 1450 | | | | 31,09 |
| 1460 | | | | 31,30 |
| 1470 | | | | 31,51 |
| 1500 | | | | 31,87 |
| 1550 | | | | 32,50 |
| 1575 | | | | 33,01 |
| 1580 | | | | 33,12 |
| 1605 | | | | 33,26 |
| 1620 | | | | 33,32 |
| 1635 | | | | 33,38 |
| 1638 | | | | 33,43 |
| 1640 | | | | 33,46 |
| 1645 | | | | 33,58 |
| 1650 | | | | 33,68 |
| 1680 | | | | 34,29 |
| 1730 | | | | 34,89 |
| 1732 | | | | 34,93 |
| 1735 | | | | 34,98 |
| 1740 | | | | 35,04 |
| 1750 | | | | 35,22 |
| 1974 | | | | 39,73 |
| 2180 | | | | 43,84 |
| 2240 | | | | 45,04 |
| 2265 | | | | 45,56 |
| 2900 | | | | 58,31 |
| 3700 | | | | 68,89 |
| 3800 | | | | 70,74 |
| 3825 | | | | 71,20 |
| 4180 | | | | 75,21 |

New!

| L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 1125 | 13 | 0,90 | 3 | 25,15 |
| 1140 | | | | 25,48 |
| 1325 | | | | 28,41 |
| 1330 | | | | 28,54 |
| 1335 | | | | 28,62 |
| 1338 | | | | 28,69 |
| 1375 | | | | 29,46 |
| 1470 | | | | 31,51 |
| 1485 | | | | 31,83 |
| 1638 | | | | 33,43 |
| 1640 | | | | 33,46 |
| 1650 | | | | 33,68 |
| 1735 | | | | 34,98 |
| 1750 | | | | 35,22 |
| 1840 | | | | 37,05 |
| 2240 | | | | 45,04 |

New!

| L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 1735 | 20 | 0,90 | 2 | 34,98 |
| 2000 | | | | 37,51 |
| 2010 | | | | 37,70 |
| 2035 | | | | 37,98 |
| 2045 | | | | 38,16 |
| 2060 | | | | 38,45 |
| 2070 | | | | 38,60 |
| 2080 | | | | 38,76 |
| 2082 | | | | 38,78 |
| 2085 | | | | 38,84 |
| 2090 | | | | 38,92 |
| 2100 | | | | 39,09 |
| 2110 | | | | 39,24 |
| 2130 | | | | 39,52 |
| 2140 | | | | 39,72 |
| 2150 | | | | 39,89 |
| 2265 | | | | 41,66 |
| 2360 | | | | 43,13 |
| 2362 | | | | 43,18 |
| 2370 | | | | 43,29 |
| 2375 | | | | 43,35 |
| 2400 | | | | 43,74 |
| 2465 | | | | 44,76 |
| 2480 | | | | 45,04 |
| 2500 | | | | 45,31 |
| 2520 | | | | 45,60 |
| 2530 | | | | 45,77 |
| 2600 | | | | 47,05 |
| 2825 | | | | 49,88 |
| 2960 | | | | 52,27 |
| 2970 | | | | 52,45 |
| 2980 | | | | 52,62 |
| 3000 | | | | 52,97 |

New!

| L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 2080 | 27 | 0,90 | 2 | 43,78 |
| 2100 | | | | 43,81 |
| 2110 | | | | 43,82 |
| 2145 | | | | 43,88 |
| 2150 | | | | 43,88 |
| 2190 | | | | 44,69 |
| 2360 | | | | 44,38 |
| 2375 | | | | 44,39 |
| 2400 | | | | 44,42 |
| 2430 | | | | 44,47 |
| 2435 | | | | 44,47 |
| 2440 | | | | 44,48 |
| 2445 | | | | 44,50 |
| 2450 | | | | 44,59 |
| 2455 | | | | 44,62 |
| 2460 | | | | 44,64 |
| 2470 | | | | 45,23 |
| 2480 | | | | 45,79 |
| 2490 | | | | 45,85 |
| 2500 | | | | 45,88 |
| 2520 | | | | 45,93 |
| 2535 | | | | 46,00 |
| 2550 | | | | 46,06 |
| 2560 | | | | 46,19 |
| 2565 | | | | 46,24 |
| 2570 | | | | 46,34 |
| 2600 | | | | 46,83 |
| 2640 | | | | 47,10 |
| 2655 | | | | 47,19 |
| 2660 | | | | 47,29 |
| 2680 | | | | 47,65 |
| 2700 | | | | 48,41 |
| 2710 | | | | 48,60 |
| 2715 | | | | 48,60 |
| 2720 | | | | 48,60 |
| 2730 | | | | 48,64 |
| 2740 | | | | 48,66 |
| 2745 | | | | 48,70 |
| 2750 | | | | 48,74 |
| 2755 | | | | 48,84 |
| 2760 | | | | 48,90 |
| 2765 | | | | 48,96 |
| 2780 | | | | 49,21 |
| 2800 | | | | 49,47 |
| 2805 | | | | 49,55 |
| 2820 | | | | 49,81 |
| 2825 | | | | 49,88 |

# Ref. 4228

**HOJA DE SIERRA DE CINTA HSSE 8% Co + 4% Cr IZARPLUS**
IZARPLUS HSSE 8% Co + 4% Cr Band Saw Blade
Lame de scie à ruban HSSE 8% Co + 4% Cr IZARPLUS

**Cont.**

| New! | L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|---|
| | 2830 | 27 | 0,90 | 2 | 49,93 |
| | 2835 | | | | 49,96 |
| | 2840 | | | | 49,97 |
| | 2845 | | | | 49,98 |
| | 2850 | | | | 50,05 |
| | 2860 | | | | 50,05 |
| | 2865 | | | | 50,06 |
| | 2870 | | | | 50,06 |
| | 2885 | | | | 50,07 |
| | 2900 | | | | 50,07 |
| | 2910 | | | | 50,24 |
| | 2920 | | | | 50,36 |
| | 2925 | | | | 50,47 |
| | 2927 | | | | 50,50 |
| | 2930 | | | | 50,55 |
| | 2950 | | | | 50,85 |
| | 2965 | | | | 51,13 |
| | 3000 | | | | 51,76 |
| | 3010 | | | | 51,92 |
| | 3025 | | | | 52,19 |
| | 3035 | | | | 52,37 |
| | 3080 | | | | 54,87 |
| | 3090 | | | | 55,05 |
| | 3100 | | | | 55,22 |
| | 3110 | | | | 55,25 |
| | 3120 | | | | 55,28 |
| | 3135 | | | | 55,32 |
| | 3140 | | | | 55,33 |
| | 3150 | | | | 55,35 |
| | 3160 | | | | 55,38 |
| | 3180 | | | | 55,43 |
| | 3200 | | | | 55,78 |
| | 3270 | | | | 56,20 |
| | 3300 | | | | 56,71 |
| | 3320 | | | | 57,05 |
| | 3335 | | | | 57,32 |
| | 3340 | | | | 57,39 |
| | 3345 | | | | 57,49 |
| | 3350 | | | | 57,57 |

| New! | L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|---|
| | 3352 | 27 | 0,90 | 2 | 57,61 |
| | 3370 | | | | 57,92 |
| | 3400 | | | | 59,08 |
| | 3420 | | | | 59,19 |
| | 3440 | | | | 59,53 |
| | 3454 | | | | 59,79 |
| | 3485 | | | | 59,81 |
| | 3505 | | | | 59,82 |
| | 3560 | | | | 60,26 |
| | 3630 | | | | 60,54 |
| | 3650 | | | | 60,85 |
| | 3660 | | | | 61,02 |
| | 3670 | | | | 61,19 |
| | 3684 | | | | 61,43 |
| | 3800 | | | | 62,01 |
| | 3810 | | | | 62,18 |
| | 3820 | | | | 62,34 |
| | 3830 | | | | 62,48 |
| | 3835 | | | | 62,57 |
| | 3850 | | | | 62,82 |
| | 3851 | | | | 62,83 |
| | 3857 | | | | 62,94 |
| | 3900 | | | | 63,64 |
| | 3930 | | | | 64,13 |
| | 4090 | | | | 66,29 |
| | 4115 | | | | 66,70 |
| | 4160 | | | | 67,42 |
| | 4230 | | | | 68,55 |
| | 4250 | | | | 68,87 |
| | 4280 | | | | 69,37 |
| | 4500 | | | | 72,93 |
| | 4600 | | | | 74,56 |
| | 4820 | | | | 83,33 |
| | 4870 | | | | 84,18 |
| | 4880 | | | | 84,36 |
| | 5030 | | | | 86,95 |
| | 5200 | | | | 89,90 |

| New! | L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|---|
| | 3320 | 34 | 1,10 | 1 | 75,22 |
| | 3505 | | | | 79,41 |
| | 3660 | | | | 81,76 |
| | 3730 | | | | 83,34 |
| | 3770 | | | | 84,23 |
| | 3800 | | | | 84,90 |
| | 3820 | | | | 85,34 |
| | 3860 | | | | 86,23 |
| | 3910 | | | | 87,30 |
| | 3920 | | | | 87,53 |
| | 3950 | | | | 88,21 |
| | 4020 | | | | 89,76 |
| | 4030 | | | | 89,99 |
| | 4100 | | | | 91,56 |
| | 4120 | | | | 92,02 |
| | 4160 | | | | 92,92 |
| | 4250 | | | | 94,49 |
| | 4335 | | | | 96,40 |
| | 4380 | | | | 97,42 |
| | 4400 | | | | 97,86 |
| | 4420 | | | | 98,30 |
| | 4450 | | | | 98,74 |
| | 4470 | | | | 99,18 |
| | 4500 | | | | 99,78 |
| | 4520 | | | | 100,18 |
| | 4570 | | | | 101,20 |
| | 4610 | | | | 101,96 |
| | 4620 | | | | 102,20 |
| | 4640 | | | | 102,63 |
| | 4780 | | | | 105,50 |
| | 4800 | | | | 105,95 |
| | 4930 | | | | 108,49 |
| | 4970 | | | | 109,38 |
| | 4990 | | | | 109,78 |
| | 5030 | | | | 110,52 |
| | 5040 | | | | 110,74 |

| New! | L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|---|
| | 5050 | 34 | 1,10 | 1 | 110,95 |
| | 5080 | | | | 111,50 |
| | 5090 | | | | 111,67 |
| | 5200 | | | | 114,08 |
| | 5270 | | | | 115,51 |
| | 5300 | | | | 116,12 |
| | 6350 | | | | 131,03 |
| | 6500 | | | | 133,92 |
| | 6550 | | | | 134,95 |
| | 7000 | | | | 143,71 |
| | 7550 | | | | 154,39 |
| | 8730 | | | | 178,52 |
| | 4115 | 41 | 1,30 | 1 | 128,29 |
| | 4500 | | | | 139,19 |
| | 4640 | | | | 143,53 |
| | 4930 | | | | 151,75 |
| | 5000 | | | | 153,90 |
| | 5040 | | | | 155,14 |
| | 5090 | | | | 156,66 |
| | 5265 | | | | 161,65 |
| | 5300 | | | | 162,74 |
| | 5340 | | | | 163,98 |
| | 5350 | | | | 164,29 |
| | 5450 | | | | 167,04 |
| | 5700 | | | | 173,95 |
| | 5920 | | | | 180,67 |
| | 6175 | | | | 188,45 |
| | 6300 | | | | 191,73 |
| | 6400 | | | | 194,77 |
| | 6585 | | | | 199,98 |
| | 6775 | | | | 205,49 |
| | 6800 | | | | 206,24 |
| | 6900 | | | | 209,12 |
| | 7470 | | | | 225,65 |
| | 7880 | | | | 238,04 |
| | 8200 | | | | 247,70 |

**Tipo Dentado (TZ)** / **Teeth Type (TZ)** / Type Denture (TZ)

| A x E | TPI | | | | | |
|---|---|---|---|---|---|---|
| | 3-4 | 4-6 | 5-8 | 6-10 | 8-12 | 10-14 |
| 13 × 0,65 | | | | S | S | S |
| 13 × 0,90 | | | | S | S | S |
| 20 × 0,90 | | S | S | S | S | S |
| 27 × 0,90 | S | S | S | S | S | S |
| 34 × 1,10 | S | S | S | S | S | |
| 41 × 1,30 | S | S | S | S | | |

**Rollos sin Soldadura** / **Rolls without Welding** / Rouleaux non soudées

| L mm | A mm | E mm | 8% Co € |
|---|---|---|---|
| 30500 | 13 | 0,65 | 426,03 |
| 123000 | | | 1.716,73 |
| 30500 | 13 | 0,90 | 426,03 |
| 100000 | 20 | 0,90 | 1.456,48 |

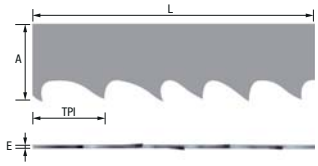
| L mm | A mm | E mm | 8% Co € |
|---|---|---|---|
| 100000 | 27 | 0,90 | 1.513,73 |
| 134000 | | | 2.083,71 |
| 100000 | 34 | 1,10 | 1.858,78 |
| 75000 | 41 | 1,30 | 1.978,97 |

**Unidades pedido mínimo**
**Minimum order units**
Unités commande minimale

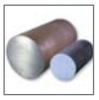
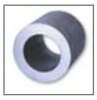
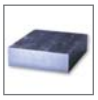
**Ejemplo Pedido** / **Order Example** / Exemple Commande Ref. 4228 + L 2080 + A 27 + E 0,90 + TPI 8-12 + TZ S

# Ref. 4229

## HOJA DE SIERRA DE CINTA HSSE 8% Co + 4% Cr IZARPLUS
IZARPLUS HSSE 8% Co + 4% Cr Band Saw Blade
Lame de scie à ruban HSSE 8% Co + 4% Cr IZARPLUS




HSSE 8% Co | 4% Cr

| Grupo Group-Groupe | Subgrup. |
|---|---|
| P | P.1 P.2 |

| Grupo Group-Groupe |
|---|
| M |

| Grupo Group-Groupe |
|---|
| N |

**Especial Macizos. Dentado variable 10°. Mayores rendimientos de corte, ideal para el corte de piezas macizas grandes.**

**Special Solid Pieces. Variable tooth pitch 10°. Higher cutting performance, suitable to cut big solid pieces.**

Spécial pièces pleins. Denture variable 10°. Rendements de coupe supèrieures, convenable pour la coupe de grandes pièces pleins.

New!

| L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 2080 | 27 | 0,90 | 2 | 43,78 |
| 2150 | | | | 43,89 |
| 2450 | | | | 44,59 |
| 2455 | | | | 44,61 |
| 2459 | | | | 44,63 |
| 2460 | | | | 44,64 |
| 2480 | | | | 45,79 |
| 2550 | | | | 46,06 |
| 2565 | | | | 46,27 |
| 2570 | | | | 46,34 |
| 2590 | | | | 46,66 |
| 2600 | | | | 46,83 |
| 2680 | | | | 47,65 |
| 2700 | | | | 48,41 |
| 2710 | | | | 48,60 |
| 2720 | | | | 48,65 |
| 2730 | | | | 48,69 |
| 2740 | | | | 48,72 |
| 2750 | | | | 48,74 |
| 2755 | | | | 48,84 |
| 2760 | | | | 48,90 |
| 2765 | | | | 48,96 |
| 2800 | | | | 49,45 |
| 2825 | | | | 49,88 |
| 2835 | | | | 49,93 |
| 2845 | | | | 49,98 |
| 2855 | | | | 50,15 |
| 2910 | | | | 50,24 |
| 2925 | | | | 50,47 |
| 2950 | | | | 50,85 |
| 3000 | | | | 51,76 |
| 3010 | | | | 51,92 |
| 3025 | | | | 52,19 |
| 3035 | | | | 52,37 |
| 3100 | | | | 55,22 |
| 3105 | | | | 55,24 |

New!

| L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 3120 | 27 | 0,90 | 2 | 55,29 |
| 3140 | | | | 55,34 |
| 3150 | | | | 55,35 |
| 3160 | | | | 55,37 |
| 3180 | | | | 55,43 |
| 3200 | | | | 55,82 |
| 3222 | | | | 56,18 |
| 3240 | | | | 56,49 |
| 3270 | | | | 56,60 |
| 3300 | | | | 56,71 |
| 3320 | | | | 57,05 |
| 3345 | | | | 57,49 |
| 3350 | | | | 57,57 |
| 3352 | | | | 57,61 |
| 3400 | | | | 58,83 |
| 3420 | | | | 59,19 |
| 3445 | | | | 59,63 |
| 3495 | | | | 60,32 |
| 3500 | | | | 60,40 |
| 3505 | | | | 60,49 |
| 3520 | | | | 60,54 |
| 3550 | | | | 60,66 |
| 3640 | | | | 60,96 |
| 3660 | | | | 61,02 |
| 3770 | | | | 61,53 |
| 3800 | | | | 62,01 |
| 3810 | | | | 62,17 |
| 3820 | | | | 62,34 |
| 3830 | | | | 62,49 |
| 3900 | | | | 63,64 |
| 3930 | | | | 64,13 |
| 4090 | | | | 66,29 |
| 4110 | | | | 66,62 |
| 4115 | | | | 66,70 |
| 4310 | | | | 72,98 |
| 4500 | | | | 75,94 |
| 4800 | | | | 81,00 |

New!

| L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 3350 | 34 | 1,10 | 1 | 72,63 |
| 3505 | | | | 79,41 |
| 3770 | | | | 84,22 |
| 3820 | | | | 85,34 |
| 3850 | | | | 86,01 |
| 4020 | | | | 89,81 |
| 4100 | | | | 91,59 |
| 4115 | | | | 91,90 |
| 4120 | | | | 92,01 |
| 4130 | | | | 92,24 |
| 4160 | | | | 92,91 |
| 4210 | | | | 94,02 |
| 4220 | | | | 94,25 |
| 4250 | | | | 94,90 |
| 4335 | | | | 96,40 |
| 4420 | | | | 97,95 |
| 4440 | | | | 98,41 |
| 4450 | | | | 98,62 |
| 4470 | | | | 99,07 |
| 4500 | | | | 99,73 |
| 4520 | | | | 100,19 |
| 4530 | | | | 100,39 |
| 4570 | | | | 101,20 |
| 4640 | | | | 102,76 |
| 4720 | | | | 104,16 |
| 4770 | | | | 105,26 |
| 4780 | | | | 105,50 |
| 4860 | | | | 107,27 |
| 4865 | | | | 107,36 |
| 4970 | | | | 109,38 |
| 4990 | | | | 109,78 |
| 5000 | | | | 110,02 |
| 5090 | | | | 111,99 |
| 5156 | | | | 113,12 |
| 5200 | | | | 114,08 |
| 5270 | | | | 115,47 |
| 5300 | | | | 116,12 |

New!

| L mm | A mm | E mm | | 8% Co € 1 ud. |
|---|---|---|---|---|
| 4115 | 41 | 1,30 | 1 | 128,29 |
| 4500 | | | | 139,19 |
| 4640 | | | | 143,53 |
| 4650 | | | | 143,82 |
| 4700 | | | | 145,37 |
| 4900 | | | | 150,83 |
| 4930 | | | | 151,75 |
| 5000 | | | | 153,88 |
| 5040 | | | | 155,12 |
| 5080 | | | | 156,35 |
| 5090 | | | | 156,66 |
| 5340 | | | | 163,98 |
| 5350 | | | | 164,29 |
| 5450 | | | | 167,34 |
| 5800 | | | | 177,19 |
| 5890 | | | | 179,77 |
| 5920 | | | | 180,67 |
| 6040 | | | | 184,34 |
| 6300 | | | | 191,32 |
| 6500 | | | | 197,40 |
| 6585 | | | | 199,98 |
| 6675 | | | | 202,71 |
| 6775 | | | | 205,49 |
| 6800 | | | | 206,24 |
| 6900 | | | | 209,11 |
| 7470 | | | | 225,65 |
| 8200 | | | | 235,08 |
| 8400 | | | | 240,71 |
| 5800 | 54 | 1,60 | 1 | 218,99 |
| 6040 | | | | 231,98 |
| 6096 | | | | 234,13 |
| 6200 | | | | 240,61 |
| 6270 | | | | 243,18 |
| 6500 | | | | 251,61 |
| 7140 | | | | 275,13 |
| 7200 | | | | 277,33 |
| 7310 | | | | 281,56 |
| 7450 | | | | 286,45 |
| 7460 | | | | 286,83 |
| 7545 | | | | 289,89 |
| 7600 | | | | 292,01 |
| 8900 | | | | 349,87 |
| 9750 | | | | 383,28 |

**Tipo Dentado (TZ)**
**Teeth Type (TZ)** / Type Denture (TZ)

| A x E | TPI | | | | |
|---|---|---|---|---|---|
| | 1,4-2 | 2-3 | 3-4 | 4-6 | 5-8 |
| 27 × 0,90 | | K | K | K | K |
| 34 × 1,10 | K | K | K | K | K |
| 41 × 1,30 | K | K | K | K | K |
| 54 × 1,60 | K | K | K | K | |

**Unidades pedido mínimo**
**Minimum order units**
Unités commande minimale

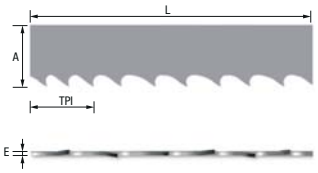
**Rollos sin Soldadura**
**Rolls without Welding** - Rouleaux non soudées

| L mm | A mm | E mm | 8% Co € |
|---|---|---|---|
| 100000 | 20 | 0,90 | 1.456,48 |
| 100000 | 27 | 0,90 | 1.513,73 |
| 134000 | | | 2.083,71 |
| 100000 | 34 | 1,10 | 1.858,78 |
| 75000 | 41 | 1,30 | 1.979,05 |

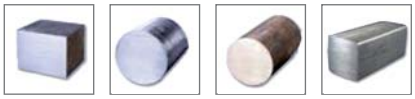
**Ejemplo Pedido / Order Example** / Exemple Commande Ref. 4229 + L 2080 + A 27 + E 0,90 + TPI 5-8 + TZ K

# Ref. 4231

## HOJA DE SIERRA DE CINTA ALTO RENDIMIENTO PLUS
Plus High Performance Band Saw Blade
Lame de scie à ruban haut rendement plus




HSSE 10% Co



| Grupo Group-Groupe | Subgrup. |
|---|---|
| P | P.1 P.2 |
| M | |
| S | |
| N | N.1 N.2 |

**Uso universal en perfiles y macizos. Corte en capas y paquetes. Aleaciones a base de níquel, aceros dúplex, resistentes al calor, titanio y sus aleaciones, bronce al aluminio, materiales duros, aceros inoxidables austeníticos resistentes al ácido.**

**Universal use in profiles & solid materials. Layer and bundle cutting. Nickel-based alloys, duplex and heat-resistant steels, titanium & alloys, aluminium bronze, hard materials, acid-resistant austenitic stainless steels.**

Utilisation universelle en profils et matériaux massifs. Coupes en nappe et en paquet. Alliages à base de nickel, aciers duplex et résistants à la chaleur, titane et alliages, bronze d'aluminium, matériaux durs, aciers inox austénitiques résistants aux acides.

| L mm | A mm | E mm | 10% Co € 1 ud. |
|---|---|---|---|
| 2080 | 27 | 0,90 | 43,85 |
| 2150 | | | 45,09 |
| 2450 | | | 50,60 |
| 2480 | | | 51,13 |
| 2550 | | | 52,42 |
| 2600 | | | 53,31 |
| 2700 | | | 55,15 |
| 2750 | | | 56,05 |
| 2825 | | | 57,43 |
| 2845 | | | 57,82 |
| 2910 | | | 58,98 |
| 2925 | | | 59,25 |
| 2950 | | | 59,70 |
| 3010 | | | 60,79 |
| 3100 | | | 62,43 |
| 3120 | | | 62,82 |
| 3150 | | | 63,43 |
| 3200 | | | 64,43 |
| 3300 | | | 66,01 |
| 3320 | | | 66,41 |
| 3350 | | | 67,01 |
| 3370 | | | 67,42 |
| 3420 | | | 68,27 |
| 3505 | | | 69,82 |
| 3660 | | | 72,67 |
| 3800 | | | 75,20 |
| 3830 | | | 75,80 |
| 3900 | | | 77,18 |
| 4090 | | | 80,53 |
| 4500 | | | 87,99 |
| 4900 | | | 95,29 |
| 5090 | | | 98,77 |
| 7400 | | | 140,90 |

| L mm | A mm | E mm | 10% Co € 1 ud. |
|---|---|---|---|
| 3505 | 34 | 1,10 | 85,90 |
| 3770 | | | 90,30 |
| 3851 | | | 92,25 |
| 4100 | | | 99,25 |
| 4160 | | | 100,61 |
| 4250 | | | 102,63 |
| 4335 | | | 104,52 |
| 4430 | | | 106,81 |
| 4520 | | | 108,65 |
| 4600 | | | 110,49 |
| 4640 | | | 111,45 |
| 4780 | | | 114,49 |
| 4800 | | | 114,97 |
| 4970 | | | 118,76 |
| 5040 | | | 120,33 |
| 5090 | | | 121,53 |
| 5200 | | | 123,91 |
| 5300 | | | 126,14 |
| 5500 | | | 130,62 |
| 6350 | | | 149,69 |
| 7000 | | | 168,64 |
| 8730 | | | 208,06 |

| L mm | A mm | E mm | 10% Co € 1 ud. |
|---|---|---|---|
| 4115 | 41 | 1,30 | 139,28 |
| 4570 | | | 153,75 |
| 4640 | | | 155,99 |
| 5040 | | | 168,70 |
| 5265 | | | 175,86 |
| 5450 | | | 181,74 |
| 5730 | | | 190,54 |
| 5800 | | | 192,86 |
| 5920 | | | 196,69 |
| 6000 | | | 199,23 |
| 6175 | | | 204,82 |
| 6585 | | | 217,81 |
| 6775 | | | 223,88 |
| 6900 | | | 227,87 |
| 6990 | | | 230,71 |
| 7470 | | | 245,99 |
| 7880 | | | 259,00 |
| 8200 | | | 269,20 |
| 9880 | | | 324,36 |

| L mm | A mm | E mm | 10% Co € 1 ud. |
|---|---|---|---|
| 5800 | 54 | 1,60 | 257,72 |
| 6040 | | | 267,83 |
| 6200 | | | 274,58 |
| 6500 | | | 287,27 |
| 6800 | | | 299,84 |
| 7200 | | | 316,78 |
| 7600 | | | 333,65 |
| 8900 | | | 388,45 |
| 10000 | | | 434,88 |

**Tipo Dentado (TZ)** / **Teeth Type (TZ)** / Type denture (TZ)

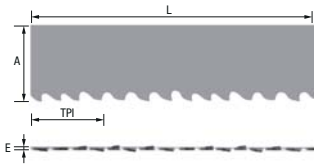
| A x E | TPI | | | | |
|---|---|---|---|---|---|
| | 1,4-2 | 2-3 | 3-4 | 4-6 | 5-8 |
| 27 × 0,90 | | | K | K | K |
| 34 × 1,10 | | K | K | K | |
| 41 × 1,30 | | K | K | K | |
| 54 × 1,60 | K | K | K | K | |

**Unidades pedido mínimo**
**Minimum order units**
Unités commande minimale

**Ejemplo Pedido** / **Order Example** / Exemple commande Ref. 4231 + L 2450 + A 27 + E 0,90 + TPI 5-8 + TZ K

# Ref. 4232

## HOJA DE SIERRA DE CINTA METAL DURO
HM Band Saw Blade
Lame de scie à ruban carbure




MD/HM Carbure

| Grupo Group-Groupe | Grupo Group-Groupe | Subgrup. |
|---|---|---|
| K | N | N.1 - N.2 N.3 - N.4 - N.5 |

**Uso general en aceros y metales no ferrosos. Aluminio y otros materiales que tienden a acumularse en el filo de corte. Secciones transversales hasta 600 mm. Materiales dureza hasta 60 HRC.**

**General use in steel & non-ferrous metal. Aluminium and other materials with Built-Up edge risk. Cross cut up to 600 mm. Material hardness up to 60 HRC.**

Pour usiner des aciers et métaux non ferreux. Aluminium et autres aciers qui s´accumulent sur les filets de coupe. Sections transversales jusqu`à 600 mm. Aciers dureté jusqu`à 60 HRC.

| L mm | A mm | E mm | 📦 | TPI 1,4-2 € 1 ud. | TPI 2-3 € 1 ud. | TPI 3-4 € 1 ud. |
|---|---|---|---|---|---|---|
| 1140 | 13 | 0,80 | 3 | | | 117,27 |
| 1325 | | | | | | 135,21 |
| 1640 | | | | | | 165,81 |
| 1750 | | | | | | 176,48 |
| 2240 | | | | | | 225,88 |
| 2000 | 20 | 0,80 | 2 | | | 184,10 |
| 2060 | | | | | | 189,46 |
| 2110 | | | | | | 193,88 |
| 2140 | | | | | | 196,54 |
| 2265 | | | | | | 207,65 |
| 2360 | | | | | | 216,06 |
| 2370 | | | | | | 216,95 |
| 2400 | | | | | | 219,60 |
| 2465 | | | | | | 225,42 |
| 2550 | | | | | | 232,91 |
| 2080 | 27 | 0,90 | 2 | | 159,36 | 199,45 |
| 2150 | | | | | 164,52 | 205,99 |
| 2450 | | | | | 186,64 | 233,85 |
| 2550 | | | | | 194,00 | 243,15 |
| 2600 | | | | | 197,67 | 247,81 |
| 2700 | | | | | 205,06 | 257,12 |
| 2765 | | | | | 209,85 | 263,13 |
| 2845 | | | | | 215,73 | 270,57 |
| 2910 | | | | | 220,53 | 276,64 |
| 2950 | | | | | 223,47 | 280,37 |
| 3010 | | | | | 227,92 | 285,93 |

| L mm | A mm | E mm | 📦 | TPI 1,4-2 € 1 ud. | TPI 2-3 € 1 ud. | TPI 3-4 € 1 ud. |
|---|---|---|---|---|---|---|
| 3100 | 27 | 0,90 | 2 | | 234,54 | 294,28 |
| 3160 | | | | | 238,94 | 299,82 |
| 3180 | | | | | 240,42 | 301,71 |
| 3350 | | | | | 252,96 | 317,53 |
| 3420 | | | | | 258,15 | 324,06 |
| 3505 | | | | | 264,39 | 331,94 |
| 3660 | | | | | 275,81 | 346,34 |
| 3800 | | | | | 286,12 | 359,36 |
| 4090 | | | | | 307,47 | 386,33 |
| 3505 | 34 | 1,10 | 1 | 245,77 | 284,84 | 359,27 |
| 4100 | | | | 286,23 | 331,94 | 419,02 |
| 4335 | | | | 302,21 | 350,57 | 442,61 |
| 4520 | | | | 314,79 | 365,21 | 461,18 |
| 4640 | | | | 322,95 | 374,72 | 473,21 |
| 4780 | | | | 332,47 | 385,79 | 487,28 |
| 4970 | | | | 345,40 | 400,81 | 506,37 |
| 5200 | | | | 361,04 | 419,02 | 529,47 |
| 5500 | | | | 381,43 | 442,80 | 559,58 |
| 8730 | | | | 661,35 | 767,58 | 970,01 |
| 4115 | 41 | 1,30 | 1 | 322,48 | 384,50 | 461,42 |
| 4640 | | | | 362,54 | 432,49 | 519,19 |
| 5040 | | | | 393,08 | 469,05 | 563,22 |
| 5450 | | | | 424,36 | 506,53 | 608,39 |
| 5920 | | | | 460,25 | 549,46 | 660,12 |
| 6585 | | | | 511,02 | 610,24 | 733,32 |
| 6900 | | | | 535,02 | 639,03 | 768,00 |
| 7470 | | | | 578,58 | 691,15 | 830,75 |

**Tipo Dentado (TZ)** / **Teeth Type (TZ)** / Type denture (TZ)

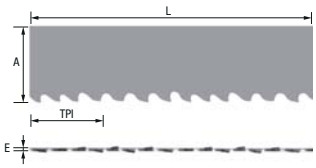
| A x E | TPI | | |
|---|---|---|---|
| | 1,4-2 | 2-3 | 3-4 |
| 13×0,80 | | | T |
| 20×0,80 | | | T |
| 27×0,90 | | T | T |
| 34×1,10 | T | T | T |
| 41×1,30 | T | T | T |

📦 **Unidades pedido mínimo**
**Minimum order units**
Unités commande minimale

**Ejemplo Pedido** / **Order Example** / Exemple commande Ref. 4232 + L 2450 + A 27 + E 0,90 + TPI 3-4 + TZ T

# Ref. 4235

## HOJA DE SIERRA DE CINTA METAL DURO
HM Band Saw Blade
Lame de scie à ruban carbure




MD/HM Carbure

| Grupo Group-Groupe | Subgrup. |
|---|---|
| P | P.1 P.2 |
| Grupo Group-Groupe | |
| K | |
| Grupo Group-Groupe | |
| S | |
| Grupo Group-Groupe | Subgrup. |
| N | N.1 N.2 |

**Suavidad extrema para una alta Vc. Apta para Zirconio, Molibdeno y aceros endurecidos hasta 62 HRC.**

**Extremely soft for a high Vc. Use in Zirconium, Molybdenum and hardened steels up to 62 HRC.**

Polissage maximale avec une haute VC idéale pour Zirconium, Molibdène et aciers jusqu´à 62 HRC.

| L mm | A mm | E mm | | TPI 1,4-2 € 1 ud. | TPI 2-3 € 1 ud. | TPI 3-4 € 1 ud. |
|---|---|---|---|---|---|---|
| 2080 | 27 | 0,90 | 2 | | | 239,59 |
| 2150 | | | | | | 247,45 |
| 2450 | | | | | | 281,12 |
| 2460 | | | | | | 282,26 |
| 2550 | | | | | | 292,30 |
| 2590 | | | | | | 296,77 |
| 2600 | | | | | | 297,92 |
| 2700 | | | | | | 309,14 |
| 2765 | | | | | | 316,47 |
| 2845 | | | | | | 325,42 |
| 2910 | | | | | | 332,74 |
| 2950 | | | | | | 337,21 |
| 3010 | | | | | | 343,96 |
| 3100 | | | | | | 354,05 |
| 3180 | | | | | | 363,03 |
| 3200 | | | | | | 365,32 |
| 3350 | | | | | | 382,12 |
| 3420 | | | | | | 389,98 |
| 3505 | | | | | | 399,48 |
| 3660 | | | | | | 416,90 |
| 3800 | | | | | | 432,60 |
| 4090 | | | | | | 465,17 |

| L mm | A mm | E mm | | TPI 1,4-2 € 1 ud. | TPI 2-3 € 1 ud. | TPI 3-4 € 1 ud. |
|---|---|---|---|---|---|---|
| 3505 | 34 | 1,10 | 1 | | 343,86 | 441,58 |
| 4100 | | | | | 400,98 | 515,32 |
| 4335 | | | | | 423,49 | 544,41 |
| 4520 | | | | | 441,28 | 567,31 |
| 4640 | | | | | 452,78 | 582,19 |
| 4780 | | | | | 466,23 | 599,56 |
| 4970 | | | | | 484,49 | 623,08 |
| 5090 | | | | | 495,84 | |
| 5200 | | | | | 506,55 | 651,56 |
| 5500 | | | | | 535,34 | 688,72 |
| 7000 | | | | | | 894,01 |
| 4115 | 41 | 1,30 | 1 | 412,28 | 456,19 | 581,01 |
| 4640 | | | | 463,81 | 513,30 | 654,06 |
| 5040 | | | | 503,06 | 556,82 | 709,70 |
| 5450 | | | | 543,31 | 601,45 | 766,77 |
| 5920 | | | | 589,43 | 652,57 | 832,16 |
| 6585 | | | | 654,70 | 724,94 | 924,71 |
| 6900 | | | | 685,61 | 759,22 | 968,50 |
| 7470 | | | | 741,55 | 821,24 | 1.047,81 |

**Tipo Dentado (TZ)** / **Teeth Type (TZ)** / Type denture (TZ)

| A x E | TPI | | |
|---|---|---|---|
| | 1,4-2 | 2-3 | 3-4 |
| 27×0,90 | | | T |
| 34×1,10 | | T | T |
| 41×1,30 | T | T | T |

**Unidades pedido mínimo**
**Minimum order units**
Unités commande minimale

**Ejemplo Pedido** / **Order Example** / Exemple commande Ref. 4235 + L 2450 + A 27 + E 0,90 + TPI 3-4 + TZ T

# HOJAS DE SIERRA DE CINTA
Band Saw Blades
Lames de scie à ruban

**IZAR CUTTING TOOLS S.A.L.**
Parque Empresarial Boroa 2B2
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**izartool.com**

**Cliente**
Customer
Client _____

**Dirección**
Address
Adresse _____

**Contacto**
Contact
Contact _____

**E-mail**
E-mail
E-mail _____

**Fecha**
Date
Date _____

**Ciudad**
Town
Ville _____

**Teléfono**
Phone
Téléphone _____

**Fax**
Fax
Fax _____

**CONSULTA SIERRAS CINTA ESPECIALES /** INQUIRY FOR SPECIAL BAND SAW BLADES / ENQUÊTE POUR LAMES DE SCIE À RUBAN SPÉCIALES

**Nº / DENOMINACIÓN MATERIAL**
MATERIAL N° / DENOMINATION
N° / DÉNOMINATION MATÉRIEL _____

**Dureza (N/mm²)**
Strength (N/mm²)
Dureté (N/mm²) _____

**FORMA PIEZA**
PIECE SHAPE
FORME PIÈCE

☐ **Redonda** Round Rond
☐ **Cuadrada** Square Carré
☐ **Tubo** Pipe Tube
☐ **Perfil** Profile Profil
☐ **Otra** Another one Autre _____

**SECCIÓN TRANSVERSAL (TUBOS)**
CROSS-SECTION (PIPES)
SECTION TRANSVERSALE (TUBES)

**Diámetro (mm)**
Diameter (mm)
Diamètre (mm) _____

**Espesor Pared (mm)**
Wall Thickness (mm)
Epaisseur paroi (mm) _____

**ESTADO SUPERFICIE**
SURFACE CONDITIONS
CONDITIONS SURFACE

☐ **Forjado** Forged Forgée
☐ **Laminado** Rolled Laminée
☐ **Fundido** Cast Fonte
☐ **Estirado** Drawn Etirée
☐ **Otro** Another one Autre _____

**TIPO CORTE**
CUTTING TYPE
TYPE COUPE

☐ **Unitario** Individual Unitaire
☐ **Nº Capas** Nº Layers Nº couches _____
☐ **Nº Paquetes** Nº Bundles Nº paquets _____

**SUJECIÓN (MAT. PLANOS / CUADRADOS, PERFILES)**
CLAMPING (FLAT / SQUARE MATERIALS, PROFILES)
ATTACHEMENT (MAT. PLANS / CARRÉS, PROFILS)

☐ **Firme** Flat Plat
☐ **Solo en los Extremos** On Edge Seulement les filets

**DIMENSIONES HOJA DE SIERRA**
BAND SAW BLADE DIMENSIONS
DIMENSIONS LAME DE SCIE À RUBAN

**Longitud (mm)** Length (mm) Longueur (mm) _____
**Ancho (mm)** Width (mm) Largeur (mm) _____
**Espesor (mm)** Thickness (mm) Epaisseur (mm) _____

**MODELO MÁQUINA**
MACHINE TYPE
MODÈLE MACHINE _____

**PEDIDO SIERRAS DE CINTA STÁNDARD /** STANDARD BAND SAW BLADE ORDER / COMMANDE POUR LAMES DE SCIE À RUBAN STANDARD

| **Cantidad** Quantity Quantité | **Descripción Producto** Product Description Description produite | **Longitud x Ancho x Espesor (mm)** Length x Width x Thickness (mm) Longueur x largeur x epaisseur (mm) | **Dientes / Pulgada (TPI)** Tooth Pitch (TPI) Dents / Pouce (TPI) | **Forma Diente** Tooth Shape Forme dent | **Triscado** Set Type Avoyage |
|---|---|---|---|---|---|
| 2 | **Ref. 4223 IZARFLEX** | **2450 × 27 × 0,90** | **6-10** | **S** | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

EJEMPLO / Example / Exemple

# SIERRAS CIRCULARES
# Slitting Saws
# Fraises scies

| Material | | | | Vc (m/min.) | Avance Feed Pas (fz/rev.) |
|---|---|---|---|---|---|
| P | | P.1 | <850 N/mm² | 20-40 | 0,020 - 0,030 |
| | | P.2 | < 1000 N/mm² | 10-30 | 0,015 |
| | | P.3 | 1000-1300 N/mm² | 8-15 | 0,010 |
| | | P.5 | MARTENSÍTICO Martensitic Martensitique | 8-15 | 0,010 |
| M | INOX AUSTENÍTICO Austenitic Stainless Steel Aciers Inox austénitique | | | 8-15 | 0,010 |
| K | FUNDICIÓN Cast Iron Fonte | K.1 | < 700 N/mm² | 30-40 | 0,030 |
| | | K.2 | 700-1000 N/mm² | | |

| Material | | | | Vc (m/min.) | Avance Feed Pas (fz/rev.) |
|---|---|---|---|---|---|
| N | Cu - BRONCE - LATÓN Copper - Bronze - Brass Cuivre - Bronze - Laiton | N.1 | VIRUTA CORTA Short Chip Copeaux courts | 150-200 | 0,035 |
| | | N.2 | VIRUTA LARGA Long Chip Copeaux longs | | |
| | ALUMINIO - MAGNESIO Aluminium - Magnesium | N.3 | NO ALEADO Unalloyed Sans alliage | 600-750 | 0,050 |
| | | N.4 | < 10% Si | | |
| | | N.5 | > 10% Si | | |
| | | N.6 | TERMOPLÁSTICOS Thermoplastics Thermoplastiques | 100-130 | 0,050 |
| | | N.7 | DUROPLÁSTICOS Hard Plastics Plastiques durs | | |
| Tubos Acero y Perfiles Steel Pipes & Profiles Tubes aciers et profils | | | | 50 | 0,025 |

$$r.p.m. = \frac{Vc/Cs \times 1.000}{\pi \times \varnothing}$$

*** Los valores indicados son orientativos, disminuir estos valores al aumentar la profundidad de corte.**

*** These figures are orientative, reduce figures as cutting depth grows.**

* Les données indiquées sont une orientation, on conseille les réduire au moment d´augmenter la profondeur de coupe.

# Ref. 4200

## FRESA SIERRA CIRCULAR DENTADO A
A Small Pitch Slitting Saw
Fraise scie denture A

HSS | DIN 1837 N | ISO 2296 | Forma A Form | Tol. ø (j15) d (H7) | Tol. L (j11)

**Dentado A de paso pequeño, para mecanizados finos y trabajos de orfebrería.**

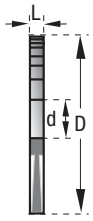
**Small pitch A toothing, mainly used for fine machining & craftmanship in precious metals.**

Denture A â pas fin, principalement utilisée pour les travaux d'usinage de précision et d'orfèvrerie.

| D mm | L mm | d mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|
| 20 | 0,20 | 5 | 80 | 64436 | 13,57 |
| | 0,25 | 5 | 64 | 64439 | 13,57 |
| | 0,30 | 5 | 64 | 64442 | 12,20 |
| | 0,40 | 5 | 64 | 64445 | 12,20 |
| | 0,50 | 5 | 48 | 64448 | 11,74 |
| | 0,60 | 5 | 48 | 64451 | 11,74 |
| | 0,80 | 5 | 48 | 64454 | 11,74 |
| | 1,00 | 5 | 40 | 64457 | 11,74 |
| | 1,20 | 5 | 40 | 64460 | 13,57 |
| | 1,60 | 5 | 40 | 64463 | 14,89 |
| | 2,00 | 5 | 32 | 64466 | 15,59 |
| 25 | 0,20 | 8 | 80 | 64484 | 13,93 |
| | 0,25 | 8 | 80 | 64487 | 13,93 |
| | 0,30 | 8 | 80 | 64490 | 13,00 |
| | 0,40 | 8 | 64 | 64493 | 13,00 |
| | 0,50 | 8 | 64 | 64496 | 12,37 |
| | 0,60 | 8 | 64 | 64499 | 12,37 |
| | 0,80 | 8 | 48 | 64502 | 12,37 |
| | 1,00 | 8 | 48 | 64505 | 12,37 |
| | 1,20 | 8 | 48 | 64508 | 14,24 |
| | 1,60 | 8 | 40 | 64511 | 15,24 |
| | 2,00 | 8 | 40 | 64514 | 16,20 |
| | 2,50 | 8 | 40 | 64517 | 17,57 |
| 32 | 0,20 | 8 | 100 | 64532 | 14,89 |
| | 0,25 | 8 | 100 | 64535 | 14,89 |
| | 0,30 | 8 | 80 | 64538 | 13,57 |
| | 0,40 | 8 | 80 | 64541 | 13,57 |
| | 0,50 | 8 | 80 | 64544 | 13,00 |
| | 0,60 | 8 | 64 | 64547 | 13,00 |
| | 0,80 | 8 | 64 | 64550 | 13,00 |
| | 1,00 | 8 | 64 | 64553 | 13,00 |
| | 1,20 | 8 | 48 | 64556 | 15,24 |
| | 1,60 | 8 | 48 | 64559 | 15,24 |
| | 2,00 | 8 | 48 | 64562 | 17,22 |
| | 2,50 | 8 | 40 | 64565 | 18,53 |
| | 3,00 | 8 | 40 | 64568 | 19,88 |
| 40 | 0,20 | 10 | 128 | 64580 | 16,20 |
| | 0,25 | 10 | 100 | 64583 | 16,20 |
| | 0,30 | 10 | 100 | 64586 | 15,59 |
| | 0,40 | 10 | 100 | 64589 | 15,59 |
| | 0,50 | 10 | 80 | 64592 | 14,57 |
| | 0,60 | 10 | 80 | 64595 | 14,57 |
| | 0,80 | 10 | 80 | 64598 | 14,57 |
| | 1,00 | 10 | 64 | 64601 | 14,57 |
| | 1,20 | 10 | 64 | 64604 | 15,59 |
| | 1,60 | 10 | 64 | 64610 | 16,55 |
| | 2,00 | 10 | 48 | 64613 | 17,90 |
| | 2,50 | 10 | 48 | 64616 | 19,88 |
| | 3,00 | 10 | 48 | 64619 | 23,45 |
| | 4,00 | 10 | 40 | 64622 | 27,17 |
| 50 | 0,25 | 13 | 128 | 64634 | 19,18 |
| | 0,30 | 13 | 128 | 64637 | 17,57 |
| | 0,40 | 13 | 100 | 64640 | 17,57 |
| | 0,50 | 13 | 100 | 64643 | 16,55 |
| | 0,60 | 13 | 100 | 64646 | 16,55 |
| | 0,80 | 13 | 80 | 64649 | 16,55 |
| | 1,00 | 13 | 80 | 64652 | 16,55 |
| | 1,20 | 13 | 80 | 64655 | 17,57 |
| | 1,60 | 13 | 64 | 64661 | 19,18 |
| | 2,00 | 13 | 64 | 64664 | 20,55 |
| | 2,50 | 13 | 64 | 64667 | 22,19 |
| | 3,00 | 13 | 48 | 64670 | 25,16 |
| | 4,00 | 13 | 48 | 64676 | 29,15 |
| | 5,00 | 13 | 48 | 64679 | 38,42 |
| 63 | 0,30 | 16 | 128 | 64688 | 19,88 |
| | 0,40 | 16 | 128 | 64691 | 19,88 |
| | 0,50 | 16 | 128 | 64694 | 19,18 |
| | 0,60 | 16 | 100 | 64697 | 19,18 |
| | 0,80 | 16 | 100 | 64700 | 19,18 |
| | 1,00 | 16 | 100 | 64703 | 19,18 |
| | 1,20 | 16 | 80 | 64706 | 19,88 |
| | 1,60 | 16 | 80 | 64712 | 22,19 |
| | 2,00 | 16 | 80 | 64715 | 23,84 |
| | 2,50 | 16 | 64 | 64718 | 25,16 |
| | 3,00 | 16 | 64 | 64721 | 27,85 |
| | 4,00 | 16 | 64 | 64724 | 35,11 |
| | 5,00 | 16 | 48 | 64727 | 44,39 |
| | 6,00 | 16 | 48 | 64730 | 49,67 |
| 80 | 0,50 | 22 | 128 | 64742 | 22,85 |
| | 0,60 | 22 | 128 | 64745 | 22,85 |
| | 0,80 | 22 | 128 | 64748 | 22,85 |
| | 1,00 | 22 | 100 | 64751 | 22,85 |
| | 1,20 | 22 | 100 | 64754 | 23,53 |
| | 1,60 | 22 | 100 | 64757 | 24,81 |
| | 2,00 | 22 | 80 | 64760 | 27,52 |
| | 2,50 | 22 | 80 | 64763 | 32,80 |
| | 3,00 | 22 | 80 | 64766 | 35,78 |
| | 4,00 | 22 | 64 | 64769 | 43,71 |
| | 5,00 | 22 | 64 | 64772 | 53,66 |
| | 6,00 | 22 | 64 | 64775 | 60,27 |
| 100 | 0,60 | 22 | 160 | 64784 | 26,46 |
| | 0,80 | 22 | 128 | 64787 | 26,46 |
| | 1,00 | 22 | 128 | 64790 | 27,52 |
| | 1,20 | 22 | 128 | 64793 | 27,52 |
| | 1,60 | 22 | 100 | 64799 | 33,11 |
| | 2,00 | 22 | 100 | 64802 | 36,43 |
| | 2,50 | 22 | 100 | 64805 | 41,07 |
| | 3,00 | 22 | 80 | 64808 | 44,39 |
| | 4,00 | 22 | 80 | 64811 | 60,27 |
| | 5,00 | 22 | 80 | 64814 | 67,54 |
| | 6,00 | 22 | 64 | 64817 | 78,80 |
| 125 | 0,80 | 22 | 160 | 64826 | 40,41 |
| | 1,00 | 22 | 160 | 64829 | 40,41 |
| | 1,20 | 22 | 128 | 64832 | 40,41 |
| | 1,60 | 22 | 128 | 64838 | 42,38 |
| | 2,00 | 22 | 128 | 64841 | 44,39 |
| | 2,50 | 22 | 100 | 64844 | 47,03 |
| | 3,00 | 22 | 100 | 64850 | 52,33 |
| | 4,00 | 22 | 100 | 64856 | 78,15 |
| | 5,00 | 22 | 80 | 64862 | 91,31 |
| | 6,00 | 22 | 80 | 64868 | 102,00 |
| 160 | 1,20 | 32 | 160 | 64886 | 56,95 |
| | 1,60 | 32 | 160 | 64892 | 58,30 |
| | 2,00 | 32 | 128 | 64895 | 60,27 |
| | 2,50 | 32 | 128 | 64898 | 67,54 |
| | 3,00 | 32 | 128 | 64901 | 76,85 |
| | 4,00 | 32 | 100 | 64904 | 107,96 |
| | 5,00 | 32 | 100 | 64907 | 127,85 |
| | 6,00 | 32 | 100 | 64910 | 145,71 |
| 200 | 1,60 | 32 | 160 | 64922 | 81,12 |
| | 2,00 | 32 | 160 | 64925 | 86,25 |
| | 2,50 | 32 | 160 | 64928 | 97,73 |
| | 3,00 | 32 | 128 | 64931 | 109,21 |
| | 4,00 | 32 | 128 | 64934 | 154,56 |
| | 5,00 | 32 | 128 | 64937 | 183,95 |
| | 6,00 | 32 | 100 | 64940 | 212,03 |
| 250 | 2,00 | 32 | 200 | 64946 | 119,42 |
| | 2,50 | 32 | 160 | 64949 | 136,66 |
| | 3,00 | 32 | 160 | 64952 | 150,71 |
| | 4,00 | 32 | 160 | 64955 | 218,43 |
| | 5,00 | 32 | 128 | 64958 | 259,29 |
| | 6,00 | 32 | 128 | 64964 | 305,28 |
| 315 | 2,50 | 40 | 200 | 64970 | 213,31 |
| | 3,00 | 40 | 200 | 64973 | 240,15 |
| | 4,00 | 40 | 160 | 64976 | 309,11 |
| | 5,00 | 40 | 160 | 64979 | 376,78 |
| | 6,00 | 40 | 160 | 64982 | 447,04 |

# Ref. 4210

## FRESA SIERRA CIRCULAR DENTADO B
B Small Pitch Slitting Saw
Fraise scie denture B




HSS | DIN 1838 N | ISO 2296 | Forma B Form | Tol. ø (j15) d (H7) | Tol. L (j11)

**Dentado B de paso medio y grande, para mecanizados con un importante arranque de viruta.**

**Medium & big pitch B toothing, mainly used for machining operations of high chip volume.**

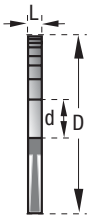
Denture B â pas moyen et gros, principalement utilisée pour les travaux d'usinage impliquant un volume important de limaille.

| D mm | L mm | d mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|
| 50 | 0,50 | 13 | 48 | 65066 | 16,55 |
| | 0,60 | 13 | 48 | 65069 | 16,55 |
| | 0,80 | 13 | 40 | 65072 | 16,55 |
| | 1,00 | 13 | 40 | 65075 | 16,55 |
| | 1,20 | 13 | 40 | 65078 | 17,57 |
| | 1,60 | 13 | 32 | 65084 | 19,18 |
| | 2,00 | 13 | 32 | 65087 | 20,55 |
| | 2,50 | 13 | 32 | 65090 | 22,19 |
| | 3,00 | 13 | 24 | 65093 | 25,16 |
| | 4,00 | 13 | 24 | 65096 | 29,15 |
| | 5,00 | 13 | 24 | 65099 | 38,42 |
| | 6,00 | 13 | 20 | 65102 | 43,71 |
| 63 | 0,50 | 16 | 64 | 65111 | 19,18 |
| | 0,60 | 16 | 48 | 65114 | 19,18 |
| | 0,80 | 16 | 48 | 65117 | 19,18 |
| | 1,00 | 16 | 48 | 65120 | 19,18 |
| | 1,20 | 16 | 40 | 65123 | 19,88 |
| | 1,60 | 16 | 40 | 65132 | 22,19 |
| | 2,00 | 16 | 40 | 65135 | 23,84 |
| | 2,50 | 16 | 32 | 65138 | 25,16 |
| | 3,00 | 16 | 32 | 65141 | 27,85 |
| | 4,00 | 16 | 32 | 65144 | 35,08 |
| | 5,00 | 16 | 24 | 65147 | 44,39 |
| | 6,00 | 16 | 24 | 65150 | 49,67 |
| 80 | 0,60 | 22 | 64 | 65156 | 22,85 |
| | 0,80 | 22 | 64 | 65159 | 22,85 |
| | 1,00 | 22 | 48 | 65162 | 22,85 |
| | 1,20 | 22 | 48 | 65165 | 23,53 |
| | 1,60 | 22 | 48 | 65171 | 24,81 |
| | 2,00 | 22 | 40 | 65174 | 27,52 |
| | 2,50 | 22 | 40 | 65177 | 32,80 |
| | 3,00 | 22 | 40 | 65180 | 35,78 |
| | 4,00 | 22 | 32 | 65183 | 43,71 |
| | 5,00 | 22 | 32 | 65186 | 53,66 |
| | 6,00 | 22 | 32 | 65189 | 60,27 |
| 100 | 0,80 | 22 | 64 | 65198 | 26,46 |
| | 1,00 | 22 | 64 | 65201 | 26,46 |
| | 1,20 | 22 | 64 | 65204 | 27,52 |
| | 1,60 | 22 | 48 | 65207 | 33,11 |
| | 2,00 | 22 | 48 | 65210 | 36,43 |

| D mm | L mm | d mm | Z | N° Art. HSS | € |
|---|---|---|---|---|---|
| | 2,50 | 22 | 48 | 65213 | 41,07 |
| | 3,00 | 22 | 40 | 65216 | 44,39 |
| | 4,00 | 22 | 40 | 65222 | 60,27 |
| | 5,00 | 22 | 40 | 65225 | 67,54 |
| | 6,00 | 22 | 32 | 65228 | 78,80 |
| 125 | 0,80 | 22 | 80 | 65234 | 40,41 |
| | 1,00 | 22 | 80 | 65237 | 40,41 |
| | 1,20 | 22 | 64 | 65240 | 40,41 |
| | 1,60 | 22 | 64 | 65246 | 42,38 |
| | 2,00 | 22 | 64 | 65249 | 44,39 |
| | 2,50 | 22 | 48 | 65252 | 47,03 |
| | 3,00 | 22 | 48 | 65255 | 52,33 |
| | 4,00 | 22 | 48 | 65258 | 78,15 |
| | 5,00 | 22 | 40 | 65261 | 91,41 |
| | 6,00 | 22 | 40 | 65264 | 102,00 |
| 160 | 1,20 | 32 | 80 | 65270 | 56,95 |
| | 1,60 | 32 | 80 | 65276 | 58,87 |
| | 2,00 | 32 | 64 | 65279 | 60,27 |
| | 2,50 | 32 | 64 | 65282 | 67,54 |
| | 3,00 | 32 | 64 | 65285 | 76,85 |
| | 4,00 | 32 | 48 | 65288 | 107,96 |
| | 5,00 | 32 | 48 | 65291 | 127,85 |
| | 6,00 | 32 | 48 | 65294 | 145,71 |
| 200 | 1,60 | 32 | 80 | 65303 | 81,12 |
| | 2,00 | 32 | 80 | 65306 | 86,25 |
| | 2,50 | 32 | 80 | 65309 | 97,73 |
| | 3,00 | 32 | 64 | 65312 | 109,21 |
| | 4,00 | 32 | 64 | 65318 | 154,56 |
| | 5,00 | 32 | 64 | 65321 | 183,95 |
| | 6,00 | 32 | 48 | 65324 | 212,03 |
| 250 | 2,00 | 32 | 100 | 65330 | 119,42 |
| | 2,50 | 32 | 80 | 65333 | 136,66 |
| | 3,00 | 32 | 80 | 65339 | 150,71 |
| | 4,00 | 32 | 80 | 65342 | 221,58 |
| | 5,00 | 32 | 64 | 65345 | 259,29 |
| | 6,00 | 32 | 64 | 65348 | 305,28 |
| 315 | 2,50 | 40 | 100 | 65351 | 213,31 |
| | 3,00 | 40 | 100 | 65354 | 240,15 |
| | 4,00 | 40 | 80 | 65357 | 309,11 |
| | 5,00 | 40 | 80 | 65360 | 376,78 |
| | 6,00 | 40 | 80 | 65363 | 447,04 |

# Ref. 4240

## FRESA SIERRA CIRCULAR TRONZADO
Cutting Off Slitting Saw
Fraise scie Tronçonnage




HSS

Tol.
ø (j15) d (H7)
L (j11)

**Dentado Bw de paso medio, usado en trabajos de corte para secciones medianas y pequeñas. Los dientes están chaflanados alternativamente.**

**Medium pitch Bw toothing, used for cutting medium & small sections. The teeth are chamfered alternately.**

Denture **Bw** â pas moyen, utilisée pour découper des sections de petite et moyenne dimensions. Les dents sont chanfreinées en alternance.

**Dentado C de paso grande, con dientes alternativamente altos y bajos, usado para cortar secciones grandes. Los dientes altos tienen chaflanes rompevirutas.**

**Big pitch C toothing, with teeth alternately high & low, used for cutting big sections. The high teeth are provided with chamfers for chip breaking.**

Denture **C** â pas gros, avec dents supérieures et inférieures alternées, utilisée pour découper de grandes sections. Les dents supérieures sont pourvues de chanfreins brise-copeaux.

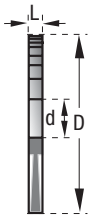
| D mm | L mm | d mm | Z | Taladros Arrastre Pinholes Trous d'épingle | Dentado Teeth Denture | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| **200** | 2,00 | 32 | 160 | **F (2/8,5/45 - 2/11/63)** | **Bw** | 65450 | **83,64** |
| **225** | 2,00 | 32 | 180 | **F (2/8,5/45 - 2/11/63)** | **Bw** | 65456 | **94,68** |
| **250** | 2,00 | 32 | 200 | **F (2/8,5/45 - 2/11/63)** | **Bw** | 65462 | **111,56** |
| **250** | 2,50 | 32 | 160 | **F (2/8,5/45 - 2/11/63)** | **C** | 65468 | **111,56** |
| **275** | 2,00 | 32 | 180 | **F (2/8,5/45 - 2/11/63)** | **C** | 65471 | **146,52** |
| **275** | 2,50 | 32 | 180 | **F (2/8,5/45 - 2/11/63)** | **C** | 65474 | **146,52** |
| **300** | 2,00 | 32 | 190 | **F (2/8,5/45 - 2/11/63)** | **C** | 65477 | **207,44** |
| **300** | 2,50 | 40 | 190 | **H (2/8,8/55 - 4/12/64)** | **C** | 65483 | **207,44** |
| **315** | 2,50 | 40 | 200 | **H (2/8,8/55 - 4/12/64)** | **C** | 65495 | **199,17** |
| **315** | 3,00 | 40 | 200 | **H (2/8,8/55 - 4/12/64)** | **C** | 65501 | **224,76** |
| **350** | 2,50 | 40 | 220 | **H (2/8,8/55 - 4/12/64)** | **Bw** | 65504 | **239,09** |
| **350** | 3,00 | 40 | 160 | **H (2/8,8/55 - 4/12/64)** | **C** | 65507 | **239,09** |
| **370** | 3,00 | 50 | 160 | **S (4/15/80 - 4/14/85)** | **C** | 65510 | **378,67** |
| **400** | 3,00 | 50 | 200 | **S (4/15/80 - 4/14/85)** | **C** | 65513 | **420,33** |
| **400** | 3,50 | 50 | 200 | **S (4/15/80 - 4/14/85)** | **C** | 65516 | **420,33** |
| **425** | 3,50 | 50 | 180 | **S (4/15/80 - 4/14/85)** | **C** | 75571 | **508,28** |

# Ref. 4250

## FRESA SIERRA CIRCULAR TRONZADO ANTIGRIP
AntiGrip Cutting Off Slitting Saw
Fraise scie Tronçonnage AntiGrip

HSS

Tol.
ø (j15) d (H7)
L (j11)




| D mm | L mm | d mm | Z | Taladros Arrastre Pinholes Trous d'épingle | Dentado Teeth Denture | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|
| **200** | 2,00 | 32 | 160 | **F (2/8,5/45 - 2/11/63)** | **Bw** | 65588 | **91,32** |
| **225** | 2,00 | 32 | 180 | **F (2/8,5/45 - 2/11/63)** | **Bw** | 65591 | **103,65** |
| **250** | 2,00 | 32 | 200 | **F (2/8,5/45 - 2/11/63)** | **Bw** | 65597 | **120,54** |
| **250** | 2,50 | 32 | 160 | **F (2/8,5/45 - 2/11/63)** | **C** | 65603 | **135,07** |
| **275** | 2,00 | 32 | 180 | **F (2/8,5/45 - 2/11/63)** | **C** | 65606 | **158,24** |
| **275** | 2,50 | 32 | 180 | **F (2/8,5/45 - 2/11/63)** | **C** | 65609 | **164,14** |
| **300** | 2,00 | 32 | 190 | **F (2/8,5/45 - 2/11/63)** | **C** | 65612 | **221,53** |
| **300** | 2,50 | 40 | 190 | **H (2/8,8/55 - 4/12/64)** | **C** | 65618 | **221,53** |
| **315** | 2,50 | 40 | 200 | **H (2/8,8/55 - 4/12/64)** | **C** | 65627 | **214,57** |
| **315** | 3,00 | 40 | 200 | **H (2/8,8/55 - 4/12/64)** | **C** | 65630 | **240,34** |
| **350** | 2,50 | 40 | 220 | **H (2/8,8/55 - 4/12/64)** | **Bw** | 65633 | **260,58** |
| **350** | 3,00 | 40 | 160 | **H (2/8,8/55 - 4/12/64)** | **C** | 65636 | **293,91** |
| **370** | 3,00 | 50 | 160 | **S (4/15/80 - 4/14/85)** | **C** | 65639 | **403,99** |
| **400** | 3,00 | 50 | 200 | **S (4/15/80 - 4/14/85)** | **C** | 65642 | **453,94** |
| **400** | 3,50 | 50 | 200 | **S (4/15/80 - 4/14/85)** | **C** | 65645 | **495,29** |
| **425** | 3,50 | 50 | 180 | **S (4/15/80 - 4/14/85)** | **C** | 75572 | **542,74** |

**Dentado Bw de paso medio, usado en trabajos de corte para secciones medianas y pequeñas. Los dientes están chaflanados alternativamente.**

**Medium pitch Bw toothing, used for cutting medium & small sections. The teeth are chamfered alternately.**

Denture **Bw** â pas moyen, utilisée pour découper des sections de petite et moyenne dimensions. Les dents sont chanfreinées en alternance.

**Dentado C de paso grande, con dientes alternativamente altos y bajos, usado para cortar secciones grandes. Los dientes altos tienen chaflanes rompevirutas.**

**Big pitch C toothing, with teeth alternately high & low, used for cutting big sections. The high teeth are provided with chamfers for chip breaking.**

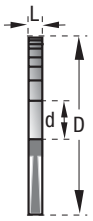
Denture **C** â pas gros, avec dents supérieures et inférieures alternées, utilisée pour découper de grandes sections. Les dents supérieures sont pourvues de chanfreins brise-copeaux.

# Ref. 4252

## FRESA SIERRA CIRCULAR TRONZADO ANTIGRIP
AntiGrip Cutting Off Slitting Saw
Fraise scie Tronçonnage AntiGrip

HSS

Tol.
ø (j15) d (H7)
L (j11)



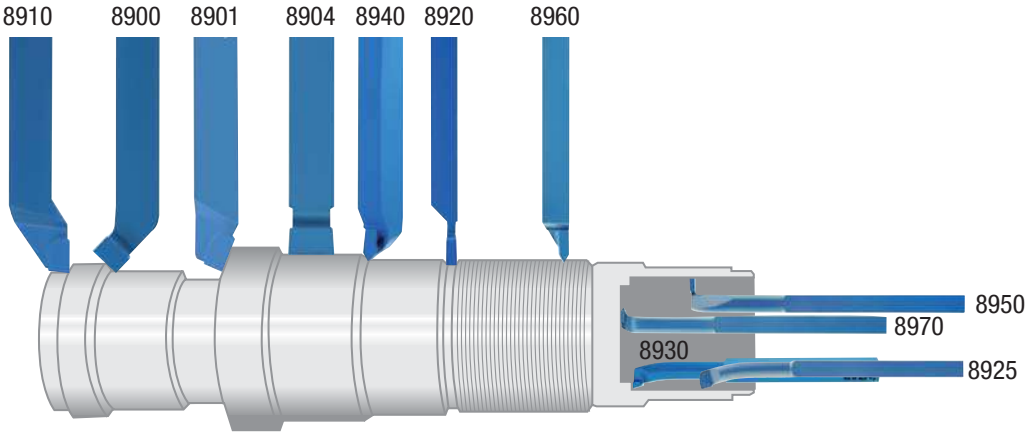

| D mm | L mm | d mm | Z | Taladros Arrastre Pinholes<br>Trous d'épingle | Dentado Teeth<br>Denture | Nº Art. HSS | € |
|---|---|---|---|---|---|---|---|
| **200** | 2,00 | 32 | 100 | **F (2/8,5/45 - 2/11/63)** | **C** | 65651 | **91,32** |
| **225** | 2,00 | 32 | 120 | **F (2/8,5/45 - 2/11/63)** | **C** | 65654 | **103,65** |
| **250** | 2,00 | 32 | 100 | **F (2/8,5/45 - 2/11/63)** | **C** | 65657 | **120,54** |
| **250** | 2,50 | 32 | 100 | **F (2/8,5/45 - 2/11/63)** | **C** | 65660 | **135,07** |
| **275** | 2,00 | 32 | 110 | **F (2/8,5/45 - 2/11/63)** | **C** | 75581 | **158,24** |
| **275** | 2,50 | 32 | 110 | **F (2/8,5/45 - 2/11/63)** | **C** | 75582 | **164,14** |
| **300** | 2,00 | 32 | 120 | **F (2/8,5/45 - 2/11/63)** | **C** | 65663 | **221,53** |
| **300** | 2,50 | 40 | 120 | **H (2/8,8/55 - 4/12/64)** | **C** | 75583 | **221,53** |
| **315** | 2,50 | 40 | 100 | **H (2/8,8/55 - 4/12/64)** | **C** | 65666 | **214,57** |
| **315** | 3,00 | 40 | 100 | **H (2/8,8/55 - 4/12/64)** | **C** | 75584 | **240,34** |
| **350** | 2,50 | 40 | 120 | **H (2/8,8/55 - 4/12/64)** | **C** | 75585 | **260,58** |
| **350** | 3,00 | 40 | 100 | **H (2/8,8/55 - 4/12/64)** | **C** | 75586 | **293,91** |
| **370** | 3,00 | 50 | 100 | **S (4/15/80 - 4/14/85)** | **C** | 75587 | **403,99** |
| **400** | 3,00 | 50 | 128 | **S (4/15/80 - 4/14/85)** | **C** | 75588 | **453,94** |
| **400** | 3,50 | 50 | 128 | **S (4/15/80 - 4/14/85)** | **C** | 65669 | **495,29** |
| **425** | 3,50 | 50 | 96 | **S (4/15/80 - 4/14/85)** | **C** | 75589 | **542,74** |

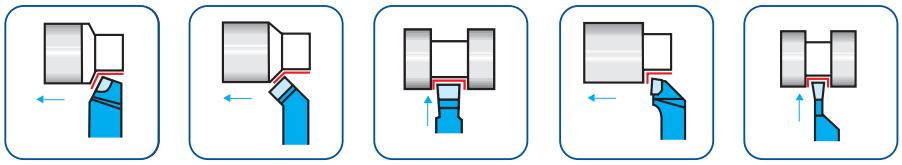
# 09.

# TORNEADO
Turning
Tournage

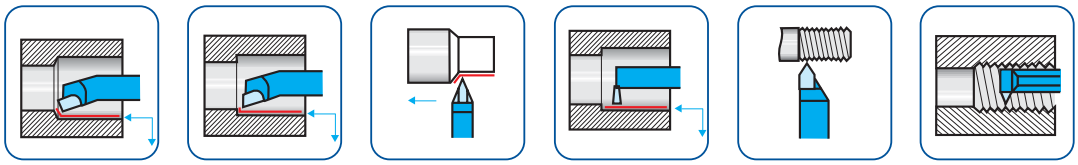

**HERRAMIENTAS SOLDADAS**
Brazed Turning Tools
Outils de tour plaquette soudé 491

**CUCHILLAS HSSE**
HSSE Turning Blades
Outils de tour HSSE 497



**ISO 1** - 8901 | **ISO 2** - 8900 | **ISO 4** - 8904 | **ISO 6** - 8910 | **ISO 7** - 8920



**ISO 8** - 8925 | **ISO 9** - 8930 | **ISO 10** - 8940 | **ISO 11** - 8950 | **ISO 12** - 8960 | **ISO 13** - 8970

| P20 | | Avance 0,1-1,2 mm/rev. Feed Pas |
|---|---|---|
| Material | | Velocidad Corte Cutting Speed Vitesse de coupe (m/min.) |
| P | P.1 | 160 - 100 - 60 |
| | P.2 | 140 - 80 - 40 |
| | P.3 | 60 - 40 - 25 |
| | P.5 | 50 - 40 - 24 |
| M | | 50 - 40 - 24 |
| K | K.1 | 90 - 70 - 45 |
| | K.2 | 70 - 50 - 30 |

| M20 | | Avance 0,1-1,2 mm/rev. Feed Pas |
|---|---|---|
| Material | | Velocidad Corte Cutting Speed Vitesse de coupe (m/min.) |
| P | P.1 | 110 - 80 - 45 |
| | | |
| | | |
| P | P.5 | 40 - 30 - 20 |
| M | | 40 - 30 - 20 |
| K | K.1 | 100 - 60 - 40 |
| | K.2 | 80 - 50 - 25 |

| K10 | | Avance 0,1-1,2 mm/rev. Feed Pas |
|---|---|---|
| Material | | Velocidad Corte Cutting Speed Vitesse de coupe (m/min.) |
| K | K.1 | 140 - 100 - 50 |
| | K.2 | 120 - 80 - 40 |
| N | N.1 | 400-300-200 |
| | N.2 | |
| | N.3 | 400-300-200 |
| | N.4 | |
| | N.5 | 200-150-80 |

**Calidad P20**

**Especialmente destinada a mecanizados de gran precisión y semi-acabado en aceros al carbono y aleados, a grandes velocidades de corte y avances moderados.**

**P20 Quality**

**Specially destined for high precision and semi-finishing machining of carbon & alloy steels, at high cutting speeds and moderate feeds.**

**Qualité P20**

Notamment pour usinages haute précision et semi-finition en aciers au carbone et alliés, a hautes vitesses de coupe et avances modérés.

**Calidad M20**

**Especial para acabado y desbaste suave de aceros, aceros al manganeso, fundición y metales resistentes al calor o no ferrosos, a velocidades de corte medias o bajas.**

**M20 Quality**

**Special for finishing and soft roughing of steels, manganese-steels, cast iron and heat-resistant or non-ferrous materials, at medium or low cutting speed.**

**Qualité M20**

Spécial finition et ébauche tendre d´aciers, aciers au manganèse, fonte et aciers resistants au chaud et non ferreux à faibles où moyennes vitesses de coupe.

**Calidad K10**

**Especial para mecanizados de gran precisión y semi-acabado en fundición, aceros aleados, materiales de viruta corta y no ferrosos.**

**K10 Quality**

**Special for high precisión and semi-finishing machining of cast iron, alloyed steels, short chipping and non-ferrous materials.**

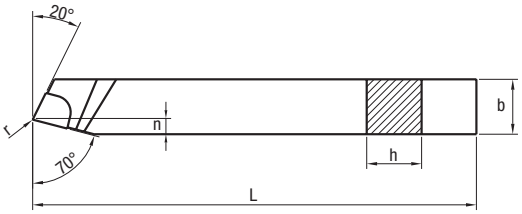
**Qualité K10**

Spéciale pour usinage d´haute précision et semi-finition fonte, alliages aciers, aciers copeaux courts et non ferreux.

# Ref. 8901

## HERRAMIENTA TORNEADO PLACA SOLDADA CILINDRADO 70°
70° Straight Brazed Turning Tool
Outil de tour plaquette soudé cylindrage 70°

DIN 4971 | ISO 1



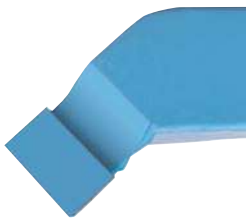

P P.1 P.2 - P.3 P.5 Aceros Steels Aciers
M INOX Stainless Steel Acier INOX
K Fundición Cast Iron Fonte

K Fundición Cast Iron Fonte
N N.1 - N.2 N.3 - N.4 N.5 Cobre / Copper / Cuivre Aluminio / Aluminium

| h mm | | b mm | | L mm | | R/L | n mm | r mm | Calidad Quality / Qualité P-20 | | Calidad Quality / Qualité K-10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | N° Art. | € | N° Art. | € |
| 10 | x | 10 | x | 90 | - | L | 4 | 0,2 | 55888 | 8,16 | 55889 | 8,16 |
| 10 | x | 10 | x | 90 | - | R | 4 | 0,2 | 55893 | 8,16 | 55891 | 8,16 |
| 12 | x | 12 | x | 100 | - | L | 5 | 0,4 | 55894 | 8,77 | 55897 | 8,77 |
| 12 | x | 12 | x | 100 | - | R | 5 | 0,4 | 55896 | 8,77 | 55899 | 8,77 |
| 16 | x | 16 | x | 110 | - | L | 6 | 0,4 | 55903 | 11,03 | 55905 | 11,03 |
| 16 | x | 16 | x | 110 | - | R | 6 | 0,4 | 55904 | 11,03 | 55906 | 11,03 |
| 20 | x | 20 | x | 125 | - | L | 8 | 0,8 | 55911 | 15,06 | 55913 | 15,06 |
| 20 | x | 20 | x | 125 | - | R | 8 | 0,8 | 55912 | 15,06 | 55914 | 15,06 |
| 25 | x | 25 | x | 140 | - | L | 10 | 0,8 | 55917 | 22,27 | 55919 | 22,27 |
| 25 | x | 25 | x | 140 | - | R | 10 | 0,8 | 55918 | 22,27 | 55920 | 22,27 |

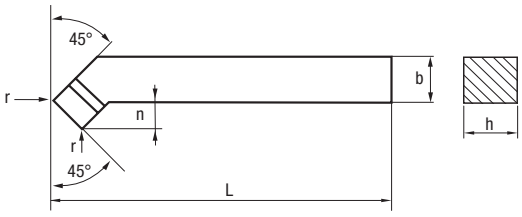
# Ref. 8900

## HERRAMIENTA TORNEADO PLACA SOLDADA ESCUADRADO 45°
45° Bent Brazed Turning Tool
Outil de tour plaquette soudé décolletage 45°



DIN 4972 | ISO 2






P P.1 P.2 - P.3 P.5 Aceros Steels Aciers
M INOX Stainless Steel Acier INOX
K Fundición Cast Iron Fonte

M INOX Stainless Steel Acier INOX

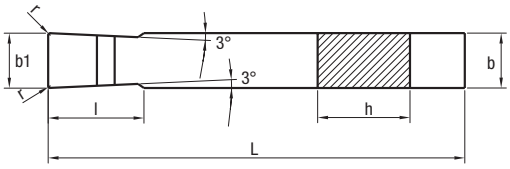
K Fundición Cast Iron Fonté
N N.1 - N.2 N.3 - N.4 N.5 Cobre / Copper / Cuivre Aluminio / Aluminium

| h mm | | b mm | | L mm | | R/L | n mm | r mm | Calidad Quality / Qualité P-20 | | Calidad Quality / Qualité M-20 | | Calidad Quality / Qualité K-10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | N° Art. | € | N° Art. | € | N° Art. | € |
| 12 | x | 12 | x | 100 | - | L | 7 | 0,4 | 13586 | 9,74 | 56073 | 9,74 | 29179 | 9,74 |
| 12 | x | 12 | x | 100 | - | R | 7 | 0,4 | 13585 | 9,74 | 56074 | 9,74 | 29153 | 9,74 |
| 16 | x | 16 | x | 110 | - | L | 8 | 0,4 | 13589 | 12,14 | 56076 | 12,14 | 29181 | 12,14 |
| 16 | x | 16 | x | 110 | - | R | 8 | 0,4 | 13588 | 12,14 | 56077 | 12,14 | 18258 | 12,14 |
| 20 | x | 20 | x | 125 | - | L | 10 | 0,8 | 13592 | 15,42 | 56078 | 15,42 | 13051 | 15,42 |
| 20 | x | 20 | x | 125 | - | R | 10 | 0,8 | 13591 | 15,42 | 56079 | 15,42 | 28343 | 15,42 |
| 25 | x | 25 | x | 140 | - | L | 12 | 0,8 | 13597 | 21,83 | 56080 | 21,83 | 29182 | 21,83 |
| 25 | x | 25 | x | 140 | - | R | 12 | 0,8 | 13594 | 21,83 | 56082 | 21,83 | 26003 | 21,83 |

# Ref. 8904

## HERRAMIENTA TORNEADO PLACA SOLDADA RANURADO EXTERIOR
Wide Face Square Nose Brazed Turning Tool
Outil de tour plaquette soudé rainurage exterieur

DIN 4976 | ISO 4

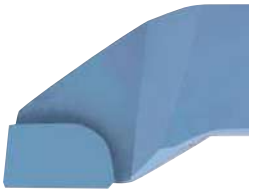



P P.1 P.2 - P.3 P.5 Aceros Steels Aciers
M INOX Stainless Steel Acier INOX
K Fundición Cast Iron Fonte
K Fundición Cast Iron Fonte
N N.1 - N.2 N.3 - N.4 N.5 Cobre / Copper / Cuivre Aluminio / Aluminium

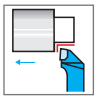
| h mm | | b mm | | L mm | r mm | l mm | b1 mm | Calidad Quality / Qualité P-20 | | Calidad Quality / Qualité K-10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | N° Art. | € | N° Art. | € |
| **20** | x | **12** | x | **125** | 0,4 | 20 | 12 | 55924 | **11,86** | 55926 | **11,86** |
| **25** | x | **16** | x | **140** | 0,4 | 25 | 16 | 55928 | **16,51** | 55932 | **16,51** |
| **32** | x | **20** | x | **170** | 0,4 | 32 | 20 | 55936 | **24,76** | 55938 | **24,76** |

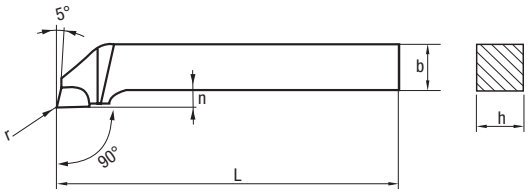
# Ref. 8910

## HERRAMIENTA TORNEADO PLACA SOLDADA ESCUADRADO 90°
90° Offset Side Brazed Turning Tool
Outil de tour plaquette soudé décolletage 90°



DIN 4980 | ISO 6






P P.1 P.2 - P.3 P.5 Aceros Steels Aciers
M INOX Stainless Steel Acier INOX
K Fundición Cast Iron Fonte
M INOX Stainless Steel Acier INOX
K Fundición Cast Iron Fonte
N N.1 - N.2 N.3 - N.4 N.5 Cobre / Copper / Cuivre Aluminio / Aluminium

| h mm | | b mm | | L mm | | R/L | n mm | r mm | Calidad Quality / Qualité P-20 | | Calidad Quality / Qualité M-20 | | Calidad Quality / Qualité K-10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | N° Art. | € | N° Art. | € | N° Art. | € |
| **10** | x | **10** | x | **090** | - | **L** | 4 | 0,2 | 13601 | **8,82** | 56083 | **8,82** | 29183 | **8,82** |
| **10** | x | **10** | x | **090** | - | **R** | 4 | 0,2 | 13600 | **8,82** | 56085 | **8,82** | 26488 | **8,82** |
| **12** | x | **12** | x | **100** | - | **L** | 5 | 0,4 | 13604 | **9,79** | 56086 | **9,79** | 29185 | **9,79** |
| **12** | x | **12** | x | **100** | - | **R** | 5 | 0,4 | 13603 | **9,79** | 56088 | **9,79** | 26707 | **9,79** |
| **16** | x | **16** | x | **110** | - | **L** | 6 | 0,4 | 13607 | **11,87** | 56089 | **11,87** | 13058 | **11,87** |
| **16** | x | **16** | x | **110** | - | **R** | 6 | 0,4 | 13606 | **11,87** | 56091 | **11,87** | 27460 | **11,87** |
| **20** | x | **20** | x | **125** | - | **L** | 8 | 0,8 | 13612 | **15,80** | 56092 | **15,80** | 10825 | **15,80** |
| **20** | x | **20** | x | **125** | - | **R** | 8 | 0,8 | 13609 | **15,80** | 56093 | **15,80** | 27461 | **15,80** |
| **25** | x | **25** | x | **140** | - | **L** | 10 | 0,8 | 13616 | **23,00** | 56094 | **23,00** | 17090 | **23,00** |
| **25** | x | **25** | x | **140** | - | **R** | 10 | 0,8 | 13615 | **23,00** | 56095 | **23,00** | 11181 | **23,00** |

# Ref. 8920

## HERRAMIENTA TORNEADO PLACA SOLDADA TRONZADO
Parting Brazed Turning Tool
Outil de tour plaquette soudé tronçonnage

DIN 4981 | ISO 7

P P.1 P.2 - P.3 P.5 Aceros Steels Aciers
M INOX Stainless Steel Acier INOX
K Fundición Cast Iron Fonte

M INOX Stainless Steel Acier INOX

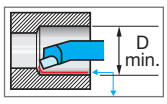
K Fundición Cast Iron Fonte
N N.1 - N.2 N.3 - N.4 N.5 Cobre / Copper / Cuivre Aluminio / Aluminium

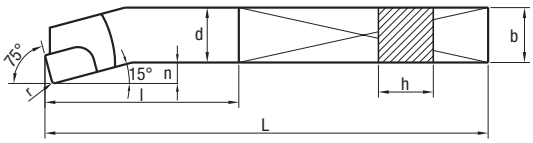
| h mm | | b mm | | L mm | | R/L | r mm | l mm | b1 mm | Calidad Quality / Qualité P-20 | | Calidad Quality / Qualité M-20 | | Calidad Quality / Qualité K-10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | N° Art. | € | N° Art. | € | N° Art. | € |
| 12 | x | 8 | x | 100 | - | L | 0,2 | 12 | 3 | 13619 | 9,15 | | | 28344 | 9,15 |
| 12 | x | 8 | x | 100 | - | R | 0,2 | 12 | 3 | 13618 | 9,15 | 56098 | 9,15 | 27519 | 9,15 |
| 16 | x | 10 | x | 110 | - | L | 0,2 | 14 | 4 | 13622 | 9,98 | | | 29186 | 9,98 |
| 16 | x | 10 | x | 110 | - | R | 0,2 | 14 | 4 | 13621 | 9,98 | 56100 | 9,98 | 19523 | 9,98 |
| 20 | x | 12 | x | 125 | - | L | 0,2 | 16 | 5 | 13625 | 11,54 | | | 29187 | 11,54 |
| 20 | x | 12 | x | 125 | - | R | 0,2 | 16 | 5 | 13624 | 11,54 | 56102 | 11,54 | 22685 | 11,54 |
| 25 | x | 16 | x | 140 | - | L | 0,3 | 20 | 6 | 13628 | 15,30 | | | 29189 | 15,30 |
| 25 | x | 16 | x | 140 | - | R | 0,3 | 20 | 6 | 13627 | 15,30 | 56104 | 15,30 | 29188 | 15,30 |

# Ref. 8925

## HERRAMIENTA TORNEADO PLACA SOLDADA MANDRINADO
Boring Straight Brazed Turning Tool
Outil de tour plaquette soudé alésage

DIN 4973 | ISO 8




P P.1 P.2 - P.3 P.5 Aceros Steels Aciers
M INOX Stainless Steel Acier INOX
K Fundición Cast Iron Fonte

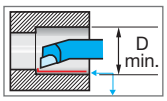
K Fundición Cast Iron Fonte
N N.1 - N.2 N.3 - N.4 N.5 Cobre / Copper / Cuivre Aluminio / Aluminium

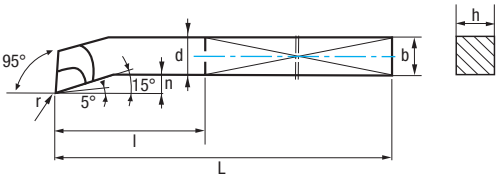
| h mm | | b mm | | L mm | n mm | r mm | D min. mm | Calidad Quality / Qualité P-20 | | Calidad Quality / Qualité K-10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | N° Art. | € | N° Art. | € |
| 8 | x | 8 | x | 125 | 3 | 0,4 | 14 | 38218 | 11,67 | 38220 | 11,67 |
| 10 | x | 10 | x | 150 | 4 | 0,4 | 18 | 38222 | 12,02 | 38224 | 12,02 |
| 12 | x | 12 | x | 180 | 5 | 0,4 | 21 | 38227 | 12,36 | 38391 | 12,36 |
| 16 | x | 16 | x | 210 | 6 | 0,4 | 27 | 38393 | 13,87 | 38395 | 13,87 |
| 20 | x | 20 | x | 250 | 8 | 0,4 | 34 | 38397 | 18,03 | 38399 | 18,03 |
| 25 | x | 25 | x | 300 | 10 | 0,8 | 43 | 38401 | 28,38 | 38403 | 28,38 |

# Ref. 8930

## HERRAMIENTA TORNEADO PLACA SOLDADA CILINDRADO INTERIOR
Internal Sharped Brazed Turning Tool
Outil de tour plaquette soudé cylindrage interieur

DIN 4974 | ISO 9




P P.1 P.2 - P.3 P.5 Aceros Steels Aciers
M INOX Stainless Steel Acier INOX
K Fundición Cast Iron Fonte

M INOX Stainless Steel Acier INOX

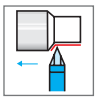
K Fundición Cast Iron Fonte
N N.1 - N.2 N.3 - N.4 N.5 Cobre / Copper / Cuivre Aluminio / Aluminium

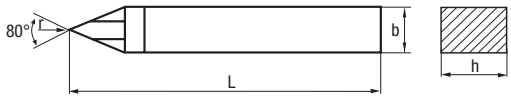
| h mm | | b mm | | L mm | d mm | n mm | r mm | l mm | D min. mm | Calidad Quality / Qualité P-20 | | Calidad Quality / Qualité M-20 | | Calidad Quality / Qualité K-10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | N° Art. | € | N° Art. | € | N° Art. | € |
| **8** | x | **8** | x | **125** | 8 | 3 | 0,2 | 40 | 14 | 13630 | **12,02** | 56114 | **12,02** | 14971 | **12,02** |
| **10** | x | **10** | x | **150** | 10 | 4 | 0,2 | 50 | 18 | 13631 | **11,87** | 56115 | **11,87** | 27462 | **11,87** |
| **12** | x | **12** | x | **180** | 12 | 5 | 0,2 | 63 | 21 | 13633 | **12,59** | 56116 | **12,59** | 27464 | **12,59** |
| **16** | x | **16** | x | **210** | 16 | 6 | 0,2 | 80 | 27 | 13634 | **15,00** | 56117 | **15,00** | 11152 | **15,00** |
| **20** | x | **20** | x | **250** | 20 | 8 | 0,4 | 100 | 34 | 13636 | **18,96** | 56118 | **18,96** | 11754 | **18,96** |
| **25** | x | **25** | x | **300** | 25 | 10 | 0,4 | 125 | 43 | 13639 | **28,80** | 56119 | **28,80** | 27518 | **28,80** |
| **32** | x | **32** | x | **355** | 32 | 12 | 0,8 | 160 | 52 | 13642 | **50,69** | 56121 | **50,69** | 13896 | **50,69** |

# Ref. 8940

## HERRAMIENTA TORNEADO PLACA SOLDADA CILINDRADO RECTO
Sharped Straight Brazed Turning Tool
Outil de tour plaquette soudé cylindrage droit

DIN 4975 | ISO 10






P P.1 P.2 - P.3 P.5 Aceros Steels Aciers
M INOX Stainless Steel Acier INOX
K Fundición Cast Iron Fonte

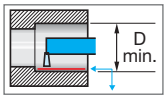
K Fundición Cast Iron Fonte
N N.1 - N.2 N.3 - N.4 N.5 Cobre / Copper / Cuivre Aluminio / Aluminium

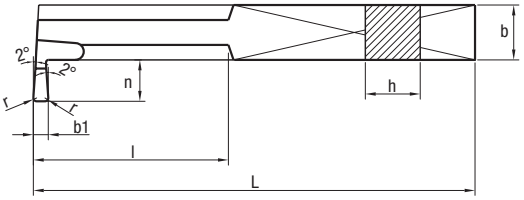
| h mm | | b mm | | L mm | r mm | Calidad Quality / Qualité P-20 | | Calidad Quality / Qualité K-10 | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | N° Art. | € | N° Art. | € |
| **16** | x | **10** | x | **110** | 0,2 | 13645 | **8,97** | 29190 | **8,97** |
| **20** | x | **12** | x | **125** | 0,4 | 13646 | **10,39** | 29191 | **10,39** |
| **25** | x | **16** | x | **140** | 0,4 | 13648 | **13,27** | 29192 | **13,27** |

# Ref. 8950

## HERRAMIENTA TORNEADO PLACA SOLDADA RANURADO INTERIOR
Internal Undercutting Brazed Turning Tool
Outil de tour plaquette soudé rainurage interieur

DIN 263 | ISO 11




**P** P.1 P.2 - P.3 P.5 **Aceros** Steels Aciers

**M** **INOX** Stainless Steel Acier INOX

**K** **Fundición** Cast Iron Fonte

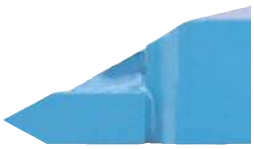
**K** **Fundición** Cast Iron Fonte

**N** N.1 - N.2 N.3 - N.4 N.5 **Cobre** / Copper / Cuivre **Aluminio** / Aluminium

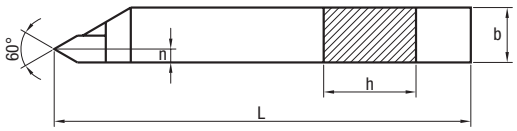
| h mm | | b mm | | L mm | n mm | r mm | b1 mm | D min. mm | Calidad Quality / Qualité P-20 | | Calidad Quality / Qualité K-10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | N° Art. | € | N° Art. | € |
| **12** | x | **12** | x | **180** | 10 | 0,2 | 4 | 32 | 38405 | **19,62** | 38407 | **19,62** |
| **16** | x | **16** | x | **210** | 12 | 0,2 | 5 | 40 | 38409 | **24,52** | 38411 | **24,52** |
| **20** | x | **20** | x | **250** | 16 | 0,4 | 6 | 50 | 38413 | **30,96** | 38415 | **30,96** |
| **25** | x | **25** | x | **300** | 20 | 0,4 | 8 | 63 | 38417 | **38,91** | 38419 | **38,91** |

# Ref. 8960

## HERRAMIENTA TORNEADO PLACA SOLDADA ROSCADO EXTERIOR
External Threading Brazed Turning Tool
Outil de tour plaquette soudé taraudage exterieur



DIN 282 | ISO 12




**P** P.1 P.2 - P.3 P.5 **Aceros** Steels Aciers

**M** **INOX** Stainless Steel Acier INOX

**K** **Fundición** Cast Iron Fonte

**K** **Fundición** Cast Iron Fonte

**N** N.1 - N.2 N.3 - N.4 N.5 **Cobre** / Copper / Cuivre **Aluminio** / Aluminium

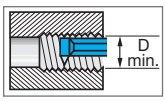
| h mm | | b mm | | L mm | | R/L | n mm | Calidad Quality / Qualité P-20 | | Calidad Quality / Qualité K-10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | N° Art. | € | N° Art. | € |
| **16** | x | **10** | x | **110** | - | **L** | 2,0 | 38422 | **10,90** | 38424 | **10,90** |
| **16** | x | **10** | x | **110** | - | **R** | 2,0 | 38421 | **10,90** | 38423 | **10,90** |
| **20** | x | **12** | x | **125** | - | **L** | 2,5 | 38426 | **12,77** | 38428 | **12,77** |
| **20** | x | **12** | x | **125** | - | **R** | 2,5 | 38425 | **12,77** | 38427 | **12,77** |
| **25** | x | **16** | x | **140** | - | **L** | 3,0 | 38430 | **16,62** | 38432 | **16,62** |
| **25** | x | **16** | x | **140** | - | **R** | 3,0 | 38429 | **16,62** | 38431 | **16,62** |

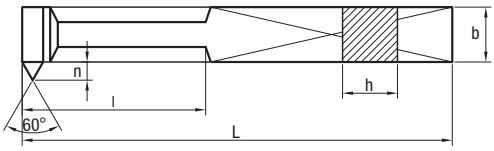
# Ref. 8970

## HERRAMIENTA TORNEADO PLACA SOLDADA ROSCADO INTERIOR
Internal Threading Brazed Turning Tool
Outil de tour plaquette soudé taraudage interieur

DIN 283

ISO 13



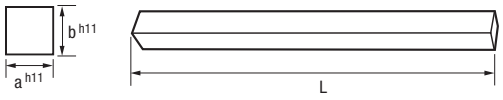

| | | |
|---|---|---|
| P | P.1 P.2 - P.3 P.5 | Aceros Steels Aciers |
| M | INOX Stainless Steel Acier INOX | |
| K | Fundición Cast Iron Fonte | |

| | | |
|---|---|---|
| K | Fundición Cast Iron Fonte | |
| N | N.1 - N.2 N.3 - N.4 N.5 | Cobre / Copper / Cuivre Aluminio / Aluminium |

| h mm | | b mm | | L mm | | R/L | n mm | D min. mm | Calidad Quality / Qualité P-20 | | Calidad Quality / Qualité K-10 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | N° Art. | € | N° Art. | € |
| **10** | x | **10** | x | **150** | - | **L** | 5 | 22 | 38434 | **18,70** | 38436 | **18,70** |
| **10** | x | **10** | x | **150** | - | **R** | 5 | 22 | 38433 | **18,70** | 38435 | **18,70** |
| **12** | x | **12** | x | **180** | - | **L** | 6 | 24 | 38438 | **19,04** | 38440 | **19,04** |
| **12** | x | **12** | x | **180** | - | **R** | 6 | 24 | 38437 | **19,04** | 38439 | **19,04** |
| **16** | x | **16** | x | **210** | - | **L** | 8 | 32 | 38442 | **25,03** | 38444 | **25,03** |
| **16** | x | **16** | x | **210** | - | **R** | 8 | 32 | 38441 | **25,03** | 38443 | **25,03** |
| **20** | x | **20** | x | **250** | - | **L** | 10 | 40 | 38446 | **29,71** | 38448 | **29,71** |
| **20** | x | **20** | x | **250** | - | **R** | 10 | 40 | 38445 | **29,71** | 38447 | **29,71** |
| **25** | x | **25** | x | **300** | - | **L** | 12 | 49 | 38450 | **42,14** | 38452 | **42,14** |
| **25** | x | **25** | x | **300** | - | **R** | 12 | 49 | 38449 | **42,14** | 38451 | **42,14** |

# Ref. 8990

## CUCHILLA CUADRADA TORNEADO
Square Turning Blade
Outil de tour carré

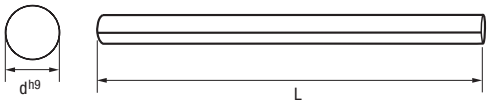



HSSE 10%Co | DIN 4964B | **Cuchillas Torno** Turning Tools Outils de tour

| a mm | | b mm | | L mm | N° Art. 10% Co | € |
|---|---|---|---|---|---|---|
| 6 | x | 6 | x | 100 | 35462 | 11,65 |
| 6 | x | 6 | x | 160 | 35463 | 17,39 |
| 6 | x | 6 | x | 200 | 35464 | 21,60 |
| 8 | x | 8 | x | 100 | 35465 | 19,58 |
| 8 | x | 8 | x | 160 | 35466 | 26,98 |
| 8 | x | 8 | x | 200 | 35467 | 32,19 |
| 10 | x | 10 | x | 100 | 35468 | 27,96 |
| 10 | x | 10 | x | 160 | 35469 | 41,56 |
| 10 | x | 10 | x | 200 | 35470 | 53,30 |
| 12 | x | 12 | x | 100 | 35471 | 34,14 |
| 12 | x | 12 | x | 160 | 35472 | 47,80 |
| 12 | x | 12 | x | 200 | 35473 | 62,13 |
| 14 | x | 14 | x | 200 | 35474 | 73,75 |
| 16 | x | 16 | x | 200 | 35475 | 91,82 |
| 18 | x | 18 | x | 200 | 35476 | 133,40 |
| 20 | x | 20 | x | 200 | 35477 | 171,95 |
| 25 | x | 25 | x | 200 | 35478 | 269,41 |

# Ref. 8991

## CUCHILLA REDONDA TORNEADO
Round Turning Blade
Outil de tour rond

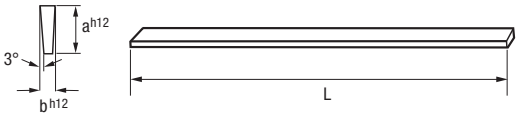



HSSE 10%Co | DIN 4964A | **Cuchillas Torno** Turning Tools Outils de tour

| d mm | | L mm | N° Art. 10% Co | € |
|---|---|---|---|---|
| 4 | x | 100 | 35479 | 9,91 |
| 5 | x | 100 | 35480 | 11,37 |
| 5 | x | 200 | 35481 | 22,80 |
| 6 | x | 100 | 35482 | 12,85 |
| 6 | x | 160 | 35484 | 19,31 |
| 6 | x | 200 | 35483 | 23,48 |
| 8 | x | 100 | 35485 | 16,81 |
| 8 | x | 160 | 35486 | 26,47 |
| 8 | x | 200 | 35487 | 31,46 |
| 10 | x | 100 | 35488 | 24,90 |
| 10 | x | 160 | 35489 | 44,19 |
| 10 | x | 200 | 35490 | 54,63 |
| 12 | x | 100 | 35491 | 27,22 |
| 12 | x | 200 | 35492 | 70,66 |
| 14 | x | 200 | 35493 | 98,51 |
| 16 | x | 200 | 35494 | 103,70 |
| 18 | x | 200 | 35495 | 179,99 |
| 20 | x | 200 | 35497 | 181,31 |

# Ref. 8992

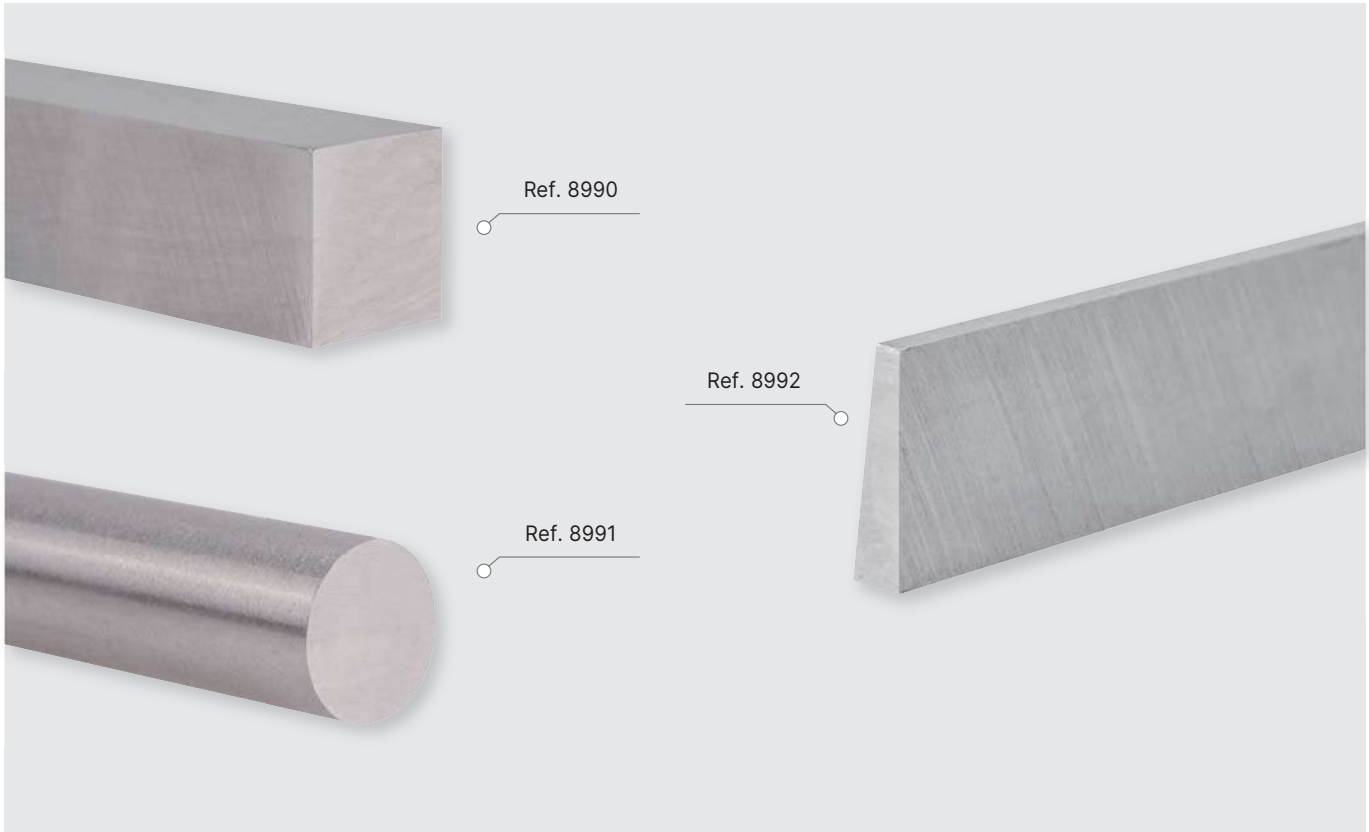
## CUCHILLA TRAPEZOIDAL TORNEADO
Trapezoidal Turning Blade
Outil de tour trapézoïdal




HSSE 10%Co

DIN 4964E

| a mm | | b mm | | L mm | N° Art. 10% Co | € |
|---|---|---|---|---|---|---|
| **10** | x | **2,50** | x | **100** | 13690 | **19,47** |
| **12** | x | **3,00** | x | **100** | 13691 | **21,53** |
| **12** | x | **3,00** | x | **160** | 13693 | **30,80** |
| **16** | x | **4,00** | x | **100** | 13782 | **31,23** |
| **16** | x | **4,00** | x | **160** | 13786 | **63,40** |
| **20** | x | **5,00** | x | **160** | 13787 | **78,29** |
| **20** | x | **5,00** | x | **200** | 14213 | **108,14** |
| **25** | x | **6,00** | x | **160** | 14225 | **105,51** |



# 10.

# PLAQUITAS MD

## HM Inserts

## Plaquettes carbure


**INFORMACIÓN TÉCNICA**
Technical Information
Information technique 500

**TALADRADO**
Drilling
Perçage 505

**TORNEADO**
Turning
Tournage 522

**TRONZADO Y RANURADO**
Parting & Grooving
Tronçonnage et Rainurage 571

**ROSCADO**
Threading
Taraudage 580

**FRESADO**
Milling
Fraisage 591

## TABLA USO BROCAS DE CABEZA INTERCAMBIABLE
Drill Bits With Interchangeable Heads Use Table - Tableau usage forets à tête interchangeable

● **Uso Recomendado** / **Recommended Use** / Utilisation conseillée
○ **Uso Alternativo** / **Alternative Use** / Option d´emploi

| Ref. | | Pag. | DIN | Tipo Type | Material | Recubr. Coating Revêt. | P | | | | | M | K | | S | N | | | | | | | F | H |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | P.1 | P.2 | P.3 | P.4 | P.5 | | K.1 | K.2 | | N.1 | N.2 | N.3 | N.4 | N.5 | N.6 | N.7 | | |
| 8380 New! | | 510 | | | Micro-grano | ALTIN | ● | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | ● | ● | ● | ● | | |
| 8381 New! | | 511 512 513 | ISO 9766 | 3XD 5XD 8XD | | | | | | | | | | | | | | | | | | | | |



## TABLA USO PLAQUITAS MD
HM Inserts Use Table - Tableau usage Plaquettes carbure

# TALADRADO - Drilling - Perçage

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8450 | | 515 | | WCMX |
| 8425 | | 515 | | ISO 9766 (3XD) |
| 8465 | | 517 | | SOGX |
| 8470 | | 517 | | SOMX |
| 8475 | | 518 | | TOMX |
| 8460 | | 518 | | DOEX |
| 8431 | | 519 | | SPS.. 90° |
| 8432 | | 519 | | SPS.. 90° |
| 8430 | | 520 | | SPS.. 60° |

**Set 8431**

**SET PORTA-PLAQUITAS PUNTEADO SPS.. 90°**
SPS.. 90° Spotting Tool-Holder Set
Jeu de porte-plaquettes de repérage SPS.. 90°

519

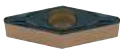
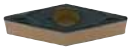
**Set 8432**

**SET PORTA-PLAQUITAS PUNTEADO SPS.. 90°**
SPS.. 90° Spotting Tool-Holder Set
Jeu de porte-plaquettes de repérage SPS.. 90°

519

# TORNEADO - Turning - Tournage

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8500 | | 530 | + | CCMT |
| 8501 | | 531 | + | CCGT |
| 8510 | | 532 | - | CNMG |
| 8512 | | 534 | - | CNMM |
| 8515 | | 534 | + | DCGT |
| 8520 | | 535 | + | DCMT |
| 8530 | | 536 | - | DNMG |
| 8535 | | 537 | - | KNUX |
| 8536 | New! | 538 | + | RCGT |
| 8537 | New! | 538 | + | RCMT |
| 8540 | | 539 | + | SCMT |
| 8550 | | 540 | - | SNMG |

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8554 | | 540 | + | SPUN |
| 8558 | | 541 | + | TCGT |
| 8560 | | 541 | + | TCMT |
| 8570 | | 542 | - | TNMG |
| 8571 | | 544 | + | TPMR |
| 8572 | | 544 | + | TPUN |
| 8575 |  | 545 | + | VBMT |
| 8576 | | 545 | + | VCGT |
| 8577 |  | 546 | + | VCMT |
| 8578 | | 546 | - | VNMG |
| 8580 | | 547 | - | WNMG |

## Porta-Plaquitas Torneado Exterior - External Turning Tool-Holder - Porte-Plaquettes tournage extérieur

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8726 | | 552 | - | CKJN -93° |
| 8706 | | 552 | + | CSBP. -75° |
| 8707 | | 553 | + | CTGP. -90° |
| 8792 | New! | 554 | - | DDJN. -93° |
| 8790 | | 555 | - | DWLN. -95° |
| 8710 | | 555 | - | MCLN. -95° |
| 8700 | | 556 | - | MTJN. -93° |
| 8724 | | 556 | - | MVJN. -93° |
| 8770 | | 557 | - | MWLN. -95° |
| 8709 | | 557 | - | PCLN. -95° |

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8725 | | 558 | - | PDJN. -93° |
| 8791 | | 558 | - | PSSN -45° |
| 8711 | New! | 559 | - | PWLN. -95° |
| 8704 | | 560 | + | SCLC. -95° |
| 8729 | | 561 | + | SDJC. -93° |
| 8705 | New! | 561 | + | SRDCN |
| 8723 | New! | 562 | + | SSSC. -45° |
| 8703 | | 563 | + | STJC. -93° |
| 8727 | | 563 | + | SVJB -93° |
| 8728 | | 564 | + | SVJC -93° |

## TABLA USO PLAQUITAS MD
HM Inserts Use Table - Tableau usage Plaquettes carbure

# TORNEADO - Turning - Tournage

**Porta-Plaquitas Torneado Interior** - Internal Turning Tool-Holder - Porte-Plaquettes tournage intérieur

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8715 | | 564 | + | S-CTFP. -90° |
| 8731 | | 565 | - | S-MCLN. -95° |
| 8732 | | 565 | - | S-MTUN. -93° |
| 8769 | | 566 | - | S-MVUN -93° |
| 8780 | | 567 | - | S-MWLN. -95° |
| 8800 | | 567 | - | S-MWLN. -95° |

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8733 | | 568 | - | S-PCLN. -95° |
| 8765 | | 568 | - | S-PDUN. -93° |
| 8751 | | 569 | + | S-SCLC. -95° |
| 8761 | | 569 | + | S-SDUC. -93° |
| 8718 | | 570 | + | S-STFC. -90° |
| 8768 | | 570 | + | S-SVUC. -93° |

| Set 8799 | 589 | **SET DE TORNEADO** - Turning Inserts Set - Jeu de tournage |
|---|---|---|

Set 1

Set 2

Set 3

# TRONZADO Y RANURADO - Parting & Grooving - Tonçonnage et rainurage

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8600 | | 572 | | LFMX |
| 8601 | New! | 573 | | MGMN |
| 8603 | | 574 | EXT. | TN..ER.A |
| 8606 | | 575 | INT. | TN..IR.A |
| 8850 | | 576 | | XLCF |
| 8860 | | 576 | | MS-EN |
| 8870 | | 577 | | XLCFN |

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8875 | | 577 | | XLCFN |
| 8865 | | 578 | | XMCG |
| 8866 | New! | 579 | | S-GMGG |

| Set 8605 | **SET RANURADO SEEGER®**<br>Grooving Set Seeger®<br>Jeu rainurage Seeger®<br> **Ref. 8603 EXT.**<br> **Ref. 8606 INT.** | 575 |
|---|---|---|

## ROSCADO - Threading - Taraudage

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8610 | | 584 | EXT. PERFIL TOTAL | MÉTRICA 60° |
| 8615 | | 584 | EXT. PERFIL PARCIAL | TN..ER.M 60° |
| 8620 | | 585 | INT. PERFIL TOTAL | MÉTRICA 60° |
| 8625 | | 585 | INT. PERFIL PARCIAL | TN..IR.M 60° |
| 8612 | | 586 | EXT. PERFIL TOTAL | WHITWORTH 55° |
| 8622 | | 586 | INT. PERFIL TOTAL | WHITWORTH 55° |

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8820 | | 588 | EXT. | SER |
| 8830 | | 588 | INT. | SIR |

| | | | |
|---|---|---|---|
| Set 8610 | | **SET ROSCADO EXTERIOR ROSCA MÉTRICA ISO**<br>ISO Metric External Threading Set<br>Jeu taraudage extérieur filetage métrique ISO<br> | 584 |

## FRESADO - Milling - Fraisage

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8231 | New! | 598 | | SLO-03 |
| 8232 | | 599 | | A50060 |
| 8233 | New! | 600 | | SWN-09 |
| 8234 | New! | 601 | | SSD-12 |
| 8230 | | 602 | | S45SE12F -45° |
| 8235 | | 603 | | W45SE123F -45° |
| 8240 | | 604 | | S45OD06 -45° |
| 8236 | New! | 605 | | S45SN12 |
| 8241 | | 606 | | S90XN08 |
| 8245 | | 607 | | S90AP10D -90° |

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8247 | | 608 | | S90AP10D-RF -90° |
| 8250 | | 609 | | S90AP16D -90° |
| 8255 | | 610 | | W90TP16D -90° |
| 8260 | | 611 | | W90TP22D -90° |
| 8261 | New! | 612 | | SLO-03 |
| 8262 | New! | 613 | | SSD-12 |
| 8264 | | 614 | | SAP-06 |
| 8265 | | 615 | | SAP-10D |
| 8270 | | 616 | | SAP-16D |
| 8275 | | 617 | | S90SN12 |

Cont. ➜

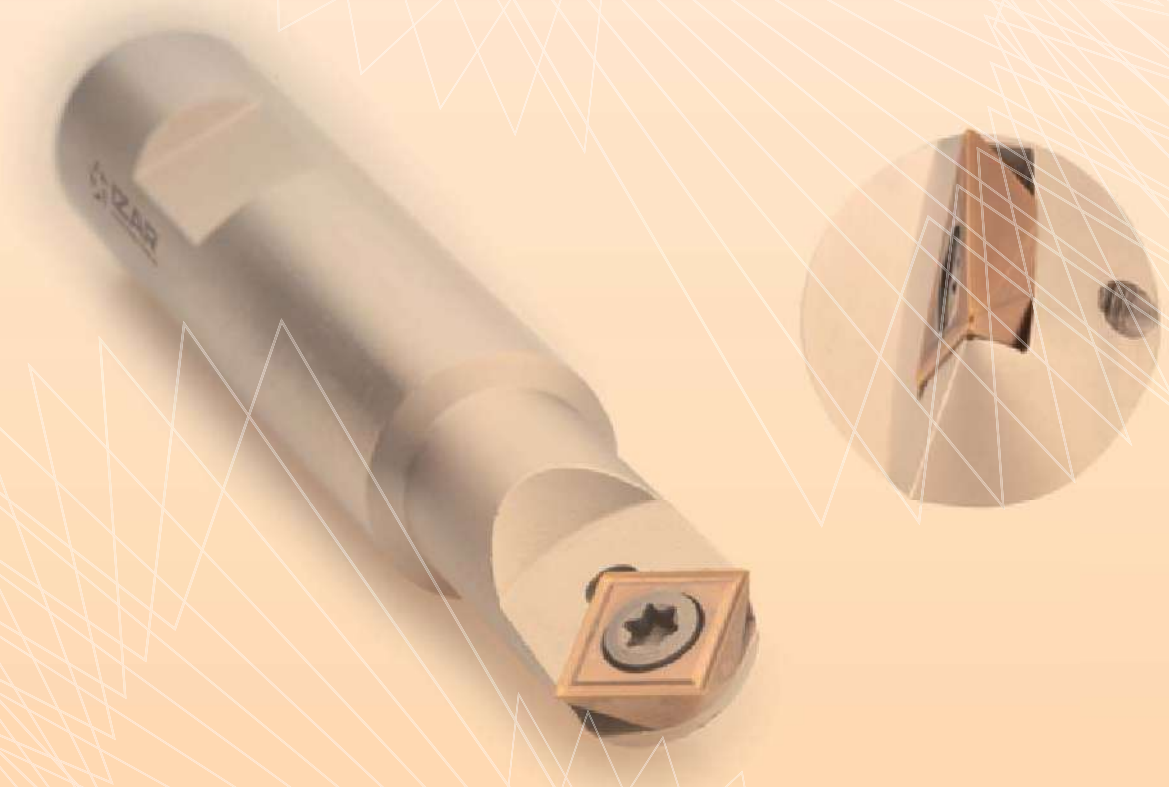
# FRESADO - Milling - Fraisage

← Cont.

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8280 | | 618 | | SCMORD |
| 8285 | | 619 | | SRD |
| 8290 | | 620 | | SRC |
| 8295 | | 621 | | SLC |
| 8296 | New! | 622 | | CHS.. A 45º |
| 8297 | New! | 623 | | CHS |
| 8633 | | 626 | + | APHT-16-FA |
| 8636 | | 626 | + | APET-10-FA |
| 8639 | | 626 | + | APKT-10-M |
| 8642 | | 627 | + | APKT-16 |
| 8645 | | 627 | + | LC |
| 8691 | New! | 628 | - | LOGX |
| 8648 | | 628 | + | ODMT |
| 8651 | | 629 | + | RC |
| 8654 | | 629 | + | RDHT |
| 8657 | | 629 | + | RDHW |

| Ref. | | Pag. | Geometría Geometry Géométrie | Tipo Type |
|---|---|---|---|---|
| 8693 | New! | 630 | + | SDMT |
| 8660 | | 630 | + | SEKN-12 |
| 8663 | | 631 | + | SEKR-12 |
| 8666 | | 631 | + | SEHT-12 |
| 8667 | | 632 | + | SEET-12 |
| 8669 | | 632 | + | SEHT-12 |
| 8672 | | 632 | + | SNHQ |
| 8673 | New! | 633 | - | SNMX |
| 8665 | New! | 633 | + | SPMG |
| 8675 | | 634 | + | TPKN |
| 8678 | | 634 | + | TPKR |
| 8679 | | 634 | - | XNMX |
| 8680 | | 635 | + | XOET |
| 8690 | | 635 | + | WNMW |
| 8692 | New! | 636 | - | WNMX |

# TALADRADO
Drilling
Perçage

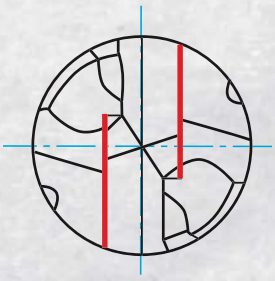


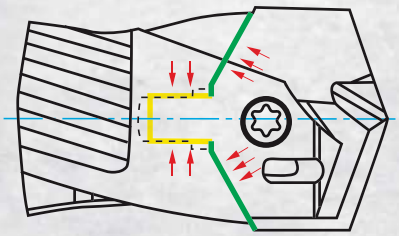
# BROCAS DE CABEZA INTERCAMBIABLE
## Drill Bits With Interchangeable Heads
## Forets à tête interchangeable

New!

Ref. 8380 Ref. 8381

**ALTO AVANCE**
High Feed
Avance élevée





**La estructura de posicionamiento triple, presenta una fuerza de conexión y una precisión de posicionamiento extraordinarias, y un diseño geométrico óptimo contribuyen a su excelente velocidad de perforación y durabilidad. Debido a la cabeza intercambiable, se puede lograr una combinación flexible de insertos para varias aplicaciones y soportes de diferentes longitudes, satisfaciendo así las necesidades de diferentes materiales a mecanizar, diferentes profundidades de perforación y otras aplicaciones, minimizando la inversión en herramientas.**

The triple positioning structure, featuring outstanding connection strength and positioning accuracy, and an optimal geometrical design contribute to its excellent drilling speed and durability. Due to the interchangeable head, a flexible combination of inserts for various applications and holders of different lengths can be achieved, thus meeting the needs of different materials to be machined, different drilling depths and other applications, minimising the investment in tools.

La structure de positionnement triple, caractérisée par une force de connexion et une précision de positionnement exceptionnelles, ainsi qu'un dessin géométrique optimal contribuent à l'excellente vitesse de perçage et à la durabilité. Grâce à la tête interchangeable, il est possible de combiner de manière flexible des plaquettes pour diverses applications et des supports de différentes longueurs, ce qui permet de répondre aux besoins des différents matériaux à usiner, des différentes profondeurs de perçage et d'autres applications, tout en minimisant l'investissement en termes d'outils.

**INFORMACIÓN TÉCNICA SOBRE BROCAS DE CABEZA INTERCAMBIABLE**
Technical Information on Drill Bits with Interchangeable Heads
Informations techniques sur les forets à tête interchangeable

# PROCEDIMIENTO DE INSTALACIÓN DEL INSERTO
## Insert installation procedure - Procédure d'installation de l'insert

**Valor recomendado de la fuerza de bloqueo del tornillo**
**Recommended Value of Screw Locking Force**
Valeur recommandée de la force de verrouillage de la vis

| Rango de diámetro<br>Range of Diameter<br>Plage de diamètres | Par de apriete (Nm)<br>Tightening Torque (Nm)<br>Couple de serrage (Nm) |
|---|---|
| 10,00 - 13,99 | 0,50 |
| 14,00 - 17,99 | 1,00 |
| 18,00 - 23,99 | 2,00 |
| 24,00 - 27,99 | 3,00 |
| 28,00 - 30,99 | 5,00 |
| 31,00 - 36,99 | 7,50 |
| 37,00 - 39,99 | 15,00 |

1. **En primer lugar, limpie el inserto y la ranura de montaje con aire comprimido.**
2. **Introduzca el inserto en la ranura de montaje del soporte y empújelo ligeramente.**
3. **Fije el inserto con el perno de sujeción. Se recomienda que los usuarios utilicen una llave dinamométrica en la medida de lo posible y los pares de apriete que se muestran en la figura.**

1. First, clean the insert and mounting groove with compressed air.
2. Load the insert into the mounting groove in the holder and slightly push the insert.
3. Fixt he insert with the fastening bolt. It is recommended that users use a torque wrench as far as possible and the tightening torques are shown in the figure.

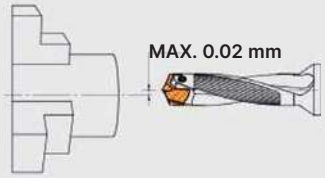
1. D'abord nettoyer l'insert et la rainure de montage à l'air comprimé.
2. Introduire l'insert dans la rainure de montage du support et pousser légèrement l'insert.
3. Fixer l'insert avec le boulon de fixation. Il est recommandé aux utilisateurs d'utiliser une clé dynamométrique dans la mesure du possible. Les couples de serrage sont indiqués dans la figure.

**Unas buenas condiciones de trabajo y un apriete correcto son requisitos para la vida útil y la precisión de los taladros.**

Good working condition & reliable clamping are requirements for service life and accuracy of drills.

De bonnes conditions de travail et un serrage fiable sont des conditions nécessaires à la durée de vie et à la précision des forets.

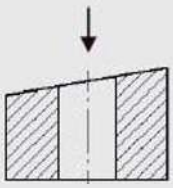
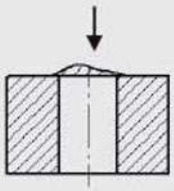
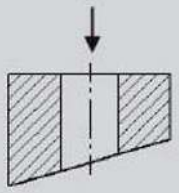
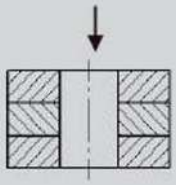
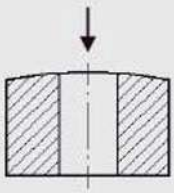
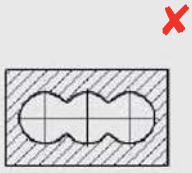
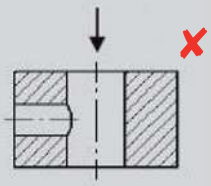
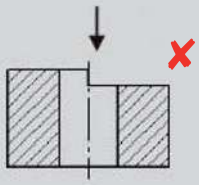
### Máx. descentrado y desalineación
Max. Runout and Misalignment
Max. excentration et désalignement

| **Descentrado** - **Runout** - Excentration | **Desalineación** - **Misalignment** - Désalignement |
|---|---|
| |  |

### Presión de refrigeración
Cooling Pressure
Pression de refroidissement

| **Refrigeración interna**<br>**Internal Cooling**<br>Refroidissement interne | **Refrigeración externa**<br>**External Cooling**<br>Refroidissement externe | **Corte en seco**<br>**Dry Cutting**<br>Perçage à sec |
|---|---|---|
| | | |
| 3 x D: 5 bar ✓<br>5 x D: 10 bar ✓<br>8 x D: 15 bar ✓<br>10 x D: 20 bar ✓ | 3 x D: 5 bar ✓<br>5 x D: 10 bar ✗<br>8 x D: 15 bar ✗<br>10 x D: 20 bar ✗ | ✗<br>**Prohibido su uso en seco**<br>**Strictly prohibited for dry drilling**<br>Perçage à sec interdit |

# INFORMACIÓN TÉCNICA SOBRE BROCAS DE CABEZA INTERCAMBIABLE
## Technical Information on Drill Bits with Interchangeable Heads
## Informations techniques sur les forets à tête interchangeable

| Condiciones de funcionamiento<br>Operating Condition<br>Conditions de fonctionnement | Instrucciones<br>Instructions<br>Instructions | Condiciones de funcionamiento<br>Operating Condition<br>Conditions de fonctionnement | Instrucciones<br>Instructions<br>Instructions |
|---|---|---|---|
|  | **La superficie de entrada está inclinada**<br>**The entry surface is slanted**<br>La surface d'entrée est inclinée<br>**Pendiente / Slope / Inclinaison** **< 3°** — **Velocidad de avance / Feed Rate / Vitesse d'avance** **50%** |  | **La superficie de entrada está soldada**<br>**The entry surface is welded**<br>La surface d'entrée est soudée<br>**Nivélelo mediante refrentado antes del mecanizado**<br>**Level it through spot facing before machining**<br>Le niveler par surfaçage avant de l'usiner |
|  | **La superficie de salida está inclinada**<br>**The exit surface is slanted**<br>La surface de sortie est inclinée<br>**Pendiente / Slope / Inclinaison** **< 3°** — **Velocidad de avance / Feed Rate / Vitesse d'avance** **50%** |  | **Placas apiladas**<br>**Stacked Plates**<br>Plaques empilées<br>**La pieza de trabajo se sujetará correctamente**<br>**The workpiece shall be properly clamped**<br>La pièce à usiner doit être correctement serrée |
|  | **La superficie de entrada está arqueada**<br>**The entry surface is arc**<br>La surface d'entrée est en arc<br>**Se permite el taladrado en el centro con avance reducido**<br>**Refrentado necesario si el punto de entrada no se encuentra en el centro del arco**<br>**Drilling at the center at reduced feed rate is allowed**<br>**Spot facing is required if the entry point is not at the center of the arc**<br>Le perçage au centre avec une vitesse d'avance réduite est autorisé<br>Un Spot facing est nécessaire si le point d'entrée n'est pas au centre de l'arc |  | **Agujero de taladro incompleto**<br>**Drill incomplete hole**<br>Perçage incomplet du trou<br>**No permitido**<br>**Not allowed**<br>Non autorisé |
|  | **Agujero pasante**<br>**Through hole**<br>Trou de passage<br>**No permitido**<br>**Not allowed**<br>Non autorisé |  | **Escalón en la superficie de entrada**<br>**Step on the entry surface**<br>Étape sur la surface d'entrée<br>**No permitido (el punto de entrada debe estar en un plano horizontal)**<br>**Not allowed (the entry point must be on a horizontal plane)**<br>Non autorisé (le point d'entrée doit être sur un plan horizontal) |

## PRECAUCIONES - Precautions - Précautions

**Proceso de taladrado para soportes con una longitud de 8xD.**

**Drilling process for holders with a length of 8xD.**

Processus de perçage pour les supports d'une longueur de 8xD.

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| | | | |
| **Taladre un orificio piloto de 1xD a 1,5xD con una broca**<br>**Drill a pilot hole to 1xD to 1,5xD with a short Drill Bit**<br>Percer un trou pilote de 1xD à 1,5xD à l'aide d'un foret court | **Entre en el orificio piloto a baja velocidad y bajo avance**<br>**Enter the pilot hole at a low speed and low feed rate**<br>Introduire le trou pilote à faible vitesse et à faible vitesse d'avance | **Mantenga el refrigerante durante 2 a 3 s**<br>**Keep the coolant lor 2 to 3 s**<br>Maintenir le liquide de refroidissement pendant 2 à 3 secondes | **Realice el taladrado a velocidad continua según los parámetros recomendados**<br>**Reduzca la velocidad y el avance**<br>**Carry out continuou Speed drilling according to the recommended parameters**<br>**Reduce the speed and feed**<br>Effectuer un forage à vitesse continue selon les paramètres recommandés<br>Réduire la vitesse et l'alimentation |

# CONDICIONES DE CORTE BROCAS DE CABEZA INTERCAMBIABLE
## Cutting Conditions Drill Bits with Interchangeable Heads
## Conditions de coupe forets à tête interchangeable

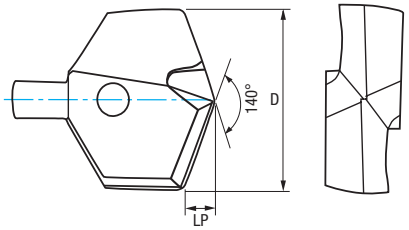
| GRUPO<br>GROUP<br>GROUPE | SUBGRUPO<br>SUBGROUP<br>S. GROUPE | MATERIALES<br>MATERIALS<br>MATÉRIAUX | VC<br>MD | Avances f/rev. (mm/rev) - Feed - Pas<br>10-11,99 | 12-13,99 | 14-15,99 | 16-19,99 | 20-25,99 | 26-32,99 | 33-39,99 |
|---|---|---|---|---|---|---|---|---|---|---|
| P | P.1 | **Aceros Construcción - Aceros Cementación**<br>**Structural Steels - Case Hardening Steels**<br>Aciers de construction - Aciers supérieurs | 80-150 | 0,14 | 0,16 | 0,2 | 0,25 | 0,28 | 0,3 | 0,32 |
| | | **Aceros al Carbono No Aleados - Aceros Bonificados**<br>**Unalloyed Carbon Steels - Heat-Treatable Steels**<br>Aciers au carbone sans alliage - Aciers supérieurs | 50-100 | 0,13 | 0,14 | 0,18 | 0,24 | 0,26 | 0,29 | 0,3 |
| | P.2 | **Aceros Aleados**<br>**Alloyed Steels**<br>Aciers alliés | 65-130 | 0,14 | 0,15 | 0,18 | 0,23 | 0,27 | 0,31 | 0,35 |
| | P.3 | **Aceros Aleados Tratados - Aceros Bonificados**<br>**Heat-Treatable Alloyed Steels**<br>Aciers alliés supérieurs | 45-90 | 0,13 | 0,15 | 0,18 | 0,2 | 0,24 | 0,24 | 0,26 |
| | P.4 | **Materiales resistentes al desgaste**<br>**Wear-Resistant Materials**<br>Matériaux résistant a l'usure | 15-40 | 0,08 | 0,1 | 0,1 | 0,12 | 0,14 | 0,16 | 0,16 |
| | P.5 | **INOX Ferríticos-Martensíticos Recocidos**<br>**Ferritic-Martensitic Annealed Stainless**<br>INOX Ferritiques-Martensitiques Recuits | 30-50 | 0,14 | 0,16 | 0,18 | 0,24 | 0,28 | 0,28 | 0,28 |
| | | **INOX Ferríticos-Martensíticos Templados**<br>**Ferritic-Martensitic Tempered Stainless**<br>INOX Ferritiques-Martensitiques Trempés | 60-90 | 0,12 | 0,12 | 0,14 | 0,18 | 0,22 | 0,22 | 0,22 |
| M | **Austeníticos**<br>**Austenitics**<br>Austénitiques | **INOX Austeníticos Recocidos**<br>**Austenitic Annealed Stainless**<br>INOX Austénitiques Recuits | 40-70 | 0,12 | 0,12 | 0,14 | 0,16 | 0,18 | 0,2 | 0,23 |
| | **Superduplex** | **<60% Ferrítico - Ferritic** - Ferritique | 40-70 | 0,1 | 0,1 | 0,12 | 0,14 | 0,16 | 0,16 | 0,19 |
| | | **>60% Ferrítico - Ferritic** - Ferritique | 20-60 | 0,09 | 0,09 | 0,1 | 0,12 | 0,14 | 0,14 | 0,17 |
| K | K.1 | **Fundición Gris**<br>**Grey Cast Iron**<br>Fonte grise | 70-140 | 0,25 | 0,29 | 0,37 | 0,41 | 0,45 | 0,48 | 0,5 |
| | K.2 | **Fundición Nodular**<br>**Nodular Cast Iron**<br>Fonte nodulaire | 65-120 | 0,25 | 0,29 | 0,37 | 0,41 | 0,45 | 0,48 | 0,5 |
| S | | **Aleaciones Termorresistentes (Titanio, Inconel...)**<br>**Heat-Resistant Alloys (Titanium, Inconel...)**<br>Alliages thermorésistants (Titane, Inconel...) | 25-45 | 0,08 | 0,1 | 0,14 | 0,16 | 0,18 | 0,2 | 0,22 |
| N | N.1 | **Cobre - Bronce - Latón Viruta Corta**<br>**Copper - Bronze - Brass (Short Chip)**<br>Cuivre - Bronze - Laiton (Copeaux courts) | 105-195 | 0,25 | 0,28 | 0,37 | 0,4 | 0,45 | 0,5 | 0,55 |
| | N.2 | **Cobre - Bronce - Latón Viruta Larga**<br>**Copper - Bronze - Brass (Long Chip)**<br>Cuivre - Bronze - Laiton (Copeaux longs) | 105-195 | 0,25 | 0,28 | 0,37 | 0,4 | 0,45 | 0,5 | 0,55 |
| | N.3 | **Al - Mg No Aleado**<br>**Unalloyed Al - Mg**<br>Al - Mg Sans alliage | 95-180 | 0,25 | 0,28 | 0,37 | 0,4 | 0,45 | 0,5 | 0,55 |
| | N.4 | **Aleaciones Al Si < 10%**<br>**Al Alloys Si < 10%**<br>Alliages Al Si < 10% | 95-180 | 0,25 | 0,28 | 0,37 | 0,4 | 0,45 | 0,5 | 0,55 |
| | N.5 | **Aleaciones Al Si > 10%**<br>**Al Alloys Si > 10%**<br>Alliages Al Si > 10% | 90-170 | 0,25 | 0,28 | 0,37 | 0,4 | 0,45 | 0,5 | 0,55 |
| | N.6 | **Termoplásticos**<br>**Thermoplastics**<br>Thermoplastiques | 105-195 | 0,25 | 0,28 | 0,37 | 0,4 | 0,45 | 0,5 | 0,55 |
| | N.7 | **Duroplásticos**<br>**Hard Plastics**<br>Plastiques durs | 105-195 | 0,25 | 0,28 | 0,37 | 0,4 | 0,45 | 0,5 | 0,55 |

# Ref. 8380

## CABEZA BROCA PUNTA INTERCAMBIABLE
Indexable Drill Insert
Tête foret à embout amovible

New!

**MD**/ HM Carbure Micrograno | ALTIN | 140° | Tol. k7 | IT9~IT10




| D mm | LP mm | N° Art. P | N° Art. M | N° Art. K | N° Art. N | | € |
|---|---|---|---|---|---|---|---|
| **10,00** | 1,80 | 56443 | 56449 | 56461 | 56469 | 1 | **107,86** |
| **10,20** | 1,90 | 56472 | 56475 | 56478 | 56479 | 1 | **107,86** |
| **10,50** | 1,90 | 56525 | 56561 | 56577 | 56580 | 1 | **107,86** |
| **11,00** | 2,00 | 56586 | 56589 | 56592 | 56595 | 1 | **110,79** |
| **11,50** | 2,10 | 56598 | 56601 | 56607 | 56613 | 1 | **110,79** |
| **12,00** | 2,20 | 56616 | 56619 | 56631 | 56635 | 1 | **115,17** |
| **12,50** | 2,30 | 56641 | 56705 | 56723 | 56748 | 1 | **115,17** |
| **13,00** | 2,40 | 56273 | 56279 | 56282 | 56285 | 1 | **117,73** |
| **13,50** | 2,50 | 56751 | 56863 | 56884 | 56887 | 1 | **117,73** |
| **14,00** | 2,50 | 56890 | 56893 | 56896 | 56899 | 1 | **125,04** |
| **14,50** | 2,60 | 56905 | 56975 | 56977 | 56980 | 1 | **125,04** |
| **15,00** | 2,70 | 56984 | 56991 | 57000 | 57038 | 1 | **129,07** |
| **15,50** | 2,80 | 57041 | 57044 | 57047 | 57050 | 1 | **129,07** |
| **16,00** | 2,90 | 56295 | 56298 | 56301 | 56307 | 1 | **134,92** |
| **16,50** | 3,00 | 57053 | 57056 | 57059 | 57062 | 1 | **134,92** |
| **17,00** | 3,10 | 57065 | 57067 | 57068 | 57071 | 1 | **134,92** |
| **17,50** | 3,20 | 57074 | 57077 | 57080 | 57083 | 1 | **134,92** |
| **18,00** | 3,30 | 56358 | 56370 | 56376 | 56382 | 1 | **141,50** |
| **18,50** | 3,40 | 57089 | 57095 | 57101 | 57107 | 1 | **141,50** |
| **19,00** | 3,50 | 57113 | 57119 | 57143 | 57159 | 1 | **143,69** |
| **19,50** | 3,50 | 57160 | 57166 | 57228 | 57242 | 1 | **143,69** |
| **20,00** | 3,60 | 54998 | 55001 | 55045 | 55057 | 1 | **151,74** |
| **20,50** | 3,70 | 57248 | 57254 | 57260 | 57266 | 1 | **151,74** |
| **21,00** | 3,80 | 57269 | 57272 | 57278 | 57296 | 1 | **157,59** |
| **21,50** | 3,90 | 57302 | 57324 | 57336 | 57348 | 1 | **157,59** |
| **22,00** | 4,00 | 55060 | 55063 | 55074 | 55078 | 1 | **172,58** |
| **22,50** | 4,10 | 57360 | 57372 | 57408 | 57420 | 1 | **172,58** |
| **23,00** | 4,20 | 57444 | 57468 | 57487 | 57492 | 1 | **179,16** |
| **23,50** | 4,30 | 57493 | 57498 | 57499 | 57502 | 1 | **179,16** |
| **24,00** | 4,40 | 55090 | 55096 | 55108 | 55117 | 1 | **182,08** |
| **24,50** | 4,50 | 57508 | 57511 | 57516 | 57519 | 1 | **182,08** |

| D mm | LP mm | N° Art. P | N° Art. M | N° Art. K | N° Art. N | | € |
|---|---|---|---|---|---|---|---|
| **25,00** | 4,50 | 57522 | 57528 | 57540 | 57543 | 1 | **183,91** |
| **25,50** | 4,60 | 57566 | 57569 | 57572 | 57575 | 1 | **183,91** |
| **26,00** | 4,70 | 55120 | 55123 | 55132 | 55138 | 1 | **204,02** |
| **26,50** | 4,80 | 57576 | 57578 | 57582 | 57588 | 1 | **204,02** |
| **27,00** | 4,90 | 57603 | 57609 | 57623 | 57626 | 1 | **208,41** |
| **27,50** | 5,00 | 57629 | 57631 | 57632 | 57634 | 1 | **208,41** |
| **28,00** | 5,10 | 57635 | 57637 | 57639 | 57641 | 1 | **227,06** |
| **28,50** | 5,20 | 57644 | 57645 | 57681 | 57684 | 1 | **227,06** |
| **29,00** | 5,30 | 57702 | 57726 | 57729 | 57732 | 1 | **230,71** |
| **29,50** | 5,40 | 57735 | 57742 | 57745 | 57748 | 1 | **230,71** |
| **30,00** | 5,50 | 55144 | 55244 | 55246 | 55254 | 1 | **237,29** |
| **30,50** | 5,60 | 57751 | 57754 | 57757 | 57760 | 1 | **237,29** |
| **31,00** | 5,60 | 57763 | 57766 | 57769 | 57772 | 1 | **259,59** |
| **31,50** | 5,70 | 57775 | 57778 | 57781 | 57798 | 1 | **259,59** |
| **32,00** | 5,80 | 57809 | 57811 | 57812 | 57814 | 1 | **266,54** |
| **32,50** | 5,90 | 57815 | 57817 | 57818 | 57820 | 1 | **266,54** |
| **33,00** | 6,00 | 55396 | 55402 | 55408 | 55417 | 1 | **272,39** |
| **33,50** | 6,10 | 57821 | 57823 | 57824 | 57826 | 1 | **272,39** |
| **34,00** | 6,20 | 57921 | 57933 | 57936 | 57945 | 1 | **296,89** |
| **34,50** | 6,30 | 57947 | 57950 | 57951 | 57953 | 1 | **296,89** |
| **35,00** | 6,40 | 57954 | 57956 | 57959 | 57960 | 1 | **300,18** |
| **35,50** | 6,50 | 57962 | 57963 | 57965 | 57966 | 1 | **300,18** |
| **36,00** | 6,60 | 55420 | 55429 | 55441 | 55447 | 1 | **306,76** |
| **36,50** | 6,60 | 57968 | 57969 | 57971 | 57972 | 1 | **306,76** |
| **37,00** | 6,70 | 57974 | 57977 | 57983 | 57989 | 1 | **346,98** |
| **37,50** | 6,80 | 57990 | 57992 | 57995 | 57999 | 1 | **346,98** |
| **38,00** | 6,90 | 58014 | 58023 | 58035 | 58052 | 1 | **356,12** |
| **38,50** | 7,00 | 58055 | 58056 | 58061 | 58064 | 1 | **356,12** |
| **39,00** | 7,10 | 58067 | 58083 | 58092 | 58107 | 1 | **359,78** |
| **39,50** | 7,20 | 58110 | 58119 | 58128 | 58131 | 1 | **359,78** |
| **39,99** | 7,30 | 58143 | 58156 | 58159 | 58165 | 1 | **359,78** |

P M K **En stock** / **In stock** / En stock

N **Bajo demanda** / **Upon request** / Sur demande

1. **El inserto intercambiable fácil de manipular, facilita el reemplazo del mismo en la propia máquina.**
2. **La combinación de posicionamiento del tornillo de bloqueo central, la ranura en V y la guia cilíndrica mantiene una fuerza de bloqueo y una fuerza de perforación consistentes, estables y fiables.**
3. **Los materiales óptimos, el recubrimiento de última generación y la tecnología de rectificado de precisión maximizan su rendimiento.**
4. **La construcción del inserto de alta resistencia lo hace apto para taladrar con altos avances.**
5. **Portaherramientas con mango ISO-9766.**

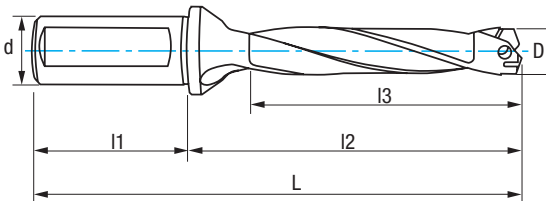
1. **The easy-to-handle interchangeable insert makes it easy to replace the insert on the machine itself.**
2. **The positioning combination of central locking screw, V-groove and cylindrical guide maintains consistent, stable and reliable locking force and drilling force.**
3. **Optimum materials, state-of-the-art coating and precision grinding technology maximise performance.**
4. **The heavy duty insert construction makes it suitable for high feed drilling.**
5. **Tool holder with ISO-9766 shank.**

1. La plaquette interchangeable, facile à manipuler, permet de la remplacer facilement sur la machine elle-même.
2. La combinaison de positionnement de la vis de blocage centrale, de la rainure en V et du guide cylindrique permet d'obtenir une force de blocage et une force de perçage cohérentes, stables et fiables.
3. Des matériaux optimaux, un revêtement de pointe et une technologie de rectification de précision maximisent les performances.
4. La construction robuste de la plaquette permet de réaliser des trous à avance élevée.
5. Porte-outils avec queue ISO-9766.

# Ref. 8381

## CUERPO BROCA PUNTA INTERCAMBIABLE REFRIGERACIÓN INTERIOR 3XD
## 3XD Internal Cooling Indexable Drill Body
## Corps foret à embout amovible lubrification interne 3XD

New!




3XD | ISO 9766

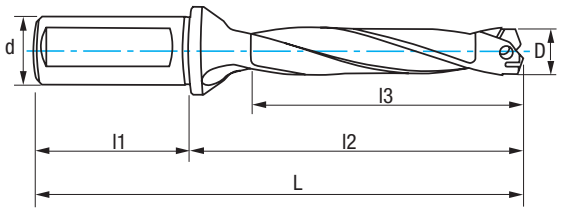
| D mm | L mm | l1 mm | l2 mm | l3 mm | d mm | | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| 10,00-10,49 | 96 | 48 | 48 | 31,50 | 16 | 1 | 58168 | 274,69 |
| 10,50-10,99 | 98 | 48 | 50 | 33,00 | 16 | 1 | 58180 | 286,09 |
| 11,00-11,49 | 100 | 48 | 52 | 34,50 | 16 | 1 | 58195 | 299,01 |
| 11,50-11,99 | 102 | 48 | 54 | 36,00 | 16 | 1 | 58204 | 311,93 |
| 12,00-12,49 | 105 | 48 | 57 | 37,50 | 16 | 1 | 58218 | 321,04 |
| 12,50-12,99 | 107 | 48 | 59 | 39,00 | 16 | 1 | 58228 | 330,16 |
| 13,00-13,49 | 109 | 48 | 61 | 40,50 | 16 | 1 | 55486 | 343,08 |
| 13,50-13,99 | 111 | 48 | 63 | 42,00 | 16 | 1 | 58281 | 356,38 |
| 14,00-14,49 | 113 | 48 | 65 | 43,50 | 16 | 1 | 58357 | 365,12 |
| 14,50-14,99 | 115 | 48 | 67 | 45,00 | 16 | 1 | 58366 | 374,62 |
| 15,00-15,99 | 122 | 50 | 72 | 48,00 | 20 | 1 | 58374 | 398,93 |
| 16,00-16,99 | 127 | 50 | 77 | 51,00 | 20 | 1 | 55509 | 412,23 |
| 17,00-17,99 | 131 | 50 | 81 | 54,00 | 20 | 1 | 58381 | 426,29 |
| 18,00-18,99 | 141 | 56 | 85 | 57,00 | 25 | 1 | 55628 | 443,00 |
| 19,00-19,99 | 146 | 56 | 90 | 60,00 | 25 | 1 | 58388 | 457,06 |
| 20,00-20,99 | 150 | 56 | 94 | 63,00 | 25 | 1 | 55764 | 473,02 |
| 21,00-21,99 | 154 | 56 | 98 | 66,00 | 25 | 1 | 58393 | 489,74 |
| 22,00-22,99 | 158 | 56 | 102 | 69,00 | 25 | 1 | 55895 | 504,17 |
| 23,00-23,99 | 163 | 56 | 107 | 72,00 | 25 | 1 | 58402 | 521,27 |
| 24,00-24,99 | 172 | 60 | 112 | 75,00 | 32 | 1 | 55907 | 554,70 |
| 25,00-25,99 | 176 | 60 | 116 | 78,00 | 32 | 1 | 58410 | 569,90 |
| 26,00-26,99 | 181 | 60 | 121 | 81,00 | 32 | 1 | 56041 | 582,82 |
| 27,00-27,99 | 185 | 60 | 125 | 84,00 | 32 | 1 | 58414 | 598,78 |
| 28,00-28,99 | 189 | 60 | 129 | 87,00 | 32 | 1 | 58429 | 626,89 |
| 29,00-29,99 | 193 | 60 | 133 | 90,00 | 32 | 1 | 58435 | 644,37 |
| 30,00-30,99 | 198 | 60 | 138 | 93,00 | 32 | 1 | 56195 | 661,09 |
| 31,00-31,99 | 202 | 60 | 142 | 96,00 | 32 | 1 | 58444 | 673,24 |
| 32,00-32,99 | 206 | 60 | 146 | 99,00 | 32 | 1 | 58450 | 687,68 |
| 33,00-33,99 | 211 | 60 | 151 | 102,00 | 32 | 1 | 56229 | 704,78 |
| 34,00-34,99 | 226 | 70 | 156 | 105,00 | 40 | 1 | 58459 | 724,15 |
| 35,00-35,99 | 230 | 70 | 160 | 108,00 | 40 | 1 | 58468 | 746,95 |
| 36,00-36,99 | 234 | 70 | 164 | 111,00 | 40 | 1 | 56241 | 765,19 |
| 37,00-37,99 | 239 | 70 | 169 | 114,00 | 40 | 1 | 58477 | 786,08 |
| 38,00-38,99 | 243 | 70 | 173 | 117,00 | 40 | 1 | 58485 | 802,04 |
| 39,00-39,99 | 252 | 70 | 182 | 123,00 | 40 | 1 | 58492 | 823,32 |

| Ref. 8805 | | Ref. 8801 | |
|---|---|---|---|
| **TP-06 M2×9** Art. 70331 - **9,99 €** | 1 | **ZTP-06** Art. 70442 **12,62 €** | 1 |
| **TP-06 M2×10** Art. 70346 - **9,99 €** | | | |
| **TP-06 M2×11,5** Art. 70356 - **9,99 €** | | | |
| **TP-07 M2,5×13** Art. 70359 - **9,99 €** | | **ZTP-07** Art. 70445 **12,62 €** | |
| **TP-07 M2,5×15** Art. 70362 - **9,99 €** | | | |
| **TP-09 M3×16** Art. 70364 **9,99 €** | | **ZTP-09** Art. 70448 **13,64 €** | |
| **TP-09 M3×17** Art. 70370 - **9,99 €** | | | |
| **TP-09 M3×20** Art. 70373 - **9,99 €** | | | |
| **TP-10 M3,5×22** Art. 70376 - **9,99 €** | | **ZTP-10** Art. 70454 **14,70 €** | |
| **TP-10 M3,5×24** Art. 70382 - **9,99 €** | | | |
| **TP-15 M4×26** Art. 70388 - **9,99 €** | | **ZTP-15** Art. 70457 **45,97 €** | |
| **TP-20 M5×29** Art. 70397 - **9,99 €** | | **ZTP-20** Art. 70466 **45,97 €** | |
| **TP-20 M5×32** Art. 70425 - **9,99 €** | | | |
| **TP-25 M6×35** Art. 70434 - **9,99 €** | | **ZTP-25** Art. 70472 **45,97 €** | |

# Ref. 8381

## CUERPO BROCA PUNTA INTERCAMBIABLE REFRIGERACIÓN INTERIOR 5XD
5XD Internal Cooling Indexable Drill Body
Corps foret à embout amovible lubrification interne 5XD

New!




5XD

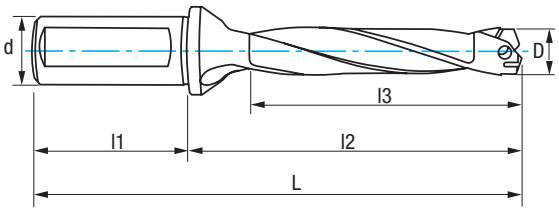
| D mm | L mm | l1 mm | l2 mm | l3 mm | d mm | | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| 10,00-10,49 | 117 | 48 | 69 | 52,50 | 16 | 1 | 58174 | 316,11 |
| 10,50-10,99 | 120 | 48 | 72 | 55,00 | 16 | 1 | 58185 | 327,12 |
| 11,00-11,49 | 123 | 48 | 75 | 57,50 | 16 | 1 | 58197 | 338,14 |
| 11,50-11,99 | 126 | 48 | 78 | 60,00 | 16 | 1 | 58213 | 349,54 |
| 12,00-12,49 | 130 | 48 | 82 | 62,50 | 16 | 1 | 58222 | 359,42 |
| 12,50-12,99 | 133 | 48 | 85 | 65,00 | 16 | 1 | 58267 | 368,54 |
| 13,00-13,49 | 136 | 48 | 88 | 67,50 | 16 | 1 | 55501 | 379,93 |
| 13,50-13,99 | 139 | 48 | 91 | 70,00 | 16 | 1 | 58290 | 392,09 |
| 14,00-14,49 | 142 | 48 | 94 | 72,50 | 16 | 1 | 58360 | 403,11 |
| 14,50-14,99 | 145 | 48 | 97 | 75,00 | 16 | 1 | 58369 | 412,61 |
| 15,00-15,99 | 154 | 50 | 104 | 80,00 | 20 | 1 | 58378 | 442,62 |
| 16,00-16,99 | 161 | 50 | 111 | 85,00 | 20 | 1 | 55576 | 458,20 |
| 17,00-17,99 | 167 | 50 | 117 | 90,00 | 20 | 1 | 58384 | 474,16 |
| 18,00-18,99 | 179 | 56 | 123 | 95,00 | 25 | 1 | 55678 | 493,53 |
| 19,00-19,99 | 186 | 56 | 130 | 100,00 | 25 | 1 | 58390 | 510,63 |
| 20,00-20,99 | 192 | 56 | 136 | 105,00 | 25 | 1 | 55767 | 528,11 |
| 21,00-21,99 | 198 | 56 | 142 | 110,00 | 25 | 1 | 58396 | 546,73 |
| 22,00-22,99 | 204 | 56 | 148 | 115,00 | 25 | 1 | 55898 | 565,34 |
| 23,00-23,99 | 211 | 56 | 155 | 120,00 | 25 | 1 | 58405 | 585,48 |
| 24,00-24,99 | 222 | 60 | 162 | 125,00 | 32 | 1 | 55908 | 624,61 |
| 25,00-25,99 | 228 | 60 | 168 | 130,00 | 32 | 1 | 58411 | 643,23 |
| 26,00-26,99 | 235 | 60 | 175 | 135,00 | 32 | 1 | 56068 | 661,47 |
| 27,00-27,99 | 241 | 60 | 181 | 140,00 | 32 | 1 | 58417 | 680,46 |
| 28,00-28,99 | 247 | 60 | 187 | 145,00 | 32 | 1 | 58431 | 710,10 |
| 29,00-29,99 | 253 | 60 | 193 | 150,00 | 32 | 1 | 58438 | 730,99 |
| 30,00-30,99 | 260 | 60 | 200 | 155,00 | 32 | 1 | 56207 | 754,17 |
| 31,00-31,99 | 266 | 60 | 206 | 160,00 | 32 | 1 | 58446 | 773,17 |
| 32,00-32,99 | 272 | 60 | 212 | 165,00 | 32 | 1 | 58453 | 793,30 |
| 33,00-33,99 | 279 | 60 | 219 | 170,00 | 32 | 1 | 56231 | 820,66 |
| 34,00-34,99 | 296 | 70 | 226 | 175,00 | 40 | 1 | 58462 | 839,65 |
| 35,00-35,99 | 302 | 70 | 232 | 180,00 | 40 | 1 | 58471 | 862,45 |
| 36,00-36,99 | 308 | 70 | 238 | 185,00 | 40 | 1 | 56243 | 885,25 |
| 37,00-37,99 | 315 | 70 | 245 | 190,00 | 40 | 1 | 58480 | 909,18 |
| 38,00-38,99 | 321 | 70 | 251 | 195,00 | 40 | 1 | 58486 | 937,30 |
| 39,00-39,99 | 252 | 70 | 264 | 205,00 | 40 | 1 | 58495 | 965,03 |

| Ref. 8805 | | Ref. 8801 | |
|---|---|---|---|
| **TP-06 M2×9** Art. 70331 - **9,99 €** | 1 | **ZTP-06** Art. 70442 **12,62 €** | 1 |
| **TP-06 M2×10** Art. 70346 - **9,99 €** | | | |
| **TP-06 M2×11,5** Art. 70356 - **9,99 €** | | | |
| **TP-07 M2,5×13** Art. 70359 - **9,99 €** | | **ZTP-07** Art. 70445 **12,62 €** | |
| **TP-07 M2,5×15** Art. 70362 - **9,99 €** | | | |
| **TP-09 M3×16** Art. 70364 **9,99 €** | | **ZTP-09** Art. 70448 **13,64 €** | |
| **TP-09 M3×17** Art. 70370 - **9,99 €** | | | |
| **TP-09 M3×20** Art. 70373 - **9,99 €** | | | |
| **TP-10 M3,5×22** Art. 70376 - **9,99 €** | | **ZTP-10** Art. 70454 **14,70 €** | |
| **TP-10 M3,5×24** Art. 70382 - **9,99 €** | | | |
| **TP-15 M4×26** Art. 70388 - **9,99 €** | | **ZTP-15** Art. 70457 **45,97 €** | |
| **TP-20 M5×29** Art. 70397 - **9,99 €** | | **ZTP-20** Art. 70466 **45,97 €** | |
| **TP-20 M5×32** Art. 70425 - **9,99 €** | | | |
| **TP-25 M6×35** Art. 70434 - **9,99 €** | | **ZTP-25** Art. 70472 **45,97 €** | |

# Ref. 8381

## CUERPO BROCA PUNTA INTERCAMBIABLE REFRIGERACIÓN INTERIOR 8XD
## 8XD Internal Cooling Indexable Drill Body
## Corps foret à embout amovible lubrification interne 8XD

New!




8XD

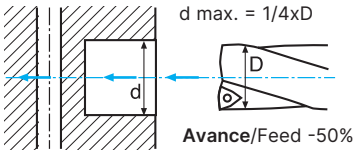
ISO 9766

| D mm | L mm | l1 mm | l2 mm | l3 mm | d mm | | N° Art. HSS | € |
|---|---|---|---|---|---|---|---|---|
| 10,00-10,49 | 148 | 48 | 100 | 84,00 | 16 | 1 | 58177 | 379,17 |
| 10,50-10,99 | 153 | 48 | 105 | 88,00 | 16 | 1 | 58189 | 392,47 |
| 11,00-11,49 | 158 | 48 | 110 | 92,00 | 16 | 1 | 58203 | 406,15 |
| 11,50-11,99 | 162 | 48 | 114 | 96,00 | 16 | 1 | 58216 | 419,07 |
| 12,00-12,49 | 167 | 48 | 119 | 100,00 | 16 | 1 | 58227 | 431,23 |
| 12,50-12,99 | 172 | 48 | 124 | 104,00 | 16 | 1 | 58272 | 442,24 |
| 13,00-13,49 | 176 | 48 | 128 | 108,00 | 16 | 1 | 55507 | 455,92 |
| 13,50-13,99 | 181 | 48 | 133 | 112,00 | 16 | 1 | 58354 | 470,36 |
| 14,00-14,49 | 186 | 48 | 138 | 116,00 | 16 | 1 | 58363 | 483,66 |
| 14,50-14,99 | 190 | 48 | 142 | 120,00 | 16 | 1 | 58372 | 495,05 |
| 15,00-15,99 | 202 | 50 | 152 | 128,00 | 20 | 1 | 58375 | 515,19 |
| 16,00-16,99 | 212 | 50 | 162 | 136,00 | 20 | 1 | 55600 | 530,77 |
| 17,00-17,99 | 221 | 50 | 171 | 144,00 | 20 | 1 | 58387 | 547,11 |
| 18,00-18,99 | 236 | 56 | 180 | 152,00 | 25 | 1 | 55752 | 585,10 |
| 19,00-19,99 | 246 | 56 | 190 | 160,00 | 25 | 1 | 58392 | 604,48 |
| 20,00-20,99 | 255 | 56 | 199 | 168,00 | 25 | 1 | 55773 | 621,95 |
| 21,00-21,99 | 264 | 56 | 208 | 176,00 | 25 | 1 | 58399 | 645,51 |
| 22,00-22,99 | 273 | 56 | 217 | 184,00 | 25 | 1 | 55901 | 662,23 |
| 23,00-23,99 | 283 | 56 | 227 | 192,00 | 25 | 1 | 58408 | 681,22 |
| 24,00-24,99 | 297 | 60 | 237 | 200,00 | 32 | 1 | 56017 | 724,53 |
| 25,00-25,99 | 306 | 60 | 246 | 208,00 | 32 | 1 | 58413 | 746,95 |
| 26,00-26,99 | 316 | 60 | 256 | 216,00 | 32 | 1 | 56128 | 768,23 |
| 27,00-27,99 | 325 | 60 | 265 | 224,00 | 32 | 1 | 58420 | 791,40 |
| 28,00-28,99 | 334 | 60 | 274 | 232,00 | 32 | 1 | 58432 | 825,22 |
| 29,00-29,99 | 343 | 60 | 283 | 240,00 | 32 | 1 | 58441 | 850,67 |
| 30,00-30,99 | 353 | 60 | 293 | 248,00 | 32 | 1 | 56219 | 884,49 |
| 31,00-31,99 | 362 | 60 | 302 | 256,00 | 32 | 1 | 58447 | 915,64 |
| 32,00-32,99 | 371 | 60 | 311 | 264,00 | 32 | 1 | 58456 | 944,14 |
| 33,00-33,99 | 381 | 60 | 321 | 272,00 | 32 | 1 | 56235 | 972,63 |
| 34,00-34,99 | 401 | 70 | 331 | 280,00 | 40 | 1 | 58465 | 1.002,27 |
| 35,00-35,99 | 410 | 70 | 340 | 288,00 | 40 | 1 | 58474 | 1.046,34 |
| 36,00-36,99 | 419 | 70 | 349 | 296,00 | 40 | 1 | 56255 | 1.075,59 |
| 37,00-37,99 | 429 | 70 | 359 | 304,00 | 40 | 1 | 58483 | 1.105,61 |
| 38,00-38,99 | 438 | 70 | 368 | 312,00 | 40 | 1 | 58489 | 1.135,62 |
| 39,00-39,99 | 457 | 70 | 387 | 328,00 | 40 | 1 | 58498 | 1.164,50 |

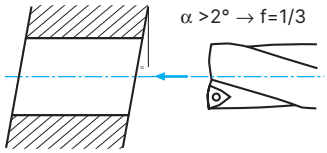
| Ref. 8805 | | Ref. 8801 | |
|---|---|---|---|
| TP-06 M2×9 Art. 70331 - 9,99 € | 5 | ZTP-06 Art. 70442 12,62 € | 1 |
| TP-06 M2×10 Art. 70346 - 9,99 € | | | |
| TP-06 M2×11,5 Art. 70356 - 9,99 € | | | |
| TP-07 M2,5×13 Art. 70359 - 9,99 € | | ZTP-07 Art. 70445 12,62 € | |
| TP-07 M2,5×15 Art. 70362 - 9,99 € | | | |
| TP-09 M3×16 Art. 70364 9,99 € | | ZTP-09 Art. 70448 13,64 € | |
| TP-09 M3×17 Art. 70370 - 9,99 € | | | |
| TP-09 M3×20 Art. 70373 - 9,99 € | | | |
| TP-10 M3,5×22 Art. 70376 - 9,99 € | | ZTP-10 Art. 70454 14,70 € | |
| TP-10 M3,5×24 Art. 70382 - 9,99 € | | | |
| TP-15 M4×26 Art. 70388 - 9,99 € | | ZTP-15 Art. 70457 45,97 € | |
| TP-20 M5×29 Art. 70397 - 9,99 € | | ZTP-20 Art. 70466 45,97 € | |
| TP-20 M5×32 Art. 70425 - 9,99 € | | | |
| TP-25 M6×35 Art. 70434 - 9,99 € | | ZTP-25 Art. 70472 45,97 € | |

## RECOMENDACIONES PLAQUITAS TALADRADO
Drilling Insert Recommendations
Suggestions plaquettes perçage

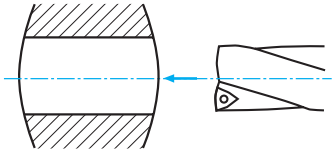
**Agujero Previo**
**Existing Hole -** Trou existant



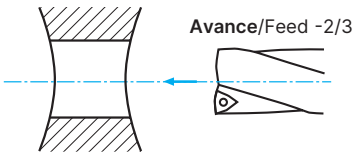

**Entrada en Ángulo**
**Angle Entry -** Entrée en angle



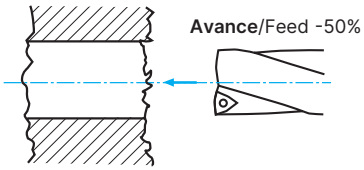

**Superficie Convexa**
**Convex Surface -** Surface convexe



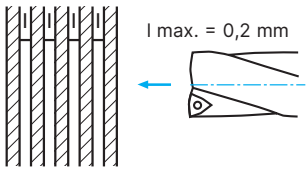
**Superficie Cóncava**
**Concave Surface -** Surface concave




**Superficie Irregular**
**Irregular Surface -** Surface irreguliére




**Material Sandwich**
**Sandwich Material -** Matériel sandwich

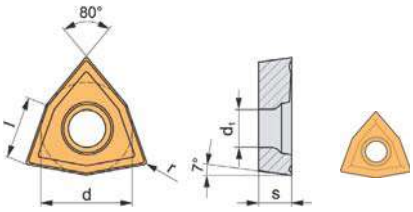



**Avances Plaquitas MD Ref. 8450** **HM Insert Feed** Avance plaquettes carbure **(f=mm/rev.)**

| Material | | Vc (m/min.) MD HM/Carbure | Ø 17-20 | Ø 21-25 | Ø 26-30 | Ø 31-40 | Ø 41-50 | Ø 51-55 |
|---|---|---|---|---|---|---|---|---|
| P | <450 N/mm² | 180-260 | 0,050 | 0,060 | 0,070 | 0,080 | 0,090 | 0,100-0,120 |
| | 400-700 N/mm² | 150-240 | 0,100 | 0,120 | 0,140 | 0,160 | 0,180 | 0,180-0,200 |
| | 500-900 N/mm² | 120-240 | 0,110 | 0,150 | 0,180 | 0,200 | 0,220 | 0,220-0,250 |
| | 900-1200 N/mm² | 130-220 | 0,100 | 0,150 | 0,180 | 0,200 | 0,220 | 0,220-0,250 |
| M | AUSTENÍTICO Austenitic Austénitique | 150-220 | 0,070 | 0,090 | 0,110 | 0,120 | 0,130 | 0,100-0,180 |
| K | | 120-200 | 0,150 | 0,160 | 0,180 | 0,200 | 0,230 | 0,150-0,220 |
| S | | 40-80 | 0,070 | 0,090 | 0,100 | 0,110 | 0,120 | 0,090-0,120 |
| N | | 300-380 | 0,060 | 0,070 | 0,080 | 0,120 | 0,160 | 0,100-0,140 |
| H | HRC 45-60 | | | | | | | |

# Ref. 8450

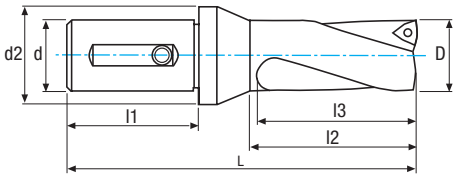
## PLAQUITA INTERCAMBIABLE TALADRADO WCMX
WCMX Drilling Indexable Insert
Plaquette perçage WCMX



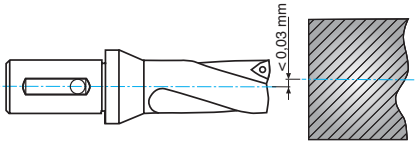

| ISO | l mm | d mm | s mm | r mm | $d_1$ mm | | N° Art. P-620 | € |
|---|---|---|---|---|---|---|---|---|
| WCMX-030208 | 3,46 | 5,56 | 2,38 | 0,80 | 2,60 | 10 | 17667 | 9,46 |
| WCMX-040208 | 3,99 | 6,35 | 2,38 | 0,80 | 2,90 | 10 | 17680 | 9,46 |
| WCMX-050308 | 5,07 | 7,94 | 3,18 | 0,80 | 3,50 | 10 | 17681 | 9,46 |
| WCMX-06T308 | 6,14 | 9,52 | 3,97 | 0,80 | 3,90 | 10 | 17706 | 9,46 |
| WCMX-080412 | 8,14 | 12,70 | 4,76 | 1,20 | 4,50 | 10 | 17708 | 9,46 |

# Ref. 8425

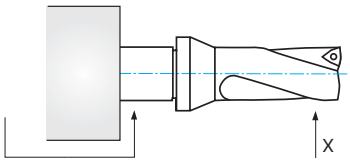
## PORTA-PLAQUITAS TALADRADO ISO 9766 (3XD)
(3XD) ISO 9766 Drilling Tool-Holder
Porte-Plaquettes perçage ISO 9766 (3XD)




**Ejemplo Ajuste Radial**
Radial Adjustment Example
Example fixation rayon

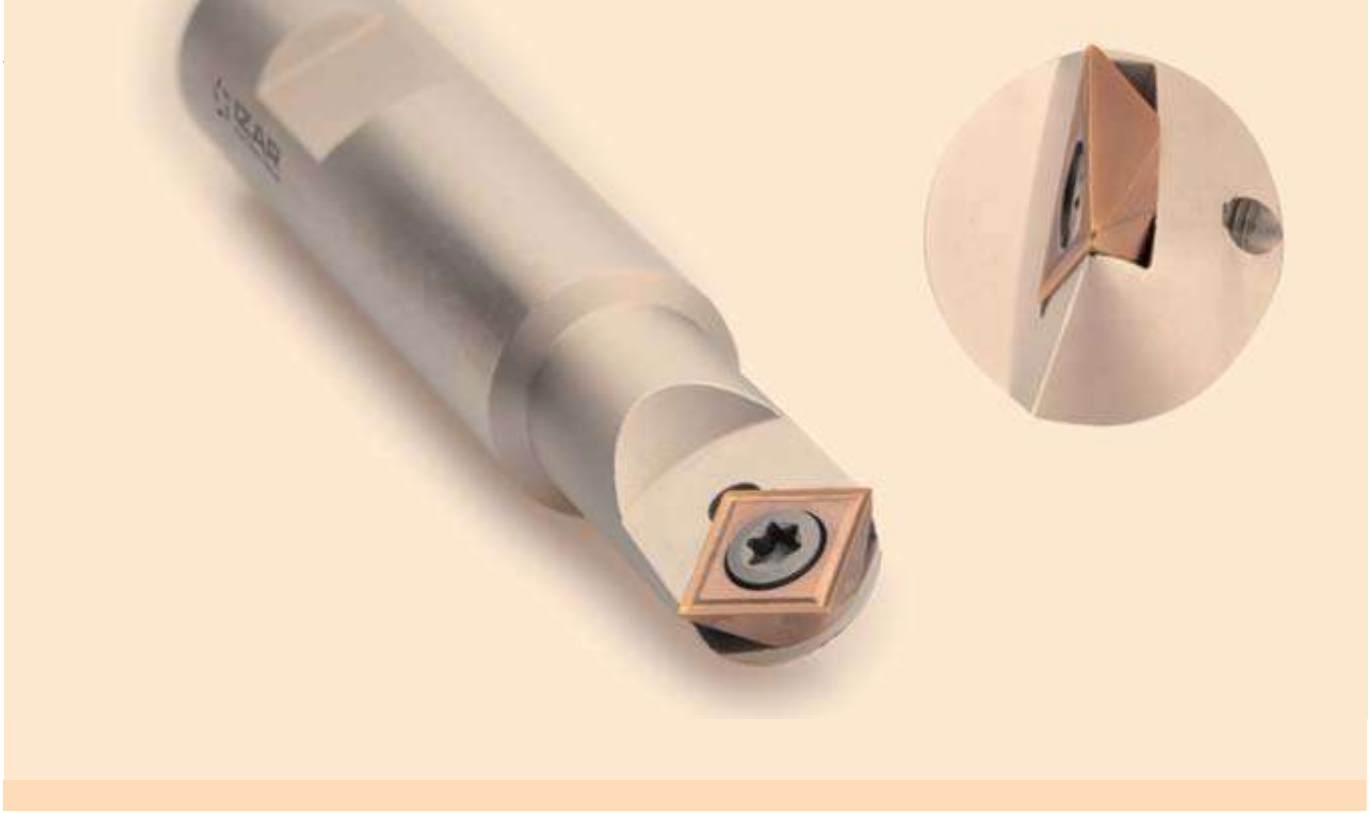



**Refrigerante**
Coolant
Reffroidissant




| D mm | L mm | $l_1$ mm | $l_2$ mm | $l_3$ mm | d mm | $d_2$ mm | Ajuste radial Radial Fit Réglage rayon D max | N° Art. | € |
|---|---|---|---|---|---|---|---|---|---|
| 17,50 | 122 | 50 | 56 | 53 | 25 | 40 | +1,00 → 19,5 | 17385 | 382,19 |
| 18,00 | 123 | 50 | 57 | 54 | 25 | 40 | +0,90 → 19,8 | 17386 | 382,19 |
| 18,50 | 125 | 50 | 59 | 56 | 25 | 40 | +0,85 → 20,2 | 17407 | 382,19 |
| 19,00 | 126 | 50 | 60 | 57 | 25 | 40 | +0,80 → 20,6 | 17444 | 382,19 |
| 20,00 | 131 | 50 | 64 | 60 | 25 | 40 | +0,75 → 21,5 | 17448 | 382,19 |
| 22,00 | 142 | 55 | 69 | 66 | 25 | 40 | +1,25 → 24,5 | 17452 | 382,19 |
| 24,00 | 150 | 55 | 76 | 72 | 25 | 40 | +0,75 → 25,5 | 17453 | 382,19 |
| 25,00 | 154 | 55 | 79 | 75 | 25 | 40 | +0,50 → 26,0 | 17454 | 382,19 |
| 26,00 | 157 | 55 | 81 | 78 | 32 | 50 | +2,50 → 31,0 | 17467 | 457,17 |
| 27,00 | 160 | 55 | 84 | 81 | 32 | 50 | +2,20 → 31,4 | 17476 | 457,17 |
| 28,00 | 164 | 55 | 87 | 84 | 32 | 50 | +2,10 → 32,2 | 17479 | 457,17 |
| 29,00 | 167 | 55 | 90 | 87 | 32 | 50 | +1,80 → 32,6 | 17494 | 457,17 |
| 30,00 | 172 | 55 | 94 | 90 | 32 | 50 | +1,80 → 33,0 | 17587 | 457,17 |
| 31,00 | 181 | 60 | 97 | 93 | 40 | 60 | +3,50 → 38,0 | 17592 | 509,62 |
| 32,00 | 184 | 60 | 100 | 96 | 40 | 60 | +3,20 → 38,4 | 17595 | 509,62 |
| 34,00 | 191 | 60 | 106 | 102 | 40 | 60 | +2,80 → 39,6 | 17596 | 509,62 |
| 35,00 | 195 | 60 | 109 | 105 | 40 | 60 | +2,50 → 40,0 | 17610 | 509,62 |
| 38,00 | 206 | 60 | 118 | 114 | 40 | 60 | +1,80 → 41,0 | 17614 | 577,55 |
| 39,00 | 209 | 60 | 121 | 117 | 40 | 60 | +1,50 → 41,6 | 17625 | 577,55 |
| 40,00 | 213 | 60 | 124 | 120 | 40 | 60 | +1,20 → 42,0 | 17631 | 577,55 |
| 42,00 | 225 | 65 | 130 | 126 | 40 | 60 | +4,20 → 51,0 | 17634 | 587,46 |
| 43,00 | 229 | 65 | 133 | 129 | 40 | 60 | +4,00 → 51,4 | 17643 | 587,46 |
| 45,00 | 237 | 65 | 140 | 135 | 40 | 60 | +3,60 → 52,2 | 17650 | 587,46 |
| 48,00 | 248 | 65 | 149 | 144 | 40 | 60 | +2,70 → 53,4 | 17652 | 587,46 |
| 49,00 | 251 | 65 | 152 | 147 | 40 | 60 | +2,50 → 54,0 | 17655 | 650,47 |
| 50,00 | 255 | 65 | 155 | 150 | 40 | 60 | +2,20 → 54,4 | 17658 | 650,47 |
| 52,00 | 262 | 65 | 161 | 156 | 40 | 60 | +1,80 → 55,6 | 17660 | 650,47 |
| 54,00 | 269 | 65 | 167 | 162 | 40 | 60 | +1,20 → 56,4 | 17661 | 650,47 |
| 55,00 | 274 | 65 | 171 | 165 | 40 | 60 | +0,80 → 56,6 | 17664 | 650,47 |

| Plaquita Insert Plaquette | Ref. 8805 | Ref. 8801 |
|---|---|---|
| | | |
| WCMX 030208 | T-03 Ref. 8805 Art. 19572 **5,59 €** (1) | ZT-07 Ref. 8801 Art. 19569 **11,06 €** (1) |
| WCMX 040208 | T-04 Ref. 8805 Art. 19573 **3,70 €** (5) | ZT-08 Ref. 8801 Art. 10506 **11,06 €** (1) |
| WCMX 050308 | ZM-4 Ref. 8816 Art. 10544 **1,84 €** (5) | ZT-09 Ref. 8801 Art. 13707 **11,06 €** (1) |
| WCMX 06T308 | T-06 Ref. 8805 Art. 19576 **3,70 €** (5) | ZT-10 Ref. 8801 Art. 19570 **11,06 €** (1) |
| WCMX 080412 | T-08 Ref. 8805 Art. 19579 **3,70 €** (5) | ZT-15 Ref. 8801 Art. 10512 **11,06 €** (1) |



## AVANCES PLAQUITAS MD TALADRADO
Drilling HM Inserts Feed
Avance plaquettes carbure perçage

# Refs. 8465-8470-8475-8460-8431

**Punteado**
**Spotting**
Pointillage

| Material | | 90° | | | |
|---|---|---|---|---|---|
| | | Vc (m/min.) | | f(mm/rev.) | |
| | | Ø2 - Ø4,9 | Ø >4,9 | Ø2 - Ø4,9 | Ø >4,9 |
| P | P.1 | 80-120 | 90-220 | 0,04-0,08 | 0,06-0,1 |
| | P.2 | 70-100 | 80-180 | 0,04-0,08 | 0,06-0,1 |
| | P.3 | 60-90 | 70-150 | 0,03-0,06 | 0,05-0,08 |
| | P.5 | 50-70 | 70-130 | 0,03-0,06 | 0,05-0,08 |
| M | | 30-60 | 50-120 | 0,02-0,04 | 0,04-0,06 |
| K | | 80-110 | 100-150 | 0,04-0,06 | 0,06-0,01 |
| N | | | | | |
| H | | 20-40 | 30-60 | 0,02-0,04 | 0,04-0,08 |

**Achaflanado/Avellanado**
**Chamfering/Countersinking**
Chanfreins longitudinaux/ Chanfreinage

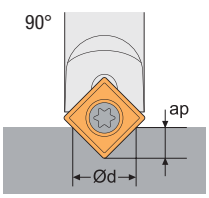
| Material | | 90° | | 60° | |
|---|---|---|---|---|---|
| | | Vc (m/min.) | f(mm/rev.) | Vc (m/min.) | f(mm/rev.) |
| P | P.1 | 80-270 | 0,15-0,24 | 12-180 | 0,05-0,15 |
| | P.2 | 70-220 | 0,15-0,24 | 12-180 | 0,05-0,15 |
| | P.3 | 60-160 | 0,12-0,2 | 12-180 | 0,03-0,12 |
| | P.5 | 50-140 | 0,12-0,2 | 12-180 | 0,05-0,15 |
| M | | 40-120 | 0,1-0,2 | 12-180 | 0,05-0,15 |
| K | | 80-220 | 0,15-0,25 | 12-180 | 0,05-0,15 |
| N | | | | 12-180 | 0,1-0,2 |
| H | | 20-60 | 0,03-0,08 | 12-180 | 0,03-0,1 |

**Ranurado**
**Grooving**
Rainurage

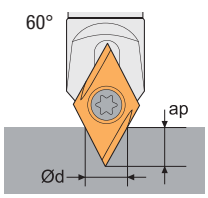
| Material | | 90° | | 60° | |
|---|---|---|---|---|---|
| | | Vc (m/min.) | f(mm/rev.) | Vc (m/min.) | f(mm/rev.) |
| P | P.1 | 60-140 | 0,12-0,18 | 10-170 | 0,005-0,05 |
| | P.2 | 70-100 | 0,04-0,08 | 10-170 | 0,005-0,05 |
| | P.3 | 60-90 | 0,03-0,06 | 10-170 | 0,005-0,03 |
| | P.5 | 50-70 | 0,03-0,06 | 10-170 | 0,005-0,03 |
| M | | 30-60 | 0,02-0,04 | 10-170 | 0,005-0,05 |
| K | | 80-110 | 0,04-0,06 | 10-170 | 0,005-0,03 |
| N | | | | 10-170 | 0,005-0,08 |
| H | | 20-40 | 0,02-0,04 | 10-170 | 0,005-0,02 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

$$Vf\ (mm/min.) = r.p.m. \times f$$



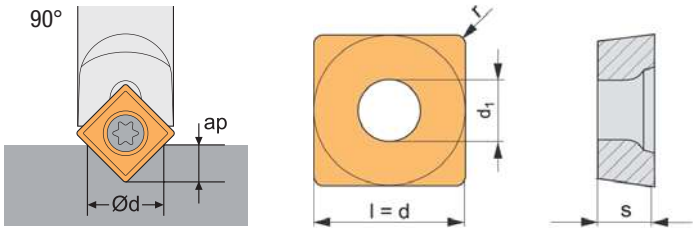

Ød = (ap + 0.3) × 2




Ød = [(0,577xap)+(0,5xr)]x2

# Ref. 8465

## PLAQUITA INTERCAMBIABLE PUNTEADO SOGX
SOGX Spotting Indexable Insert
Plaquette de repérage SOGX



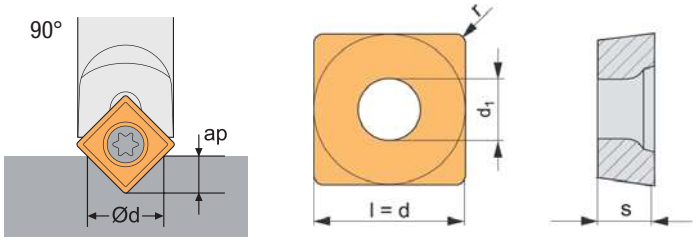

| | ISO | Dimensiones Dimensions l mm | d mm | s mm | r mm | Ød Punteado Spotting Pointillage | Grabado Engraving Gravure | | N° Art. P-010 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Aluminio / Aluminium /** Aluminium | | | | | | | | | |
| | **SOGX-09T304-ZAL** | 9,52 | 9,52 | 3,97 | 0,40 | 2-11 | 0,8-2,5 | 10 | 82213 | **25,03** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8465 SOGX-09T304-ZAL P-010**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 519**

# Ref. 8470

## PLAQUITA INTERCAMBIABLE PUNTEADO SOMX
SOMX Spotting Indexable Insert
Plaquette de repérage SOMX



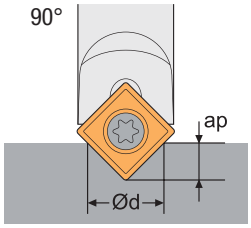

| | ISO | Dimensiones Dimensions l mm | d mm | s mm | r mm | Ød Punteado Spotting Pointillage | Grabado Engraving Gravure | | N° Art. P-730 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| | **INOX / Stainless /** INOX | | | | | | | | | |
| | **SOMX-09T304-ZMS** | 9,52 | 9,52 | 3,97 | 0,40 | 2-11 | 0,8-2,5 | 10 | 82214 | **20,86** |
| | **Acabado / Finishing /** Finition | | | | | | | | | |
| | **SOMX-09T304-ZMF** | 9,52 | 9,52 | 3,97 | 0,40 | 2-11 | 0,8-2,5 | 10 | 82215 | **20,86** |

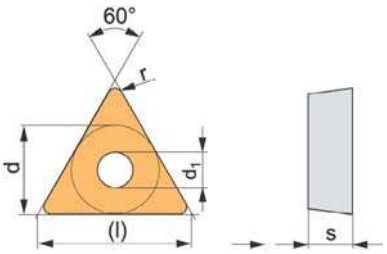
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8470 SOMX-09T304-ZMS P-730**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 519**

# Ref. 8475

## PLAQUITA INTERCAMBIABLE PUNTEADO TOMX
TOMX Spotting Indexable Insert
Plaquette de repérage TOMX



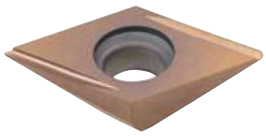

| ISO | Dimensiones Dimensions l mm | d mm | s mm | r mm | Ød Punteado Spotting Pointillage | Ød Grabado Engraving Gravure | | N° Art. P-730 | € |
|---|---|---|---|---|---|---|---|---|---|
| **Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | |
| **TOMX-16T308-ZM** | 16,5 | 9,52 | 3,97 | 0,8 | 3-20 | 1,5-4 | 10 | 82216 | **20,86** |

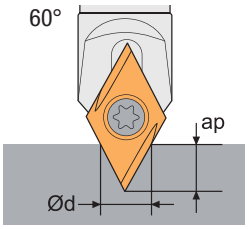
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8475 TOMX-16T308-ZM P-730**

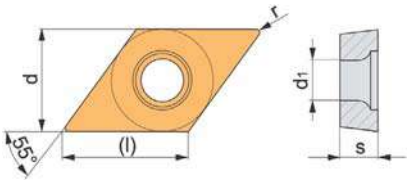
**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 519**

# Ref. 8460

## PLAQUITA INTERCAMBIABLE PUNTEADO DOEX
DOEX Spotting Indexable Insert
Plaquette de repérage DOEX





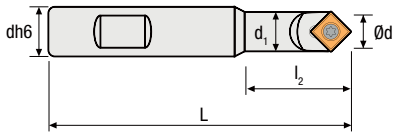

| ISO | Dimensiones Dimensions l mm | d mm | s mm | r mm | Ød Punteado Spotting Pointillage | Ød Grabado Engraving Gravure | | N° Art. P-730 | € |
|---|---|---|---|---|---|---|---|---|---|
| **Acabado / Finishing /** Finition | | | | | | | | | |
| **DOEX-11T301-ER-ZSX** | 11,6 | 9,52 | 3,97 | 0,1 | 0,2-6,8 | 0,2-1 | 10 | 82208 | **45,87** |
| **DOEX-11T302-ER-ZSX** | 11,6 | 9,52 | 3,97 | 0,2 | 0,4-6,8 | 0,4-2 | 10 | 82209 | **32,78** |
| **DOEX-11T304-ER-ZSX** | 11,6 | 9,52 | 3,97 | 0,4 | 0,8-6,8 | 0,8-3 | 10 | 82210 | **32,78** |
| **Desbaste / Roughing /** Ébauche | | | | | | | | | |
| **DOEX-11T304-ER-ZR** | 11,6 | 9,52 | 3,97 | 0,4 | 0,8-6,8 | 0,8-3 | 10 | 82211 | **32,78** |
| **DOEX-11T308-ER-ZR** | 11,6 | 9,52 | 3,97 | 0,8 | 0,8-6,8 | 0,8-3 | 10 | 82212 | **32,78** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8460 DOEX-11T301-ER-ZSX P-730**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 520**

# Ref. 8431

## PORTA-PLAQUITAS PUNTEADO SPS.. 90°
SPS.. 90° Spotting Tool-Holder
Porte-plaquettes de repérage SPS.. 90°




| ISO | | dh6 mm | $d_1$ mm | L mm | $l_2$ mm | N° Art. | € | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SPS10H-N09-90 | SOGX09 / SOMX09 | 10 | 12,2 | 100 | 29 | 82219 | 98,25 | T-15-M3,5-7x 3,5xø5,5 Art. 83387 3,42 € | 5 | ZT-15 Art. 10512 11,06 € | 1 |
| SPS12H-N09-90 | | 12 | 12,2 | 100 | 29 | 82220 | 98,25 | | | | |
| SPS16H-N09-90 | | 16 | 12,2 | 100 | 29 | 82221 | 104,40 | | | | |
| SPS16L 130-N09-90 | | 16 | 12,2 | 130 | 29 | 82222 | 108,56 | | | | |

Tornillo / Screw / Vis
Destornillador / Screwdriver / Tournevis

**Plaquita** / Insert / Plaquette: **Pag. 517**

### Set 3 Pcs

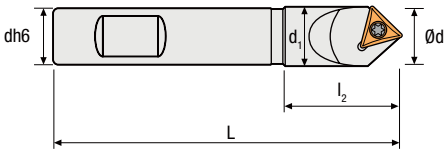
| | Cont. | | N° Art. | € |
|---|---|---|---|---|
| 1 | Ref. 8431 - Art. 82220 - SPS12H-N09-90 (1pc) + Ref. 8470 - Art. 82215 - SOMX-09T304-ZMF (4pcs) + **Destornillador**-Screwdriver-Tournevis - **T-15** (1pc) | | 82224 | **172,57** |

### Set 3 Pcs

| | Cont. | | N° Art. | € |
|---|---|---|---|---|
| 2 | Ref. 8431 - Art. 82221 - SPS16H-N09-90 (1pc) + Ref. 8470 - Art. 82215 - SOMX-09T304-ZMF (4pcs) + **Destornillador**-Screwdriver-Tournevis - **T-15** (1pc) | | 82225 | **178,41** |

# Ref. 8432

## PORTA-PLAQUITAS PUNTEADO SPS.. 90°
SPS.. 90° Spotting Tool-Holder
Porte-plaquettes de repérage SPS.. 90°




| ISO | | dh6 mm | $d_1$ mm | L mm | $l_2$ mm | N° Art. | € | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SPS20L 120-N09-90 | TOMX16.. | 20 | 21,2 | 120 | 42 | 82223 | 177,77 | T-15-M3,5-8x 5xø5,3 Art. 83388 3,42 € | 5 | ZT-15 Art. 10512 11,06 € | 1 |

Tornillo / Screw / Vis
Destornillador / Screwdriver / Tournevis

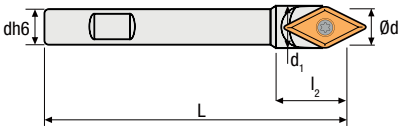
**Plaquita** / Insert / Plaquette: **Pag. 518**

### Set 3 Pcs

| Cont. | | N° Art. | € |
|---|---|---|---|
| Ref. 8432 - Art. 82223 - SPS20L 120-N09-90 (1pc) + Ref. 8475 -Art. 82216 - TOMX-16T308-ZM (4pcs) + **Destornillador**-Screwdriver-Tournevis - **T-15** (1pc) | | 82207 | **248,12** |

# Ref. 8430

**PORTA-PLAQUITAS PUNTEADO SPS.. 60°**
SPS.. 60° Spotting Tool-Holder
Porte-plaquettes de repérage SPS.. 60°




| ISO | | dh6 mm | $d_1$ mm | L mm | $l_2$ mm | N° Art. | € | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SPS10D-N11-60 | DOEX-11.. | 10 | 12 | 60 | 30 | 82217 | 94,15 | T-15-M3,5-7x 5xø5,5 Art. 83387 3,42 € | 5 | ZT-15 Art. 10512 11,06 € | 1 |
| SPS12H-N11-60 | | 12 | 12 | 100 | - | 82218 | 98,25 | | | | |

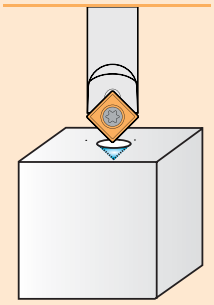
**Tornillo**
Screw
Vis

**Destornillador**
Screwdriver
Tournevis

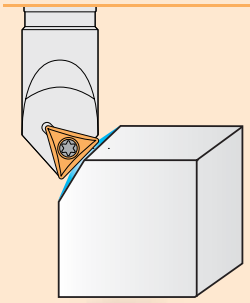
**Plaquita** / Insert / Plaquette: **Pag. 518**

## APLICACIONES REFS. 8430 - 8431 - 8432
Applications refs. 8430 - 8431 - 8432
Applications refs. 8430 - 8431 - 8432

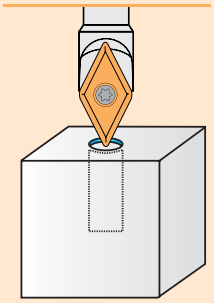
**Punteado**
Spotting
Pointillage



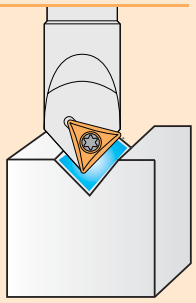
**Achaflanado**
Chamfering
Chanfreins longitudinaux



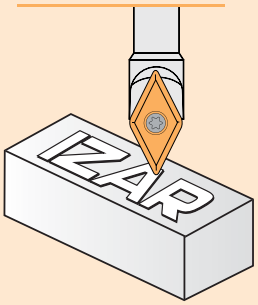
**Avellanado**
Countersinking
Chanfreinage



**Ranurado**
Grooving
Rainurage

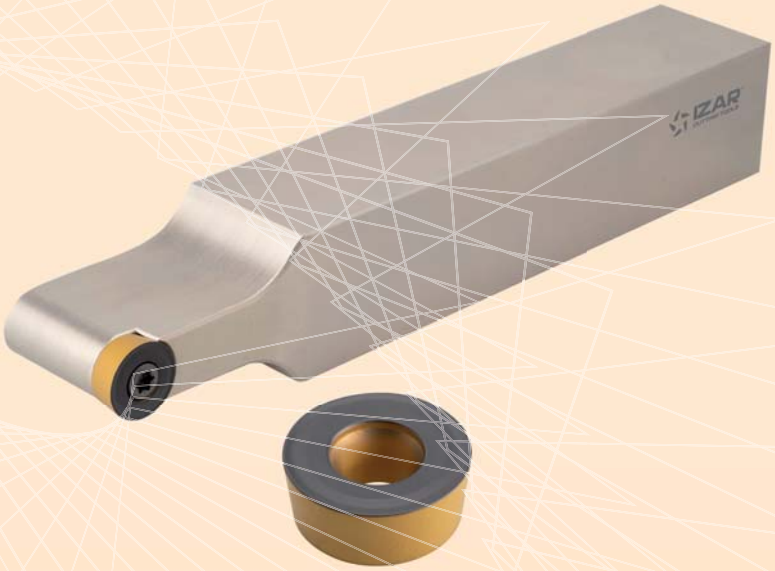


**Grabado**
Engraving
Gravure



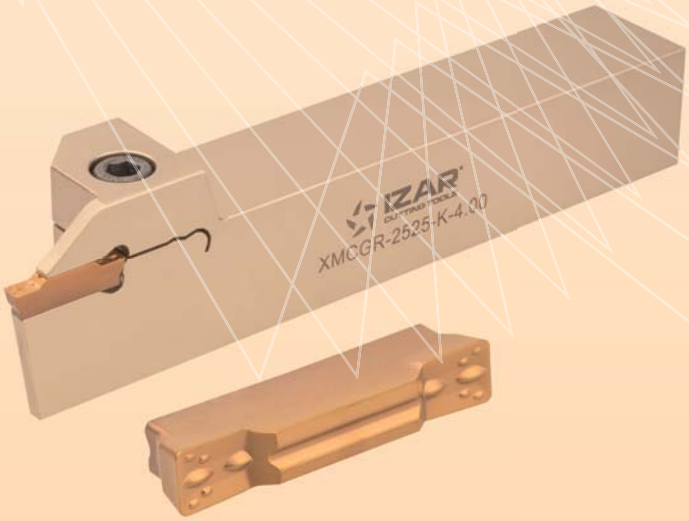
## TORNEADO
Turning
Tournage

Pag. 530



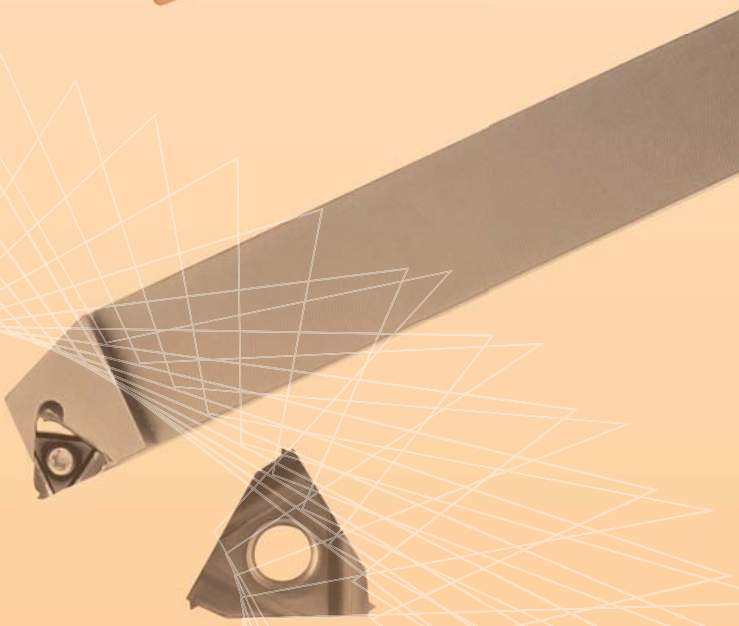

## TRONZADO Y RANURADO
Parting & Grooving
Tonçonnage et rainurage

Pag. 572




## ROSCADO
Threading
Taraudage

Pag. 584



# TORNEADO
Turning
Tournage

**GRADOS RECUBRIMIENTO MÉTODOS CVD-PVD TORNEADO**
Turning CVD-PVD Methods Coating Grades
Degré revêtement méthodes CVD-PVD tournage

## NUEVOS GRADOS PVD - PVD NEW GRADES - NOUVEAUX DEGRÉS PVD

**M**
**Inox**
Stainless Steel
Inox

**S**
**Resistencia al desgaste**
**Wear Resistance**
Résistant à l'usure

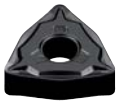
**Algunos grados**
**Some grades**
Quelques degrés

**P-6..**
**P-7..**

**serán reemplazados por**
**will be replaced by**
seront remplacés pour

> **P-H..**

**Grado actual**
**Current grade**
Degré actuel



**Nuevo Grado**
**New Grade**
Nouveau degré

## NUEVOS GRADOS CVD - CVD NEW GRADES - NOUVEAUX DEGRÉS CVD

**P**
**Acero**
**Steel**
Acier

**C-5..** > **C-G..**

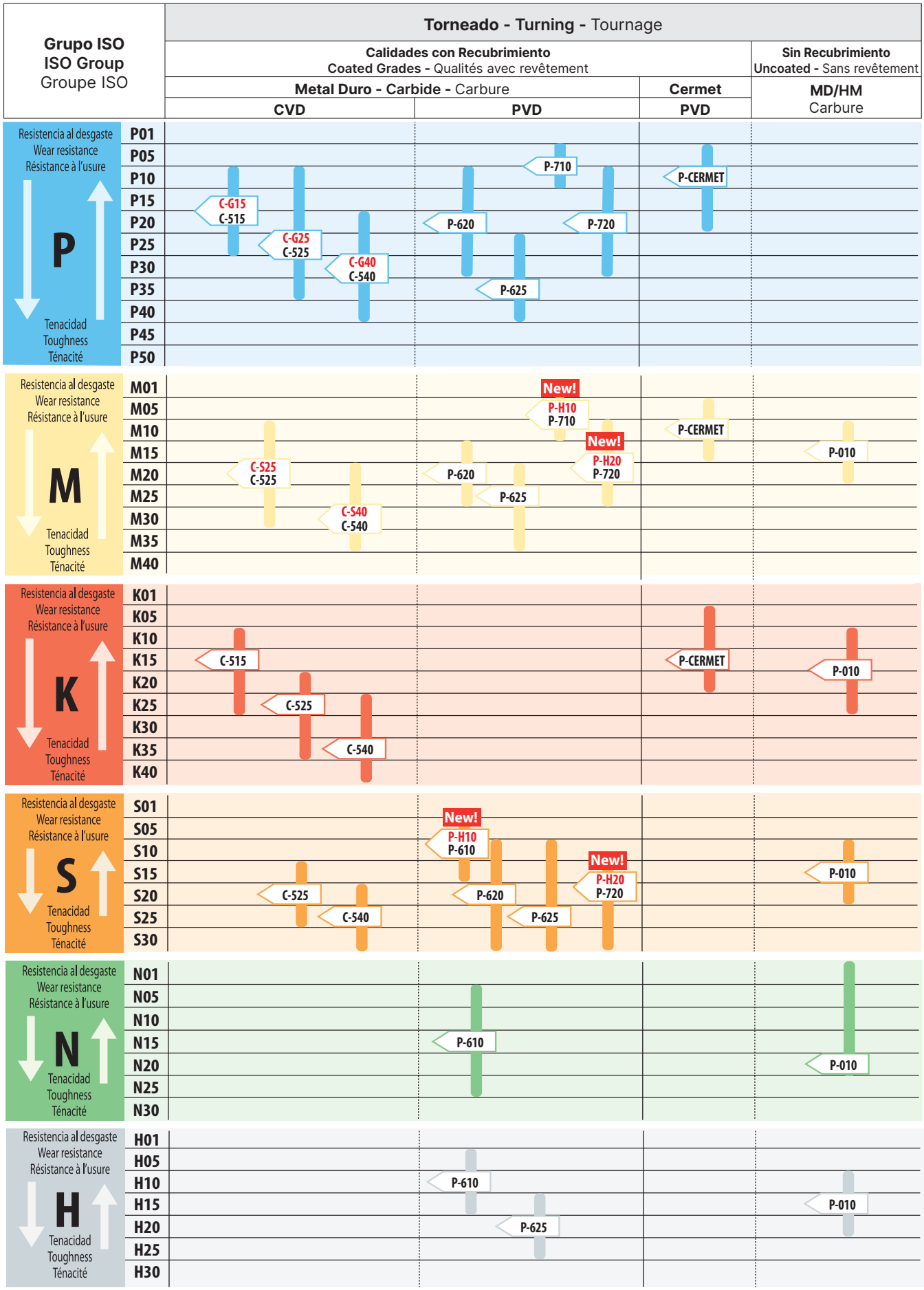
**Nuevo Grado**
**New Grade**
Nouveau degré

**M**
**Inox**
Stainless Steel
Inox

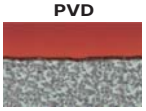
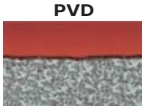
**C-5..** > **C-S..**

**Nuevo Grado**
**New Grade**
Nouveau degré

# CLASIFICACIÓN CALIDADES - ELECCIÓN PRINCIPAL TORNEADO
## Turning Grade Classification - Main Choice
## Classement des qualités - Choix principal tournage

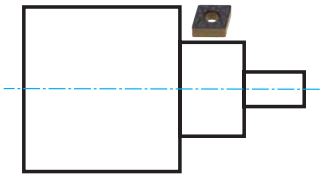


# GRADOS RECUBRIMIENTO MÉTODOS CVD-PVD TORNEADO
Turning CVD-PVD Methods Coating Grades
Degré revêtement méthodes CVD-PVD tournage

| Grado Grades Degré | Microestructura Microestructure Microstructure | Grupo Material Pieza Trabajo Workpiece Material Group Groupe materiel piece travail | Aplicación Recomendada Recommended Application Application conseillée | | |
|---|---|---|---|---|---|
| C-515<br>C-G15 | CVD | P M K S N H<br>● ● ● | - Sustrato de bajo contenido en cobalto<br>- Recubrimiento de doble capa, con capa principal de TICN, aplicadas por metodos MTCVD y PVD con capas $Al_2O_3$<br>- Para materiales del grupo P-K<br>- Elevadas velocidades de corte en condiciones estables y moderadamente interrumpidas | - Substrate with low content of cobalt<br>- Double layered coating, with TICN main layer, applied by MTCVD & PVD methods with layers $Al_2O_3$<br>- For materials of groups P-K<br>- High cutting speed in stable conditions and moderate interrupted cut | - Substrat de faible contenu de cobalt<br>- Revêtement double couche, couche principale en TICN, apliquées pour méthodes MTCVD et PVD avec couches $Al_2O_3$<br>- Pour Matériaux groupe P-K<br>- Hautes Vc en conditions stables et faiblement intérrompues |
| C-525<br>C-G25 | CVD | P M K S N H<br>● ● ● ○ | - Sustrato versatil y funcional para trabajar en materiales P-M-K<br>- Nuevo recubrimiento por metodo MTCVD de media capa<br>- Pulido después del recubrimiento<br>- Medias y altas velocidades de corte en cortes continuos e interrumpidos | - Versatile & functional substrate for working materials P-M-K<br>- New medium-thick coating applied by MTCVD method<br>- Adjustment after coating<br>- Medium & high Vc in continuous & interrupted cut | - Substrat mutifonction pour travailler en matériaux P-M-K<br>- Nouveau revêtement pour méthode MTCVD de couche moyenne<br>- Polissage après revêtement<br>- Moyennes et Hautes Vc sur coupes continues et intérrrompues |
| C-540<br>C-G40 | CVD | P M K S N H<br>● ● ● ○ | - Sustrato de micrograno con carburos<br>- Recubrimiento fino por metodo MTCVD con capa principal de TICN<br>- Aplicación en desbaste y semi-desbaste en materiales del grupo P-M<br>- Condiciones de corte bajas en cortes interrumpidos | - Submicron substrate with carbides<br>- Thin MTCVD applied coating with main layer of TICN<br>- For roughing and semi-roughing in materials of groups P-M<br>- Low cutting conditions and interrupted cut | - Substrat micrograins avec carbures<br>- Revêtement fin par méthode MTCVD avec couche principale en TICN<br>- Application en ébauche et semi-ébauche en matériaux P-M<br>- Faibles conditions de coupe en coupes interrompues |
| P-010 | Sin rec.<br>No coat.<br>Sans rev. | P M K N<br>○ ● ○ ● ○ | - Sustrato de submicrograno sin carburos y bajo contenido en cobalto<br>- Aplicación general para todos los grupos de materiales menos el P<br>- Sección de viruta corta en condiciones estables | - Submicron substrate without carbides and low cobalt content<br>- General purpose for all material groups but P<br>- Small chip cross-section in stable conditions | - Substrat submicrograin avec faible contenu en cobalt<br>- Application générale pour tous les groupes de matériaux moins le P<br>- Section de copeaux courts en conditions stables |
| P-620 | PVD | P M K S N H<br>● ● ● | - Sustrato de micrograno de elevada resistencia al desgaste, con bajo contenido en cobalto y con carburos<br>- Nanorecubrimiento por metodo PVD<br>- Recomendada para aplicaciones generales con gran estrés térmico<br>- Secciones de viruta corta en elevadas condiciones de corte<br>- Condiciones de corte estables | - Submicron substrate with high wear resistance, with low content of cobalt and carbides<br>- Nanostructural coating applied by PVD method<br>- Recommended for general purpose with high thermal stress<br>- Small chip cross-section and high cutting conditions<br>- Stable working conditions | - Substrat micrograin d´haute résistance à l´usure , avec faible contenu en cobalt et avec carbures<br>- Nanorevêtement par méthode PVD<br>- Conseillé pour applications générales avec gran stress thérmique<br>- Conditions de coupe stables |
| P-625 | PVD | P M K S N H<br>● ● ● | - Sustrato de micrograno<br>- Nanorecubrimiento por metodo PVD<br>- Velocidades de corte moderadas<br>- Condiciones de corte menos favorables | - Submicron substrate<br>- Nanostructural coating applied by PVD method<br>- Moderate cutting speed<br>- Less favourable cutting conditions | - Substrat micrograin<br>- Nanorevêtement par méthode PVD<br>- Vitesses de coupe modérées<br>- Conditions de coupe moins favorables |
| P-710<br>P-H10 | PVD | P M K S N H<br>● ● ○ ● ○ ○ | - Grado PVD de metal duro recubierto (AlTiN) con substrato micrograno muy duro, que mejora la resitencia al desgaste, la disipación del calor y evita el filo de aportación. Gran rendimiento en materiales viscosos. Para torneado ligero de aceros, aceros endurecidos, inoxidables y superraleaciones termorresistentes (HRSA). | - PVD (AlTiN) coated carbide grade with a very hard micro grain substrate improves wear resistance, heat dissipation and avoid built-up edge. High performance on "gummy" materials. For light turning of steels, hardened steels, stainless steels and HRSA. | - Degré PVD de carbure avec AlTiN et un substrat en micrograin très dur, qui améliore la résistance à l'usure, la dissipation thermique et évite le filet avec matériel. Haut rendement dans les matériaux visqueux. Pour le tournage léger des aciers, aciers trempés, aciers inoxydables et superalliages résistants à la chaleur (HRSA). |
| P-720<br>P-H20 | PVD  | P M K S N H<br>● ● ● | - Sustrato micrograno combinado con recubrimiento ALTIN-PVD<br>- Operaciones de desbaste y acabado en buenas condiciones de corte y ligeramente interrumpido en aceros INOX y HRSA | - Submicron substrate combined with ALTIN-PVD coating<br>- Roughing & Finishing operations with good cutting conditions and barely interrupted in Stainless & HRSA steels | - Substrat Micrograin mélangé avec revêtement ALTIN-PVD<br>- Ébauche et finition avec bonnes conditions de coupe et légèrement coupé en aciers INOX et HRSA |
| P-CERMET | PVD  | P M K S N H<br>● ● ○ | - Sustrato de micrograno con bajo contenido en cobalto combinado con recubrimiento PVD<br>- Aplicaciones en los grupos de materiales P-M<br>- Pequeñas secciones de viruta<br>- Elevadas velocidades de corte en condiciones estables | - Micron substrate with low cobalt content combined with PVD coating<br>- For material groups P-M<br>- Small chip cross-section<br>- High cutting speed in stable conditions | - Substrat micrograin avec faible contenu en cobalt mélangé avec revêtement PVD<br>- Applications pour groupes de matériaux P-M<br>- Petites sections de copeaux<br>- Hautes vitesses de coupe en conditions stables |

# CRITERIOS ELECCIÓN PLAQUITAS TORNEADO
Turning Insert Choice Norms
Critéres choix plaquettes tournage

## IDENTIFICAR TIPO DE MECANIZADO
**Identify Machining Type**
Identifier type d´usinage

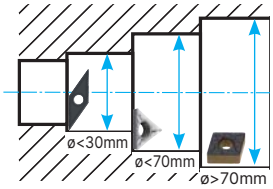


**Exterior / External /** Extérieur

**1ª Rompevirutas Wiper: doble avance y mejor acabado.**
**2ª Plaquitas positivas: Mecanizado inestable y piezas largas.**
**3ª Plaquitas negativas: Piezas estables.**

**1st Wiper:** Double feed & better surface finishing.
**2nd Positive inserts:** Unstable machining & long pieces.
**3rd Negative inserts**: Stable pcs.

**1. Brisecopeaux Wiper:** Double avance et meilleure finition
**2. Plaquettes Positives:** Usinage Inéstable et pieces longues
**3. Plaquettes négatives:** Pièces stables




**Interior / Internal /** Intérieur

**1ª Plaquitas positivas: ø pequeños + gran voladizo.**
**2ª Plaquitas negativas: ø grandes y estables.**

**1st Positive inserts:** small ø-s with big projected piece length.
**2nd Negative inserts:** Big & stable ø-s

**1. Plaquettes Positives:** Petit ø-s + grand saillant
**2. Plaquettes négatives:** Grand et stable ø-s

## ELECCIÓN GEOMETRÍA PLAQUITAS
**Insert Geometry Choice**
Coix taille Plaquette

| Criterio Elección<br>Criterion Choice<br>Critére choix | Prioridad Elección<br>Choice Priority / Priorité choix | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Filos Corte Utilizables<br>Utilizable Cutting Edges<br>Aretes de coupe a utiliser | | | | | | | |
| Estabilidad Corte Interrumpido<br>Interrupted Cut Stability<br>Stabilité coupe interrompue | | | | | | | |
| Accesibilidad<br>Accesibility<br>Accessibilité | | | | | | | |
| Resistencia Deformación Plástica<br>Plastic Deformation Resistance<br>Plastic deformation resistance | | | | | | | |

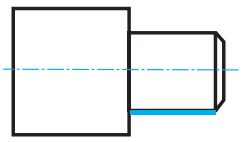
| Exterior<br>External<br>Extérieur | | | | | | | |
|---|---|---|---|---|---|---|---|
| | ● | ○ | ○ | ○ | ○ | | ○ |
| | ○ | ○ | ● | ○ | ○ | | ○ |
| | | ● | | ○ | | ● | ○ |

● **Recomendado** **Recommended** ○ **Posible** **Possible**

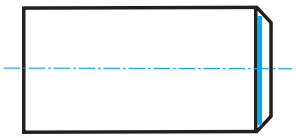
| Interior<br>Internal<br>Intérieur | | | | | | |
|---|---|---|---|---|---|---|
| | ○ | ○ | ○ | ● | ○ | |
| | ● | ○ | | ○ | ○ | |
| | | ● | | ○ | | ● |

## IDENTIFICAR TIPO DE OPERACIÓN
**Identify Operation Type**
Identifier type d´opération

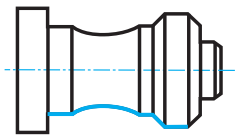
**Exterior - External -** Extérieur



**Torneado Longitudinal**
**Longitudinal Turning**
Tournage longitudinal

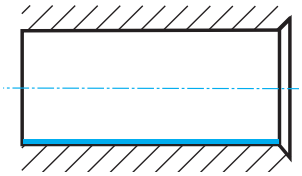


**Refrentado**
**Facing**
Façage

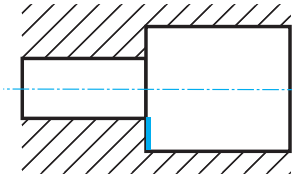


**Perfilado**
**Profiling**
Profilage

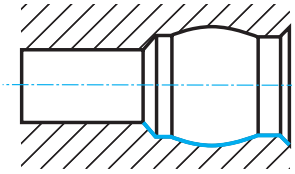
**Interior - Internal -** Intérieur



**Torneado Longitudinal**
**Longitudinal Turning**
Tournage longitudinal

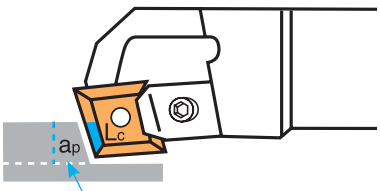


**Refrentado**
**Facing**
Façage



**Perfilado**
**Profiling**
Profilage

## ELECCIÓN TAMAÑO PLAQUITA
**Insert Size Choice**
Choix taille Plaquette




**$a_p$= Profundidad corte** Cutting depth Proffondeur coupe

**$L_c$= Arista corte efectiva** Effective cutting edge Arete coupe qui travaille

Determinar la **Profundidad de Corte más grande ($a_p$)** a tornear para la elección del tamaño de la plaquita.

Decide on the **biggest Cutting Depth ($a_p$)** for turning in order to select the insert size.

Determiner la **Proffondeur de coupe plus grande ($a_p$)** a tourner pour le choix de la taille de la plaquette

| FORMA PLAQ.<br>Insert Shape<br>Forme plaq. | Acabado Fino<br>Fine Finishing<br>Finition fine | Acabado<br>Finishing<br>Finition | Semi Desbaste<br>Semi-Roughing<br>Semi-Ébauche | Desbaste<br>Roughing<br>Ébauche |
|---|---|---|---|---|
| | ap=0,2-1mm | ap=0,8-2 mm | ap=2-4 mm | ap=4-10 mm |
| C... 80° | 06.... | 06.... | 12.... | 16.... |
| | | 09.... | | 19.... |
| D... 55° | 07.... | 07.... | 11.... | |
| | | | 15.... | |
| S... | 09.... | 09.... | 12.... | 15.... |
| | | | | 19.... |
| T... 60° | 11.... | 11.... | 16.... | 22.... |
| | | 16.... | | |
| W... 80° | 06.... | 06.... | 08.... | |
| | | 08.... | | |
| V... 35° | 11.... | 11.... | 16.... | |
| | | | | |
| K... 55° | 16.... | 16.... | 16.... | |
| | | | | |

# CONDICIONES CORTE* CALIDADES TORNEADO
Turning Qualities Cutting Conditions*
Conditions coupe* qualités tournage

***Para vida herramienta de 15 min. sin refrigerante / *For 15 min. tool life without coolant / ***Pour vie outil 15 min. sans réfrigération

| Calidad Quality Qualité | P | | | |
|---|---|---|---|---|
| | f (mm) | | Factor K- Corrige Vc en función de K Factor- Correct Vc depending on Facteur K- Vc correct à cause de | |
| C-515 | 0,2 0,4 0,8 | 350-220 270-205 220-200 | **Forjados/fundidos carcasa Forging/melting w. frame** Forgeage/fondu carcasse | K = 0,70-0,80 |
| C-525 | 0,2 0,4 0,8 | 295-215 240-185 215-170 | **Torneado interior Internal turning** Tournage intérieur | K = 0,75-0,85 |
| C-540 | 0,2 0,4 0,8 | 250-210 220-180 210-175 | **Corte interrumpido Interrupted cut** Coupe interrompue | K = 0,80-0,90 |
| P-620 | 0,2 0,4 0,8 | 225-215 230-210 210-210 | **Maq. en buen estado Good condition mach.** Mach. en bon état | K = 1,05-1,20 |
| P-625 | 0,2 0,4 0,8 | 230-220 220-210 200-200 | **Maq. en mal estado Bad condition mach.** Mach. en mauvais état | K = 0,85-0,95 |
| P-720 | 0,2 0,4 0,8 | 230-125 220-115 210-100 | **Vida plaquita Insert life** Vie plaquette | $T_{min}$ 10 K = 1,10<br>$T_{min}$ 15 K = 1,00<br>$T_{min}$ 20 K = 0,93<br>$T_{min}$ 30 K = 0,84<br>$T_{min}$ 45 K = 0,76<br>$T_{min}$ 60 K = 0,71 |
| P-Cermet | 0,2 0,4 0,8 | 390-250 | | |
| P-010 | 0,2 0,4 0,8 | | | |

| Calidad Quality Qualité | M | | | |
|---|---|---|---|---|
| | f (mm) | | Factor K- Corrige Vc en función de K Factor- Correct Vc depending on Facteur K- Vc correct à cause de | |
| C-515 | 0,2 0,4 0,6 | 260-230 220-185 200-145 | **Forjados/fundidos carcasa Forging/melting w. frame** Forgeage/fondu carcasse | K = 0,70-0,80 |
| C-525 | 0,2 0,4 0,6 | 230-190 175-150 135-110 | **Torneado interior Internal turning** Tournage intérieur | K = 0,75-0,85 |
| C-540 | 0,2 0,4 0,6 | 180-160 160-135 135-105 | **Corte interrumpido Interrupted cut** Coupe interrompue | K = 0,80-0,90 |
| P-620 | 0,2 0,4 0,6 | 310-260 255-205 200-155 | **Maq. en buen estado Good condition mach.** Mach. en bon état | K = 1,05-1,20 |
| P-625 | 0,2 0,4 0,6 | 300-250 245-195 190-145 | **Maq. en mal estado Bad condition mach.** Mach. en mauvais état | K = 0,85-0,95 |
| P-720 | 0,2 0,4 0,6 | 235-125 225-115 220-100 | **Vida plaquita Insert life** Vie plaquette | $T_{min}$ 10 K = 1,10<br>$T_{min}$ 15 K = 1,00<br>$T_{min}$ 20 K = 0,93<br>$T_{min}$ 30 K = 0,84<br>$T_{min}$ 45 K = 0,76<br>$T_{min}$ 60 K = 0,71 |
| P-Cermet | 0,2 0,4 0,6 | 175-110 | | |
| P-010 | 0,2 0,4 0,6 | | | |

| Calidad Quality Qualité | K | | | |
|---|---|---|---|---|
| | f (mm) | | Factor K- Corrige Vc en función de K Factor- Correct Vc depending on Facteur K- Vc correct à cause de | |
| C-515 | 0,2 0,4 0,6 | 360-280 280-265 235-220 | **Forjados/fundidos carcasa Forging/melting w. frame** Forgeage/fondu carcasse | K = 0,70-0,80 |
| C-525 | 0,2 0,4 0,6 | 330-250 240-230 220-220 | **Torneado interior Internal turning** Tournage intérieur | K = 0,75-0,85 |
| C-540 | 0,2 0,4 0,6 | 230-220 215-205 190-185 | **Corte interrumpido Interrupted cut** Coupe interrompue | K = 0,80-0,90 |
| P-620 | 0,2 0,4 0,6 | | **Maq. en buen estado Good condition mach.** Mach. en bon état | K = 1,05-1,20 |
| P-625 | 0,2 0,4 0,6 | 220-200 210-190 200-180 | **Maq. en mal estado Bad condition mach.** Mach. en mauvais état | K = 0,85-0,95 |
| P-Cermet | 0,2 0,4 0,6 | 130-85 | **Vida plaquita Insert life** Vie plaquette | $T_{min}$ 10 K = 1,10<br>$T_{min}$ 15 K = 1,00<br>$T_{min}$ 20 K = 0,93<br>$T_{min}$ 30 K = 0,84<br>$T_{min}$ 45 K = 0,76<br>$T_{min}$ 60 K = 0,71 |
| P-010 | 0,2 0,4 0,6 | | | |

# CONDICIONES CORTE* CALIDADES TORNEADO
Turning Qualities Cutting Conditions*
Conditions coupe* qualités tournage

***Para vida herramienta de 15 min. sin refrigerante / *For 15 min. tool life without coolant / ***Pour vie outil 15 min. sans réfrigération

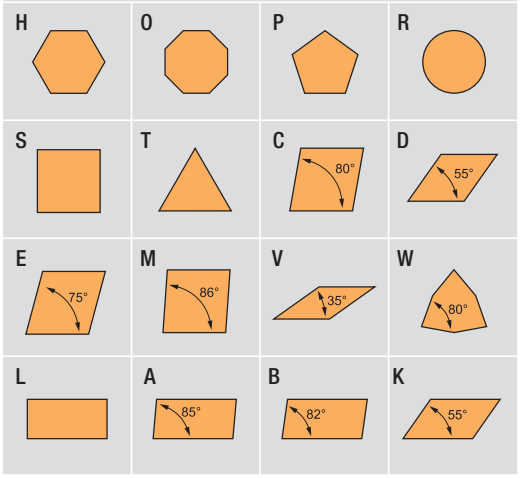
| Calidad Quality Qualité | S | | | |
|---|---|---|---|---|
| | f (mm) | | **Factor K- Corrige Vc en función de K Factor- Correct Vc depending on** Facteur K- Vc correct à cause de | |
| C-515 | 0,10 0,50 | | **Forjados/fundidos carcasa Forging/melting w. frame** Forgeage/fondu carcasse | K = 0,70-0,80 |
| C-525 | 0,10 0,50 | | **Torneado interior Internal turning** Tournage intérieur | K = 0,75-0,85 |
| C-540 | 0,10 0,50 | | **Corte interrumpido Interrupted cut** Coupe interrompue | K = 0,80-0,90 |
| P-620 | 0,10 0,50 | 75-45 50-25 | **Maq. en buen estado Good condition mach.** Mach. en bon état | K = 1,05-1,20 |
| P-625 | 0,10 0,50 | 75-45 50-25 | **Maq. en mal estado Bad condition mach.** Mach. en mauvais état | K = 0,85-0,95 |
| P-720 | 0,10 0,50 | 35-80 23-70 | **Vida plaquita Insert life** Vie plaquette | $T_{min}$ 10 K = 1,10<br>$T_{min}$ 15 K = 1,00<br>$T_{min}$ 20 K = 0,93<br>$T_{min}$ 30 K = 0,84<br>$T_{min}$ 45 K = 0,76<br>$T_{min}$ 60 K = 0,71 |
| P-Cermet | 0,10 0,50 | | | |
| P-010 | 0,10 0,50 | | | |

| Calidad Quality Qualité | N | | | |
|---|---|---|---|---|
| | f (mm) | | **Factor K- Corrige Vc en función de K Factor- Correct Vc depending on** Facteur K- Vc correct à cause de | |
| C-515 | 0,15 0,80 | | **Forjados/fundidos carcasa Forging/melting w. frame** Forgeage/fondu carcasse | K = 0,70-0,80 |
| C-525 | 0,15 0,80 | | **Torneado interior Internal turning** Tournage intérieur | K = 0,75-0,85 |
| C-540 | 0,15 0,80 | | **Corte interrumpido Interrupted cut** Coupe interrompue | K = 0,80-0,90 |
| P-620 | 0,15 0,80 | | **Maq. en buen estado Good condition mach.** Mach. en bon état | K = 1,05-1,20 |
| P-625 | 0,15 0,80 | | **Maq. en mal estado Bad condition mach.** Mach. en mauvais état | K = 0,85-0,95 |
| P-Cermet | 0,15 0,80 | | **Vida plaquita Insert life** Vie plaquette | $T_{min}$ 10 K = 1,10<br>$T_{min}$ 15 K = 1,00<br>$T_{min}$ 20 K = 0,93<br>$T_{min}$ 30 K = 0,84<br>$T_{min}$ 45 K = 0,76<br>$T_{min}$ 60 K = 0,71 |
| P-010 | 0,15 0,80 | 2400-360 240-65 | | |

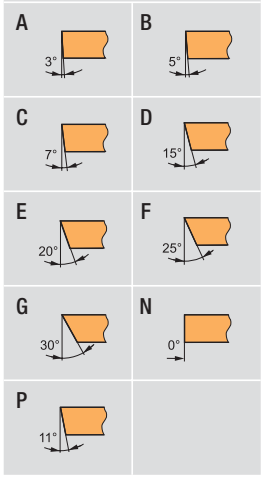
| Calidad Quality Qualité | H | | | |
|---|---|---|---|---|
| | f (mm) | | **Factor K- Corrige Vc en función de K Factor- Correct Vc depending on** Facteur K- Vc correct à cause de | |
| C-515 | 0,15 0,80 | | **Forjados/fundidos carcasa Forging/melting w. frame** Forgeage/fondu carcasse | K = 0,70-0,80 |
| C-525 | 0,15 0,80 | | **Torneado interior Internal turning** Tournage intérieur | K = 0,75-0,85 |
| C-540 | 0,15 0,80 | | **Corte interrumpido Interrupted cut** Coupe interrompue | K = 0,80-0,90 |
| P-620 | 0,15 0,80 | | **Maq. en buen estado Good condition mach.** Mach. en bon état | K = 1,05-1,20 |
| P-625 | 0,15 0,80 | | **Maq. en mal estado Bad condition mach.** Mach. en mauvais état | K = 0,85-0,95 |
| P-Cermet | 0,15 0,80 | | **Vida plaquita Insert life** Vie plaquette | $T_{min}$ 10 K = 1,10<br>$T_{min}$ 15 K = 1,00<br>$T_{min}$ 20 K = 0,93<br>$T_{min}$ 30 K = 0,84<br>$T_{min}$ 45 K = 0,76<br>$T_{min}$ 60 K = 0,71 |
| P-010 | 0,15 0,80 | | | |

# CÓDIGOS ISO ELECCIÓN PLAQUITAS TORNEADO
Turning Insert Choice ISO Codes
Codes ISO choix plaquettes tournage

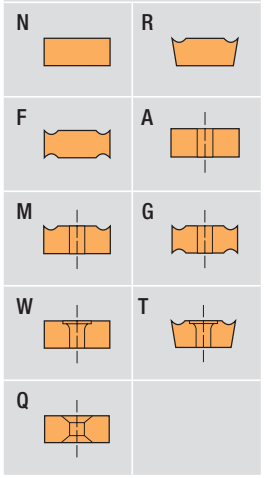
## 1
**Forma Plaquita** / Insert Shape / Forme plaquette

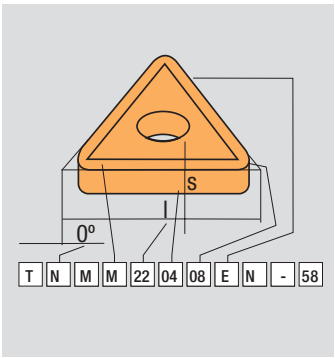



## 2
**Angulo Incidencia**
Clearance Angle / Angle d'incidence




## 4
**Tipo Plaquita**
Insert type / Type plaquette

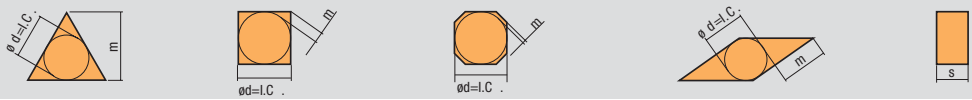



| Cod. ISO | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| | C | N | M | G |

## 3
**Tolerancias** / Tolerances / Tolérances

| | **Tolerancias** / Tolerances / Tolérances **[mm]** | | | **Tolerancias [Pulg.]** / Tolerances **[Inch]** / Tolérances **[Pouc.]** | | |
|---|---|---|---|---|---|---|
| | m (±) | s (±) | d = I.C . (±) | m (±) | s (±) | d = I.C. (±) |
| A | 0,005 | 0,025 | 0,025 | 0,0002 | 0,001 | 0,0010 |
| F | 0,005 | 0,025 | 0,013 | 0,0002 | 0,001 | 0,0005 |
| C | 0,013 | 0,025 | 0,025 | 0,0005 | 0,001 | 0,0010 |
| H | 0,013 | 0,025 | 0,013 | 0,0005 | 0,001 | 0,0005 |
| E | 0,025 | 0,025 | 0,025 | 0,0010 | 0,001 | 0,0010 |
| G | 0,025 | 0,130 | 0,025 | 0,0010 | 0,005 | 0,0010 |
| J | 0,005 | 0,025 | 0,05 ÷ 0,13 | 0,0002 | 0,001 | 0,002 ÷ 0,005 |
| K | 0,013 | 0,025 | 0,05 ÷ 0,13 | 0,0005 | 0,001 | 0,002 ÷ 0,005 |
| L | 0,025 | 0,025 | 0,05 ÷ 0,13 | 0,0010 | 0,001 | 0,002 ÷ 0,005 |
| M | 0,08 ÷ 0,18 | 0,130 | 0,05 ÷ 0,13 | 0,003 ÷ 0,007 | 0,005 | 0,002 ÷ 0,005 |
| N | 0,08 ÷ 0,18 | 0,025 | 0,05 ÷ 0,13 | 0,003 ÷ 0,007 | 0,001 | 0,002 ÷ 0,005 |
| U | 0,05 ÷ 0,38 | 0,130 | 0,08 ÷ 0,25 | 0,005 ÷ 0,015 | 0,005 | 0,003 ÷ 0,010 |



# CÓDIGOS ISO ELECCIÓN PLAQUITAS TORNEADO
Turning Insert Choice ISO Codes
Codes ISO choix plaquettes tournage

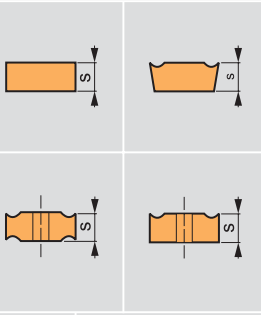
## 5

Longitud Filo Corte / Cutting Edge Length / Longuer arête coupe

| d=l.C. | | R | S | T | C | D | V | W |
|---|---|---|---|---|---|---|---|---|
| mm | pulg. inch. pouc. | | | | | | | |
| 3,97 | 5/32" | | | 06 | | | | |
| 5,00 | | 05 | | | | | | |
| 5,56 | 7/32" | | | 09 | | | | 03 |
| 6,00 | | 06 | | | | | | |
| 6,35 | 1/4" | | | 11 | 06 | 07 | | 04 |
| 8,00 | | 08 | | | | | | |
| 9,525 | 3/8" | 09 | 09 | 16 | 09 | 11 | 16 | 06 |
| 10,0 | | 10 | | | | | | |
| 12,0 | | 12 | | | | | | |
| 12,7 | 1/2" | 12 | 12 | 22 | 12 | 15 | | 08 |
| 15,875 | 5/8" | 15 | 15 | 27 | 16 | | | |
| 16,0 | | 16 | | | | | | |
| 19,05 | 3/4" | 19 | 19 | 33 | 19 | | | |
| 20,0 | | 20 | | | | | | |
| 25,0 | | 25 | | | | | | |
| 25,4 | 1" | 25 | 25 | | 25 | | | |
| 31,75 | 1 1/4" | 31 | | | | | | |
| 32,0 | | 32 | | | | | | |

## 6

Espesor / Thickness / Épaisseur




| simb. symb. | s | |
|---|---|---|
| | mm | pulg. inch. |
| 01 | 1,59 | 1/16" |
| T1 | 1,98 | |
| 02 | 2,38 | 3/32" |
| 03 | 3,18 | 1/8" |
| T3 | 3,97 | 5/32" |
| 04 | 4,76 | 3/16" |
| 05 | 5,56 | |
| 06 | 6,35 | 1/4" |
| 07 | 7,94 | 5/16" |
| 09 | 9,52 | 3/8" |

## 7

Radio Vértice / Nose Radius / Rayon pointe

| simb. symb. | $r_1$ | |
|---|---|---|
| | mm | pulg. inch. pouc. |
| 00 | 0 | 0" |
| 02 | 0,2 | |
| 04 | 0,4 | 1/64" |
| 08 | 08 | 1/32" |
| 12 | 1,2 | 3/64" |
| 16 | 1,6 | 1/16" |
| 24 | 2,4 | 3/32" |
| 32 | 3,2 | 1/8" |

| 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|
| 12 | 04 | 08 | E | - |

## 8

Longitud Filo Corte / Cutting Edge Length / Longuer arête coupe

| | |
|---|---|
| F Filos Agudos<br>Sharp Edges<br>Arêtes aigües | E Filos Reforzados<br>Rounded Edges<br>Arêtes renforcées |
| T Filos con Faceta<br>Edges with facet<br>Arêtes avec facette | S Filos achaflanados y reforzados<br>Rounded Edges with facet<br>Arêtes arrondies et renforcées |

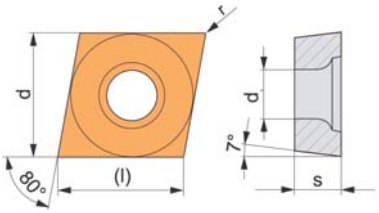
## 9

Dirección Avance / Feed Direction / Direction avance

| | |
|---|---|
| R | Avance<br>Feed |
| L | Avance<br>Feed |
| N | Avance<br>Feed<br>Avance<br>Feed |

# Ref. 8500

## PLAQUITA INTERCAMBIABLE TORNEADO CCMT
CCMT Turning Indexable Insert
Plaquette tournage CCMT



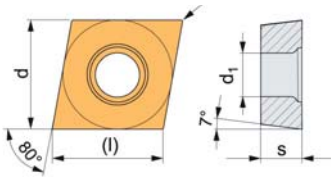

| ISO | l mm | d mm | s mm | $d_1$ mm | r mm | f mm | $a_p$ mm | | N° Art. C-G25 | N° Art. P-H20 P-720 | N° Art. P-Cer-met | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dimensiones Dimensions | | | | | Condiciones Corte Cutting Conditions Conditions coupe | | | | | | |
| **Acabado Fino / Fine Finishing /** Finition Fine | | | | | | | | | | | | |
| **CCMT-060202-E-ZMM** | 6,40 | 6,35 | 2,38 | 2,80 | 0,20 | 0,03-0,11 | 0,06-1,70 | 10 | 59269 | 59271 | | **8,50** |
| **CCMT-060204-E-ZMM** | 6,40 | 6,35 | 2,38 | 2,80 | 0,40 | 0,05-0,17 | 0,10-1,70 | 10 | 59270 | 59272 | | **8,50** |
| **CCMT-09T304-E-ZMM** | 9,70 | 9,52 | 3,97 | 4,40 | 0,40 | 0,06-0,23 | 0,11-2,00 | 10 | 42895 | 42896 | | **8,50** |
| **CCMT-09T308-E-ZMM** | 9,70 | 9,52 | 3,97 | 4,40 | 0,80 | 0,08-0,45 | 0,15-2,00 | 10 | 17842 | 17844 | | **8,50** |
| **CCMT-120404-E-ZMM** | 12,90 | 12,70 | 4,76 | 5,50 | 0,40 | 0,07-0,27 | 0,14-2,40 | 10 | 42898 | 42899 | | **10,70** |
| **CCMT-120408-E-ZMM** | 12,90 | 12,70 | 4,76 | 5,50 | 0,80 | 0,12-0,45 | 0,60-3,60 | 10 | 17845 | 17856 | | **10,70** |
| **Semi-Acabado / Semi-Finishing /** Semi-Finition | | | | | | | | | | | | |
| **CCMT-060202-E-ZRR** | 6,40 | 6,35 | 2,38 | 2,80 | 0,20 | 0,03-0,11 | 0,06-1,70 | 10 | 26277 | 10233 | | **8,50** |
| **CCMT-060204-E-ZRR** | 6,40 | 6,35 | 2,38 | 2,80 | 0,40 | 0,06-0,17 | 0,20-2,40 | 10 | 26278 | 10242 | | **8,50** |
| **CCMT-09T304-E-ZRR** | 9,70 | 9,52 | 3,97 | 4,40 | 0,40 | 0,08-0,23 | 0,25-3,00 | 10 | 26280 | 10278 | | **8,50** |
| **CCMT-09T308-E-ZRR** | 9,70 | 9,52 | 3,97 | 4,40 | 0,80 | 0,10-0,40 | 0,50-3,00 | 10 | 26281 | 10287 | | **8,50** |
| **CCMT-120404-E-ZRR** | 12,90 | 12,70 | 4,76 | 5,50 | 0,40 | 0,09-0,27 | 0,30-3,60 | 10 | 42901 | | | **10,70** |
| **CCMT-120408-E-ZRR** | 12,90 | 12,70 | 4,76 | 5,50 | 0,80 | 0,12-0,45 | 0,60-3,60 | 10 | 10131 | | | **10,70** |
| **Acabado / Finishing /** Finition | | | | | | | | | | | | |
| **CCMT-060204-ZFCE** | 6,40 | 6,35 | 2,38 | 2,80 | 0,40 | 0,05-0,40 | 0,20-1,50 | 10 | | | 19983 | **9,40** |
| **CCMT-09T304-ZFCE** | 9,70 | 9,52 | 3,97 | 4,40 | 0,40 | 0,05-0,40 | 0,20-1,50 | 10 | | | 19987 | **12,25** |
| **CCMT-09T308-ZFCE** | 9,70 | 9,52 | 3,97 | 4,40 | 0,80 | 0,05-0,40 | 0,20-1,50 | 10 | | | 19989 | **12,25** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8500 CCMT-09T304-E-ZMM C-G25**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 560, 569**

# Ref. 8501

## PLAQUITA INTERCAMBIABLE TORNEADO CCGT
CCGT Turning Indexable Insert
Plaquette tournage CCGT



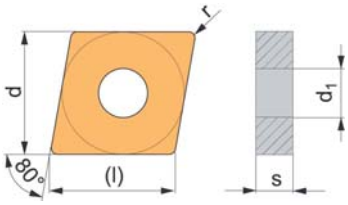

| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-710 | N° Art. P-010 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Aluminio / Aluminium** | | | | | | | | | | | |
| **CCGT-060202-F-ZAL** | 6,40 | 6,35 | 2,38 | 2,80 | 0,20 | 0,05-0,12 | 0,05-3,00 | 10 | | 42877 | **12,92** |
| **CCGT-060204-F-ZAL** | 6,40 | 6,35 | 2,38 | 2,80 | 0,40 | 0,10-0,20 | 0,10-3,00 | 10 | | 42880 | **12,92** |
| **CCGT-09T304-F-ZAL** | 9,70 | 9,52 | 3,97 | 4,40 | 0,40 | 0,10-0,22 | 0,10-5,00 | 10 | | 42883 | **14,02** |
| **CCGT-09T308-F-ZAL** | 9,70 | 9,52 | 3,97 | 4,40 | 0,80 | 0,15-0,45 | 0,10-5,00 | 10 | | 42894 | **14,02** |
| **CCGT-120402-F-ZAL** | 12,90 | 12,70 | 4,76 | 5,50 | 0,20 | 0,05-0,12 | 0,05-4,00 | 10 | | 72544 | **15,11** |
| **CCGT-120404-F-ZAL** | 12,90 | 12,70 | 4,76 | 5,50 | 0,40 | 0,10-0,26 | 0,10-5,00 | 10 | 72061 | 71634 | **15,11** |
| **CCGT-120408-F-ZAL** | 12,90 | 12,70 | 4,76 | 5,50 | 0,80 | 0,15-0,50 | 0,10-5,50 | 10 | 72064 | 72066 | **15,11** |
| **INOX / Stainless / Inox** | | | | | | | | | | | |
| **CCGT-060202-E-ZNF** | 6,40 | 6,35 | 2,38 | 2,80 | 0,20 | 0,05-0,12 | 0,05-3,00 | 10 | 42875 | | **12,92** |
| **CCGT-060204-E-ZNF** | 6,40 | 6,35 | 2,38 | 2,80 | 0,40 | 0,10-0,20 | 0,10-3,00 | 10 | 42878 | | **12,92** |
| **CCGT-09T304-E-ZNF** | 9,70 | 9,52 | 3,97 | 4,40 | 0,40 | 0,10-0,22 | 0,10-5,00 | 10 | 42881 | | **14,02** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8501 CCGT-060202-F-AL P-010**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 560, 569**

# Ref. 8510

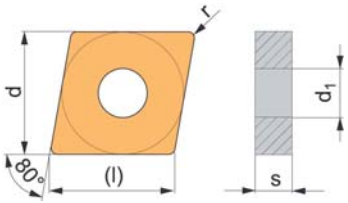
## PLAQUITA INTERCAMBIABLE TORNEADO CNMG
CNMG Turning Indexable Insert
Plaquette tournage CNMG




| | ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G15 C-515 | N° Art. C-G25 C-525 | N° Art. C-G40 C-540 | N° Art. P-710 | N° Art. P-720 | N° Art. P-Cer-met | N° Art. P-010 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Wiper** | | | | | | | | | | | | | | | | |
| | **CNMG-120408-E-ZWM** | 12,90 | 12,70 | 4,76 | 5,16 | 0,80 | 0,15-0,60 | 0,50-5,00 | 10 | | 17922 | | | | | | **10,70** |
| | **Acabado / Finishing /** Finition | | | | | | | | | | | | | | | | |
| | **CNMG-090304-E-ZFM** | 9,70 | 9,52 | 3,18 | 3,81 | 0,40 | 0,05-0,25 | 0,10-1,50 | 10 | | 59273 | | | | | | **8,13** |
| | **CNMG-090308-E-ZFM** | 9,70 | 9,52 | 3,18 | 3,81 | 0,80 | 0,10-0,40 | 0,10-1,50 | 10 | | 59274 | | | | | | **8,13** |
| | **CNMG-120404-E-ZFM** | 12,90 | 12,70 | 4,76 | 5,16 | 0,40 | 0,07-0,30 | 0,40-2,50 | 10 | 17863 | 26286 | | 17866 | | | | **9,61** |
| | **CNMG-120408-E-ZFM** | 12,90 | 12,70 | 4,76 | 5,16 | 0,80 | 0,10-0,40 | 0,40-2,50 | 10 | 42902 | 42903 | | | | | | **9,61** |
| | **Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | | | | | | | | |
| | **CNMG-120404-E-ZM** | 12,90 | 12,70 | 4,76 | 5,16 | 0,40 | 0,10-0,30 | 0,40-5,50 | 10 | 42905 | 42906 | | | | | | **9,61** |
| | **CNMG-120408-E-ZM** | 12,90 | 12,70 | 4,76 | 5,16 | 0,80 | 0,15-0,50 | 0,50-5,50 | 10 | 17867 | 26292 | 17873 | | | | | **9,61** |
| | **CNMG-120412-E-ZM** | 12,90 | 12,70 | 4,76 | 5,16 | 1,20 | 0,18-0,60 | 0,80-5,50 | 10 | 17885 | 26290 | 28592 | | | | | **9,61** |
| | **CNMG-190608-E-ZM** | 19,30 | 19,05 | 6,35 | 7,94 | 0,80 | 0,15-0,60 | 0,80-6,00 | 10 | 42907 | 42908 | | | | | | **25,82** |
| | **CNMG-190612-E-ZM** | 19,30 | 19,05 | 6,35 | 7,94 | 1,20 | 0,18-0,60 | 0,80-8,60 | 10 | 42910 | 42912 | | | | | | **25,82** |
| | **Desbaste / Roughing /** Ébauche | | | | | | | | | | | | | | | | |
| | **CNMG-120408-E-ZR** | 12,90 | 12,70 | 4,76 | 5,16 | 0,80 | 0,20-0,55 | 1,00-7,00 | 10 | 17893 | 26289 | 17902 | | | | | **9,61** |
| | **CNMG-120412-E-ZR** | 12,90 | 12,70 | 4,76 | 5,16 | 1,20 | 0,25-0,60 | 1,00-7,00 | 10 | 17909 | 26293 | 17911 | | | | | **9,61** |
| | **CNMG-160608-E-ZR** | 16,10 | 15,88 | 6,35 | 6,35 | 0,80 | 0,20-0,55 | 1,00-8,00 | 10 | 21949 | 21951 | | | | | | **20,20** |
| | **CNMG-160612-E-ZR** | 16,10 | 15,88 | 6,35 | 6,35 | 1,20 | 0,20-0,55 | 1,00-8,00 | 10 | 21952 | 21953 | | | | | | **20,20** |
| | **CNMG-190608-E-ZR** | 19,30 | 19,05 | 6,35 | 7,94 | 0,80 | 0,25-0,60 | 3,00-8,00 | 10 | 42913 | 42914 | | | | | | **25,82** |
| | **CNMG-190612-E-ZR** | 19,30 | 19,05 | 6,35 | 7,94 | 1,20 | 0,25-0,70 | 2,00-10,00 | 10 | 42915 | 42916 | | | | | | **25,82** |
| | **Acabado / Finishing /** Finition | | | | | | | | | | | | | | | | |
| | **CNMG-120404-E-ZFCE** | 12,90 | 12,70 | 4,76 | 5,16 | 0,40 | 0,05-0,40 | 0,30-3,00 | 10 | | | | | | 16630 | | **15,49** |
| | **Semi-Acabado / Semi-Finishing /** Semi-Finition | | | | | | | | | | | | | | | | |
| | **CNMG-120408-E-ZMCE** | 12,90 | 12,70 | 4,76 | 5,16 | 0,80 | 0,10-4,00 | 0,30-3,00 | 10 | | | | | | 19981 | | **15,49** |
| | **INOX Semi-Desbaste / Semi-Roughing Stainless /** INOX Semi-Ébauche | | | | | | | | | | | | | | | | |
| | **CNMG-120404-E-ZNM** | 12,90 | 12,70 | 4,76 | 5,16 | 0,40 | 0,10-0,25 | 0,50-5,70 | 10 | | | | | 35197 | | | **9,61** |
| | **CNMG-120408-E-ZNM** | 12,90 | 12,70 | 4,76 | 5,16 | 0,80 | 0,12-0,45 | 0,50-5,70 | 10 | | | | | 35198 | | | **9,61** |
| New! | **ALUMINIUM Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | | | | | | | | |
| | **CNMG-120404-ZAL** | 12,90 | 12,70 | 4,76 | 5,16 | 0,40 | 0,10-0,30 | 0,40-5,50 | 10 | | | | | | | 70097 | **9,61** |
| | **CNMG-120408-ZAL** | 12,90 | 12,70 | 4,76 | 5,16 | 0,80 | 0,15-0,50 | 0,50-5,50 | 10 | | | | | | | 70100 | **9,61** |
| | **CNMG-120412-ZAL** | 12,90 | 12,70 | 4,76 | 5,16 | 1,20 | 0,18-0,60 | 0,80-5,50 | 10 | | | | | | | 70105 | **9,61** |

# Ref. 8510

## PLAQUITA INTERCAMBIABLE TORNEADO CNMG
CNMG Turning Indexable Insert
Plaquette tournage CNMG




| | ISO | l mm | d mm | s mm | $d_1$ mm | r mm | f mm | $a_p$ mm | | N° Art. C-G15 | N° Art. C-G25 | N° Art. C-S15 | N° Art. C-S25 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Semi-Desbaste Alto Rendimiento / High Performance Semi-Roughing /** Semi-Ébauche Haut Rendement | | | | | | | | | | | | | |
| | **CNMG-120404- ZPM** | 12,90 | 12,70 | 4,76 | 5,16 | 0,40 | 0,10-0,30 | 0,40-5,50 | 10 | 71279 | 71280 | | | **10,57** |
| | **CNMG-120408-ZPM** | 12,90 | 12,70 | 4,76 | 5,16 | 0,80 | 0,15-0,50 | 0,50-5,50 | 10 | 71281 | 71282 | | | **10,57** |
| | **CNMG-120412-ZPM** | 12,90 | 12,70 | 4,76 | 5,16 | 1,20 | 0,18-0,60 | 0,80-5,50 | 10 | 71283 | 71284 | | | **10,57** |
| | **INOX Acabado Alto Rendimiento / High Performance Finishing Stainless /** INOX Finition Haut Rendement | | | | | | | | | | | | | |
| | **CNMG-120404-ZNF** | 12,90 | 12,70 | 4,76 | 5,16 | 0,40 | 0,10-0,30 | 0,40-5,50 | 10 | | | 16950 | 16954 | **10,57** |
| | **CNMG-120408-ZNF** | 12,90 | 12,70 | 4,76 | 5,16 | 0,80 | 0,15-0,50 | 0,50-5,50 | 10 | | | 82849 | 16955 | **10,57** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8510 CNMG-120408-ZWM C-G25**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 555, 557, 565, 568**

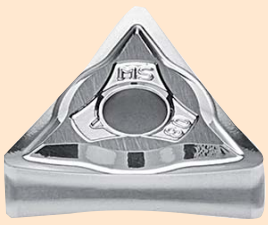
**Rompevirutas**
Chipbreaker
Brisecopeaux

# ZAL

## AHORA TAMBIÉN EN PLAQUITAS NEGATIVAS
Now in Negative Inserts too
Maintenant dans des plaquettes négatives aussi

**Semi-Desbaste / Semi-Roughing /** Semi-Ébauche

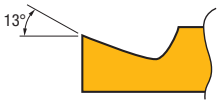
**CNMG**



**TNMG**

**N**

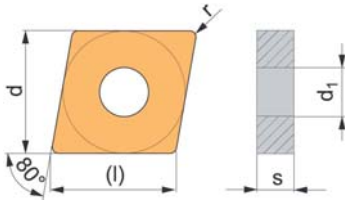
**Materiales No Ferrosos**
Non-ferrous materials
Matériaux non ferreux




**Arista de corte**
Cutting edge
Arete coupe

# Ref. 8512

## PLAQUITA INTERCAMBIABLE TORNEADO CNMM
CNMM Turning Indexable Insert
Plaquette tournage CNMM




| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G25 C-525 | N° Art. P-625* | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Desbaste / Roughing /** Ébauche | | | | | | | | | | | |
| **CNMM-120408-E-ZR** | 12,90 | 12,70 | 4,76 | 5,16 | 0,80 | 0,25-0,60 | 1,00-8,50 | 10 | 10750 | 10756 | **14,01** |
| **CNMM-120412-E-ZR** | 12,90 | 12,70 | 4,76 | 5,16 | 1,20 | 0,25-0,80 | 1,20-8,50 | 10 | 10753 | | **14,01** |
| New! **CNMM-160608-E-ZR** | 16,10 | 15,88 | 6,35 | 6,35 | 0,80 | 0,20-0,55 | 1,00-8,00 | 10 | 51335 | | **18,46** |
| New! **CNMM-160612-E-ZR** | 16,10 | 15,88 | 6,35 | 6,35 | 1,20 | 0,25-0,60 | 1,00-8,00 | 10 | 32996 | | **18,46** |
| New! **CNMM-190612-E-ZR** | 19,30 | 19,05 | 6,35 | 7,94 | 1,20 | 0,25-0,70 | 2,00-10,00 | 10 | 25718 | | **25,51** |
| New! **CNMM-190616-E-ZR** | 19,30 | 19,05 | 6,35 | 7,94 | 1,60 | 0,32-0,80 | 2,00-10,00 | 10 | 25719 | | **25,51** |
| **Desbaste Pesado / Heavy Roughing /** Ebauche lourd | | | | | | | | | | | |
| New! **CNMM-190612-E-ZHR** | 19,30 | 19,05 | 6,35 | 7,94 | 1,20 | 0,50-0,80 | 2,40-12,00 | 10 | 59747 | | **25,51** |
| New! **CNMM-190616-E-ZHR** | 19,30 | 19,05 | 6,35 | 7,94 | 1,60 | 0,50-1,10 | 2,40-12,00 | 10 | 74857 | | **25,51** |

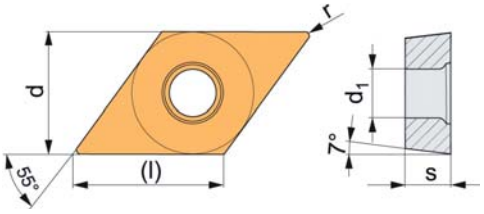
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8512 CNMM-120408-E-ZR C-525**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 555, 557, 565, 568**

* **P-625 hasta fin de existencias** / **while stock lasts** / jusqu'à la fin de stock

# Ref. 8515

## PLAQUITA INTERCAMBIABLE TORNEADO DCGT
DCGT Turning Indexable Insert
Plaquette tournage DCGT



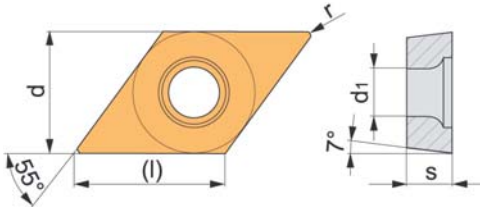

| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-010 | N° Art. P-H20 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Aluminio / Aluminium** | | | | | | | | | | | |
| **DCGT-070202-F-ZAL** | 7,80 | 6,35 | 2,38 | 2,80 | 0,20 | 0,02-0,12 | 0,10-1,50 | 10 | 29902 | | **12,92** |
| **DCGT-070204-F-ZAL** | 7,80 | 6,35 | 2,38 | 2,80 | 0,40 | 0,10-0,20 | 0,10-4,00 | 10 | 29903 | | **12,92** |
| **DCGT-11T302-F-ZAL** | 11,60 | 9,52 | 3,97 | 4,40 | 0,20 | 0,05-0,12 | 0,05-4,00 | 10 | 29906 | | **14,02** |
| **DCGT-11T304-F-ZAL** | 11,60 | 9,52 | 3,97 | 4,40 | 0,40 | 0,10-0,22 | 0,10-5,00 | 10 | 29910 | | **14,02** |
| **INOX / Stainless** / Inox | | | | | | | | | | | |
| **DCGT-070202-E-ZNF** | 7,80 | 6,35 | 2,38 | 2,80 | 0,20 | 0,02-0,12 | 0,10-1,50 | 10 | | 29901 | **12,92** |
| **DCGT-070204-E-ZNF** | 7,80 | 6,35 | 2,38 | 2,80 | 0,40 | 0,10-0,20 | 0,10-4,00 | 10 | | 29905 | **12,92** |
| **DCGT-11T302-E-ZNF** | 11,60 | 9,52 | 3,97 | 4,40 | 0,20 | 0,05-0,12 | 0,05-4,00 | 10 | | 29908 | **14,02** |
| **DCGT-11T304-E-ZNF** | 11,60 | 9,52 | 3,97 | 4,40 | 0,40 | 0,10-0,22 | 0,10-5,00 | 10 | | 29911 | **14,02** |

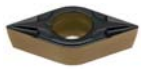
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8515 DCGT-070202-F-ZAL P-010**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 561, 569**

# Ref. 8520

## PLAQUITA INTERCAMBIABLE TORNEADO DCMT
DCMT Turning Indexable Insert
Plaquette tournage DCMT



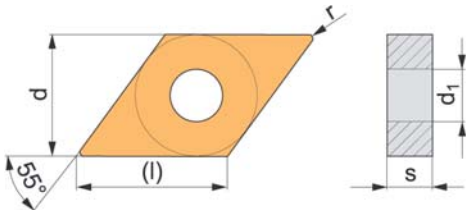

| | ISO | **Dimensiones** Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | **Condiciones Corte** Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G25 | N° Art. P-H20 P-720 | N° Art. P-Cer-met | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Acabado Fino / Fine Finishing /** Finition Fine | | | | | | | | | | | | |
|  | **DCMT-070202-E-ZRR** | 7,80 | 6,35 | 2,38 | 2,80 | 0,20 | 0,03-0,11 | 0,06-1,50 | 10 | 59275 | 43990 | | **8,50** |
| | **DCMT-070204-E-ZRR** | 7,80 | 6,35 | 2,38 | 2,80 | 0,40 | 0,05-0,17 | 0,08-1,50 | 10 | 26295 | 17927 | | **8,50** |
| | **DCMT-11T302-E-ZRR** | 11,60 | 9,52 | 3,97 | 4,40 | 0,20 | 0,04-0,15 | 0,08-2,00 | 10 | 59276 | 43449 | | **8,50** |
| | **DCMT-11T304-E-ZRR** | 11,60 | 9,52 | 3,97 | 4,40 | 0,40 | 0,06-0,23 | 0,11-2,00 | 10 | 26296 | 17962 | | **8,50** |
| | **DCMT-11T308-E-ZRR** | 11,60 | 9,52 | 3,97 | 4,40 | 0,80 | 0,08-0,30 | 0,15-2,00 | 10 | 26298 | 28593 | | **8,50** |
| | **Acabado / Finishing /** Finition | | | | | | | | | | | | |
| | **DCMT-070204-ZFCE** | 7,80 | 6,35 | 2,38 | 2,80 | 0,40 | 0,05-0,40 | 0,20-1,50 | 10 | | | 19990 | **9,36** |
| | **DCMT-11T304-ZFCE** | 11,60 | 9,52 | 3,97 | 4,40 | 0,40 | 0,05-0,40 | 0,20-1,50 | 10 | | | 19994 | **12,98** |
| | **DCMT-11T308-ZFCE** | 11,60 | 9,52 | 3,97 | 4,40 | 0,80 | 0,05-0,40 | 0,20-1,50 | 10 | | | 19996 | **12,98** |
| | **INOX Semi-Desbaste / Semi-Roughing Stainless /** Inox Semi-Ébauche | | | | | | | | | | | | |
| | **DCMT-11T304-E-ZMM** | 11,60 | 9,52 | 3,97 | 4,40 | 0,4 | 0,08-0,23 | 0,25-3,00 | 10 | | 66820 | | **8,50** |
| | **DCMT-11T308-E-ZMM** | 11,60 | 9,52 | 3,97 | 4,40 | 0,8 | 0,10-0,40 | 0,50-3,00 | 10 | | 66821 | | **8,50** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8520 DCMT-070202-E-ZRR C-G25**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 561, 569**

# Ref. 8530

## PLAQUITA INTERCAMBIABLE TORNEADO DNMG
DNMG Turning Indexable Insert
Plaquette tournage DNMG




| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G15 C-515 | N° Art. C-G25 | N° Art. C-540 | N° Art. P-H20 | N° Art. P-720 | N° Art. P-Cermet | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Acabado / Finishing /** Finition | | | | | | | | | | | | | | | |
| **DNMG-110404-E-ZF** | 11,60 | 9,52 | 4,76 | 3,81 | 0,40 | 0,05-0,25 | 0,10-1,50 | 10 | 42917 | 42918 | | | | | **9,61** |
| **DNMG-110408-E-ZF** | 11,60 | 9,52 | 4,76 | 3,81 | 0,80 | 0,10-0,40 | 0,10-1,50 | 10 | 59277 | 59279 | | | | | **9,61** |
| **DNMG-150404-E-ZF** | 15,50 | 12,70 | 4,76 | 5,16 | 0,40 | 0,05-0,25 | 0,10-1,50 | 10 | 17965 | 26299 | | 17968 | | | **13,28** |
| **DNMG-150408-E-ZF** | 15,50 | 12,70 | 4,76 | 5,16 | 0,80 | 0,10-0,40 | 0,10-1,50 | 10 | 59278 | 59280 | | | | | **13,28** |
| **Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | | | | | | | |
| **DNMG-110408-E-ZM** | 11,60 | 9,52 | 4,76 | 3,81 | 0,80 | 0,10-0,40 | 0,10-1,50 | 10 | | 26301 | 15413 | | | | **9,61** |
| **DNMG-150408-E-ZM** | 15,50 | 12,70 | 4,76 | 5,16 | 0,80 | 0,15-0,50 | 0,50-6,00 | 10 | 17973 | 26302 | 17976 | | | | **13,28** |
| **DNMG-150604-E-ZM** | 15,50 | 12,70 | 6,35 | 5,16 | 0,40 | 0,10-0,30 | 0,40-6,00 | 10 | 59281 | 59282 | | | | | **14,02** |
| **DNMG-150608-E-ZM** | 15,50 | 12,70 | 6,35 | 5,16 | 0,80 | 0,15-0,50 | 0,50-6,00 | 10 | 17977 | 26304 | 17989 | | | | **14,02** |
| **DNMG-150612-E-ZM** | 15,50 | 12,70 | 6,35 | 5,16 | 1,20 | 0,18-0,60 | 0,80-6,00 | 10 | 17997 | 26305 | 18003 | | | | **14,02** |
| **Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | | | | | | | |
| **DNMG-150608-EL-ZSX** | 15,50 | 12,70 | 6,35 | 5,16 | 0,80 | 0,14-0,50 | 0,80-5,00 | 10 | | 26272 | | | | | **14,02** |
| **DNMG-150608-ER-ZSX** | 15,50 | 12,70 | 6,35 | 5,16 | 0,80 | 0,14-0,50 | 0,80-5,00 | 10 | | 10341 | | | | | **14,02** |
| **Acabado / Finishing /** Finition | | | | | | | | | | | | | | | |
| **DNMG-150404-ZFCE** | 15,50 | 12,70 | 4,76 | 5,16 | 0,40 | 0,05-0,40 | 0,20-1,50 | 10 | | | | | | 20001 | **18,75** |
| **Semi-Acabado / Semi-Finishing /** Semi-Finition | | | | | | | | | | | | | | | |
| **DNMG-150404-ZMCE** | 15,50 | 12,70 | 4,76 | 5,16 | 0,40 | 0,05-0,40 | 0,20-1,50 | 10 | | | | | | 20002 | **18,75** |
| **INOX Semi-Desbaste / Semi-Roughing Stainless /** INOX Semi-Ébauche | | | | | | | | | | | | | | | |
| **DNMG-150604-E-ZNM** | 15,50 | 12,70 | 6,35 | 5,16 | 0,40 | 0,10-0,30 | 0,30-6,00 | 10 | | | | | 35199 | | **14,02** |
| **DNMG-150608-E-ZNM** | 15,50 | 12,70 | 6,35 | 5,16 | 0,80 | 0,12-0,45 | 0,50-6,40 | 10 | | | | | 35200 | | **14,02** |

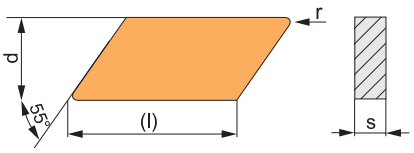
| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G15 | N° Art. C-G25 | N° Art. C-S15 | N° Art. C-S25 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Desbaste Alto Rendimiento / High Performance Semi-Roughing /** Semi-Ébauche Haut Rendement | | | | | | | | | | | | | |
| **DNMG-150404-ZPM** | 15,50 | 12,70 | 4,76 | 5,16 | 0,40 | 0,15-0,50 | 0,50-6,00 | 10 | 71285 | 71286 | | | **14,61** |
| **DNMG-150408-ZPM** | 15,50 | 12,70 | 4,76 | 5,16 | 0,80 | 0,15-0,50 | 0,50-6,00 | 10 | 71287 | 71288 | | | **14,61** |
| **DNMG-150608-ZPM** | 15,50 | 12,70 | 6,35 | 5,16 | 0,80 | 0,15-0,50 | 0,50-6,00 | 10 | 71289 | 71290 | | | **15,43** |
| **INOX Acabado Alto Rendimiento / High Performance Finishing Stainless /** INOX Finition Haut Rendement | | | | | | | | | | | | | |
| **DNMG-150604-ZNF** | 15,50 | 12,70 | 6,35 | 5,16 | 0,40 | 0,10-0,30 | 0,30-6,00 | 10 | | | 16956 | 16958 | **15,43** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8530 DNMG-110404-E-ZF C-G15**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 558, 568**

# Ref. 8535

## PLAQUITA INTERCAMBIABLE TORNEADO KNUX
KNUX Turning Indexable Insert
Plaquette tournage KNUX




| ISO | Dimensiones Dimensions l mm | d mm | s mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G25 | € |
|---|---|---|---|---|---|---|---|---|---|
| **Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | |
| **KNUX-160405-SR-Z3** | 16,50 | 9,52 | 4,76 | 0,50 | 0,20-0,35 | 1,00-6,00 | 10 | 13393 | **13,65** |
| **KNUX-160405-SL-Z3** | 16,50 | 9,52 | 4,76 | 0,50 | 0,20-0,35 | 1,00-6,00 | 10 | 13396 | **13,65** |
| **KNUX-160410-SR-Z3** | 16,50 | 9,52 | 4,76 | 1,00 | 0,40-0,70 | 1,50-6,00 | 10 | 13399 | **13,65** |
| **KNUX-160410-SL-Z3** | 16,50 | 9,52 | 4,76 | 1,00 | 0,40-0,70 | 1,50-6,00 | 10 | 13400 | **13,65** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8535 KNUX-160405-SR-Z3 C-G25**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 552**

IZAR VENDING

Ancho: 1050 mm.
Fondo: 970 mm.
Alto: 1825 mm.

- 7 bandejas hasta 10 carriles/ bandeja
- Regulables en ancho y alto
- Hasta 27 unidades de fondo
- **Más armarios y sistemas de dispensación disponibles**

Width: 1050 mm.
Depth: 970 mm.
Height: 1825 mm.

- 7 trays. Up to 10rails/tray
- Adjustable height and width
- Up to 27 units in depth per lane
- **Other cabinet models available**

Largeur: 1050 mm.
Profondeur: 970 mm.
Hauteur: 1825 mm.

- 7 plateaux jusqu'à 10 voies / plateau.
- Réglable en largeur et en hauteur.
- Jusqu'à 27 unités d'arrière-plan.
- Plus de systèmes de vente et de distribution disponibles.

**PROBLEMAS A LOS QUE HACE FRENTE**

- Abuso en el consumo de productos.
- Conciencia del gasto por los empleados.
- Con elevador, evita las roturas de herramienta.
- Identificación (tarjeta) compatible con el de la empresa.

**IT ADDRESSES THE FOLLOWING PROBLEMS**

- Unnecessary consumption.
- Consumption awareness.
- The elevator avoids the damaging of the tools.
- Identification card compatible with the employee´s company card.

**PROBLÈMES QUI IL FACE**

- Abus dans la consommation de produits.
- Conscience des dépenses des employés.
- Avec ascenseur, empêche la casse de l'outil.
- Identification (carte) compatible avec celle de l'entreprise.

**BENEFICIOS PARA EL USUARIO**
**OPTIMIZACIÓN DE PRODUCTIVIDAD EN TIEMPOS Y COSTES**

- Producen un efecto autorregulador en los empleados racionalizando el consumo.
- Optimizan el trabajo y la gestión en los almacenes.
- Sencillez en la implantación de cambios en el sistema según las necesidades particulares.

**BENEFITS FOR THE USER**
**PRODUCTIVITY OPTIMISATION BOTH IN TIME AND COST**

- It produces a self-regulatory effect, reducing the average consumption.
- It improves the warehouse workflow.
- Easily customizable to suit the needs of each particular client.

**AVANTAGES POUR L'UTILISATEUR**
**OPTIMISATION DE LA PRODUCTIVITÉ EN TEMPS ET EN COÛTS**

- Ils produisent un effet d'autorégulation sur les employés en rationalisant la consommation.
- Ils optimisent le travail et la gestion dans les entrepôts.
- Simplicité dans la mise en œuvre des changements dans le système en fonction des besoins particuliers.

Precio: A consultar
comercial@izartool.com
94 630 02 41
**Servicio Técnico 24h 365 días**
**Sencilla instalación y uso**

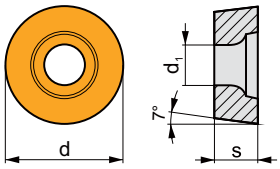
Price: Please contact us for quotation requests at:
export@izartool.com
+34 94 630 02 46
**24/7/365 Technical support**
**Simple installation. Ease of use.**

Prix : Consulter
france@izartool.com
+34 94 630 02 45
**Service technique 24h/24 / 365**
**Installation et utilisation simples**

# Ref. 8536

## PLAQUITA INTERCAMBIABLE TORNEADO RCGT
RCGT Turning Indexable Insert
Plaquette tournage RCGT

New!




| ISO | Dimensiones Dimensions d mm | s mm | $d_1$ mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-010 | € |
|---|---|---|---|---|---|---|---|---|
| **Acabado / Finishing /** Finition | | | | | | | | |
| **RCGT-0803M0-F-ZAL** | 8,00 | 3,18 | 3,40 | 0,05-0,25 | 0,50-2,50 | 10 | 70773 | **12,92** |
| **RCGT-1003M0-F-ZAL** | 10,00 | 3,18 | 4,40 | 0,10-0,30 | 1,00-3,00 | 10 | 48761 | **15,11** |
| **RCGT-1204M0-F-ZAL** | 12,00 | 4,76 | 4,40 | 0,10-0,35 | 1,00-3,50 | 10 | 45170 | **16,74** |

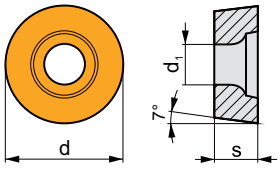
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8536 RCGT-0803M0-F-ZAL P-010**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 561**

# Ref. 8537

## PLAQUITA INTERCAMBIABLE TORNEADO RCMT
RCMT Turning Indexable Insert
Plaquette tournage RCMT

New!



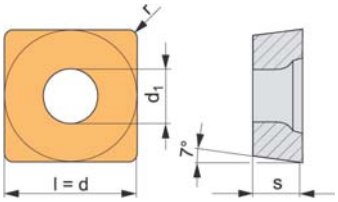

| ISO | Dimensiones Dimensions d mm | s mm | $d_1$ mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G15 | N° Art. C-G25 | N° Art. P-H10 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Desbaste / Semi-Roughing** / Semi-Ébauche | | | | | | | | | | |
| **RCMT-0803M0-E-ZRR** | 8,00 | 3,18 | 3,40 | 0,10-0,80 | 0,80-3,20 | 10 | 70749 | 77229 | | **8,50** |
| **RCMT-1003M0-E-ZRR** | 10,00 | 3,18 | 4,40 | 0,12-1,00 | 1,00-4,00 | 10 | 70752 | 13773 | | **8,50** |
| **RCMT-10T3M0-E-ZRR** | 10,00 | 3,97 | 4,40 | 0,16-1,40 | 1,00-4,00 | 10 | 80783 | 80786 | | **8,50** |
| **RCMT-1204M0-E-ZRR** | 12,00 | 4,76 | 4,40 | 0,20-1,80 | 1,20-4,80 | 10 | 70755 | 44214 | | **9,61** |
| **RCMT-1606M0-E-ZRR** | 16,00 | 6,35 | 5,50 | 0,25-2,30 | 1,60-6,40 | 10 | 70758 | 69051 | | **20,20** |
| **INOX Semi-Acabado / Semi-Finishing Stainless** / Inox Semi-Finition | | | | | | | | | | |
| **RCMT-0803M0-E-ZMM** | 8,00 | 3,18 | 3,40 | 0,15-0,40 | 0,50-3,00 | 10 | | | 24544 | **8,86** |
| **RCMT-1003M0-E-ZMM** | 10,00 | 3,18 | 4,40 | 0,15-0,45 | 0,75-4,00 | 10 | | | 53622 | **8,86** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8537 RCMT-0803M0-E-ZRR C-G15**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 561**

# Ref. 8540

## PLAQUITA INTERCAMBIABLE TORNEADO SCMT
SCMT Turning Indexable Insert
Plaquette tournage SCMT



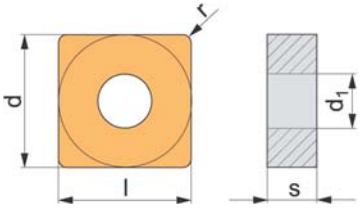

| | ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | Condiciones Corte Cutting Conditions Conditions coupe r mm | f mm | $a_p$ mm | | N° Art. C-525 | N° Art. P-720 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Acabado / Finishing /** Finition | | | | | | | | | | | |
| | **SCMT-09T304-E-Z7** | 9,52 | 9,52 | 3,97 | 4,40 | 0,40 | 0,06-0,23 | 0,11-2,00 | 10 | 26307 | | **8,86** |
| | **SCMT-09T308-E-Z7** | 9,52 | 9,52 | 3,97 | 4,40 | 0,80 | 0,08-0,30 | 0,15-2,00 | 10 | 26308 | | **8,86** |
| | **Semi-Acabado / Semi-Finishing /** Semi-Finition | | | | | | | | | | | |
| | **SCMT-120408-E-Z8** | 12,70 | 12,70 | 4,76 | 5,50 | 0,80 | 0,12-0,45 | 0,60-3,60 | 10 | 26310 | | **10,70** |
| | **SCMT-120412-E-Z8** | 12,70 | 12,70 | 4,76 | 5,50 | 1,20 | 0,14-0,60 | 0,72-3,60 | 10 | 26311 | | **10,70** |
| | **Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | | | |
| | **SCMT-120404-E-ZRR** | 12,70 | 12,70 | 4,76 | 5,50 | 0,40 | 0,09-0,27 | 0,30-3,60 | 10 | | 81193 | **10,70** |
| | **SCMT-120408-E-ZRR** | 12,70 | 12,70 | 4,76 | 5,50 | 0,80 | 0,12-0,45 | 0,60-3,60 | 10 | 18015 | 18021 | **10,70** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8540 SCMT-09T304-E-Z7 C-525**

**Porta Plaquitas bajo demanda** / Tool Holder upon request / Porte-Plaquettes sur demande

# Ref. 8550

## PLAQUITA INTERCAMBIABLE TORNEADO SNMG
SNMG Turning Indexable Insert
Plaquette tournage SNMG




| | ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G15 C-515 | N° Art. C-G25 C-525 | N° Art. C-G40 C-540 | N° Art. P-710 | N° Art. P-720 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Acabado / Finishing /** Finition | | | | | | | | | | | | | | |
| | **SNMG-120404-E-ZFM** | 12,70 | 12,70 | 4,76 | 5,16 | 0,40 | 0,05-0,25 | 0,10-1,50 | 10 | 18039 | 26313 | | 18044 | | **9,60** |
| | **SNMG-120408-E-ZFM** | 12,70 | 12,70 | 4,76 | 5,16 | 0,80 | 0,10-0,40 | 0,10-1,50 | 10 | | 42919 | | | | **9,60** |
| | **Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | | | | | | |
| | **SNMG-120408-E-ZM** | 12,70 | 12,70 | 4,76 | 5,16 | 0,80 | 0,15-0,50 | 0,50-6,00 | 10 | 18045 | 26314 | | | | **9,60** |
| | **SNMG-120412-E-ZM** | 12,70 | 12,70 | 4,76 | 5,16 | 1,20 | 0,18-0,60 | 0,80-6,00 | 10 | 18047 | 26316 | 18055 | | | **9,60** |
| | **Desbaste / Roughing /** Ébauche | | | | | | | | | | | | | | |
| | **SNMG-120408-E-ZR** | 12,70 | 12,70 | 4,76 | 5,16 | 0,80 | 0,20-0,55 | 0,80-7,00 | 10 | | 18078 | 18079 | | | **9,60** |
| | **SNMG-120412-E-ZR** | 12,70 | 12,70 | 4,76 | 5,16 | 1,20 | 0,25-0,70 | 1,00-7,00 | 10 | 18085 | | 18171 | | | **9,60** |
| | **INOX Semi-Desbaste / Semi-Roughing Stainless /** INOX Semi-Ébauche | | | | | | | | | | | | | | |
| | **SNMG-090304-E-ZNM** | 9,52 | 9,52 | 3,18 | 3,81 | 0,40 | 0,10-0,30 | 0,50-4,50 | 10 | | | | | 73532 | **8,90** |
| | **SNMG-120408-E-ZNM** | 12,70 | 12,70 | 4,76 | 5,16 | 0,80 | 0,12-0,45 | 0,50-6,40 | 10 | | | | | 35206 | **9,60** |
| | **SNMG-120412-E-ZNM** | 12,70 | 12,70 | 4,76 | 5,16 | 1,20 | 0,15-0,60 | 0,50-6,40 | 10 | | | | | 72894 | **10,65** |

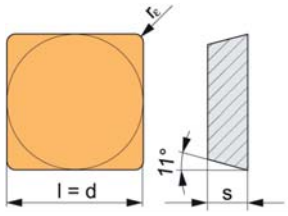
| | ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-S15 | N° Art. C-S25 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **INOX Acabado Alto Rendimiento / High Performance Finishing Stainless /** INOX Finition Haut Rendement | | | | | | | | | | | |
| | **SNMG-120408-ZNF** | 12,70 | 12,70 | 4,76 | 5,16 | 0,80 | 0,12-0,45 | 0,50-6,40 | 10 | 81957 | 16979 | **10,65** |
| | **SNMG-120412-ZNF** | 12,70 | 12,70 | 4,76 | 5,16 | 1,20 | 0,15-0,60 | 0,50-6,40 | 10 | 16984 | 16985 | **10,65** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8550 SNMG-120404-E-ZFM C-515**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 558**

# Ref. 8554

## PLAQUITA INTERCAMBIABLE TORNEADO SPUN
SPUN Turning Indexable Insert
Plaquette tournage SPUN



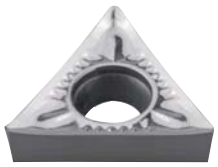

| | ISO | Dimensiones Dimensions l mm | d mm | s mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-525 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| | **SPUN-120308** | 12,70 | 12,70 | 3,18 | 0,80 | 0,15-0,40 | 1,00-5,00 | 10 | 42920 | **8,50** |
| | **SPUN-120312** | 12,70 | 12,70 | 3,18 | 1,20 | 0,20-0,50 | 1,00-5,00 | 10 | 42921 | **8,50** |

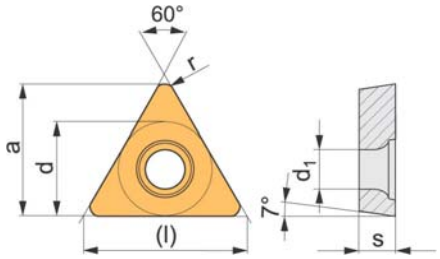
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8554 SPUN-120308 C-525**

**Porta Plaquitas** / Tool Holder
Porte-Plaquettes: **Pag. 552**

# Ref. 8558

## PLAQUITA INTERCAMBIABLE TORNEADO TCGT
TCGT Turning Indexable Insert
Plaquette tournage TCGT





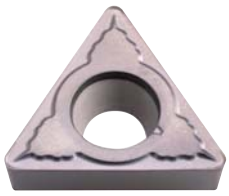

| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-010 | N° Art. P-710 | N° Art. P-720 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Aluminio** / **Aluminium** | | | | | | | | | | | | |
| **TCGT-110202-F-ZAL** | 11,00 | 6,35 | 2,38 | 2,80 | 0,20 | 0,07-0,15 | 0,05-4,00 | 10 | 18177 | 18172 | | **12,20** |
| **TCGT-110204-F-ZAL** | 11,00 | 6,35 | 2,38 | 2,80 | 0,40 | 0,10-0,20 | 0,10-4,00 | 10 | 18345 | | | **12,20** |
| **TCGT-16T304-F-ZAL** | 16,50 | 9,52 | 3,97 | 4,40 | 0,40 | 0,10-0,20 | 0,10-5,50 | 10 | 18388 | 18351 | | **15,49** |
| **TCGT-16T308-F-ZAL** | 16,50 | 9,52 | 3,97 | 4,40 | 0,80 | 0,15-0,50 | 0,10-5,50 | 10 | 18400 | 18391 | | **15,49** |
| **INOX** / **Stainless** / Inox | | | | | | | | | | | | |
| **TCGT-110204-E-ZNF** | 11,00 | 6,35 | 2,38 | 2,80 | 0,40 | 0,10-0,20 | 0,10-4,00 | 10 | | | 18318 | **12,20** |

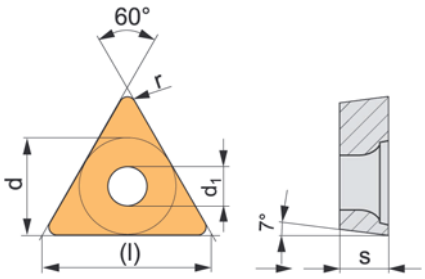
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8558 TCGT-110202-F-ZAL P-010**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 563, 570, 623**

# Ref. 8560

## PLAQUITA INTERCAMBIABLE TORNEADO TCMT
TCMT Turning Indexable Insert
Plaquette tournage TCMT





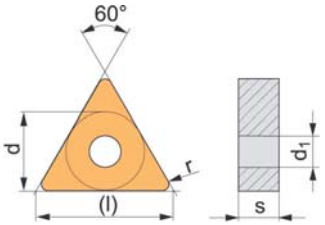

| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G25 | N° Art. P-H20 P-720 | N° Art. P-Cermet | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Acabado / Finishing /** Finition | | | | | | | | | | | | |
| **TCMT-090204-E-ZMM** | 9,63 | 5,56 | 2,38 | 2,50 | 0,40 | 0,05-0,19 | 0,10-1,70 | 10 | | 77228 | | **8,50** |
| **TCMT-110202-E-ZMM** | 11,00 | 6,35 | 2,38 | 2,80 | 0,20 | 0,03-0,13 | 0,06-1,70 | 10 | | 26317 | | **8,50** |
| **TCMT-110204-E-ZMM** | 11,00 | 6,35 | 2,38 | 2,80 | 0,40 | 0,05-0,19 | 0,10-1,70 | 10 | | 26320 | | **8,50** |
| **TCMT-16T304-E-ZMM** | 16,50 | 9,52 | 3,97 | 4,40 | 0,40 | 0,06-0,23 | 0,11-2,00 | 10 | | 26322 | | **8,86** |
| **Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | | | | |
| **TCMT-16T304-E-ZRR** | 16,50 | 9,52 | 3,97 | 4,40 | 0,40 | 0,08-0,25 | 0,25-3,00 | 10 | 23957 | | | **8,86** |
| **TCMT-16T308-E-ZRR** | 16,50 | 9,52 | 3,97 | 4,40 | 0,80 | 0,10-0,45 | 0,50-3,00 | 10 | 26323 | 10778 | | **8,86** |
| **Semi-Acabado / Semi-Finishing /** Semi-Finition | | | | | | | | | | | | |
| **TCMT-16T308-ZMCE** | 16,50 | 9,52 | 3,97 | 4,40 | 0,80 | 0,10-0,40 | 0,30-3,00 | 10 | | | 20029 | **13,88** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8560 TCMT-110202-E-ZMM P-H20**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 563, 570, 623**

# Ref. 8570

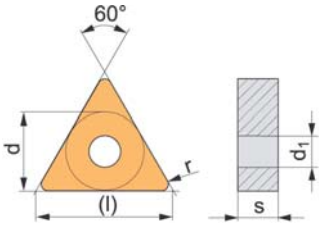
## PLAQUITA INTERCAMBIABLE TORNEADO TNMG
TNMG Turning Indexable Insert
Plaquette tournage TNMG




| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G15 C-515 | N° Art. C-G25 C-525 | N° Art. C-G40 C-540 | N° Art. P-625 | N° Art. P-720 | N° Art. P-Cermet | N° Art. P-010 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Acabado / Finishing /** Finition | | | | | | | | | | | | | | | | |
| **TNMG-160404-E-ZFM** | 16,50 | 9,52 | 4,76 | 3,81 | 0,40 | 0,05-0,25 | 0,10-1,50 | 10 | 18811 | 26325 | | 18812 | | | | **9,60** |
| **TNMG-160408-E-ZFM** | 16,50 | 9,52 | 4,76 | 3,81 | 0,80 | 0,10-0,40 | 0,10-1,50 | 10 | 42922 | 42924 | | | | | | **9,60** |
| **Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | | | | | | | | |
| **TNMG-160404-E-ZM** | 16,50 | 9,52 | 4,76 | 3,81 | 0,40 | 0,10-0,30 | 0,40-5,00 | 10 | 42925 | 42927 | | | | | | **9,60** |
| **TNMG-160408-E-ZM** | 16,50 | 9,52 | 4,76 | 3,81 | 0,80 | 0,15-0,40 | 0,50-5,00 | 10 | 18924 | 26326 | 19006 | | | | | **9,60** |
| **TNMG-160412-E-ZM** | 16,50 | 9,52 | 4,76 | 3,81 | 1,20 | 0,18-0,60 | 0,80-5,00 | 10 | | 26327 | 19195 | | | | | **9,60** |
| **TNMG-220408-E-ZM** | 22,00 | 12,70 | 4,76 | 5,16 | 0,80 | 0,15-0,50 | 0,50-6,50 | 10 | 42928 | 42929 | | | | | | **14,02** |
| **TNMG-220412-E-ZM** | 22,00 | 12,70 | 4,76 | 5,16 | 1,20 | 0,18-0,60 | 0,80-6,60 | 10 | 42930 | 42931 | | | | | | **14,02** |
| **Desbaste / Roughing /** Ébauche | | | | | | | | | | | | | | | | |
| **TNMG-160408-E-ZR** | 16,50 | 9,52 | 4,76 | 3,81 | 0,80 | 0,20-0,55 | 0,80-6,00 | 10 | 59284 | 59285 | | | | | | **9,60** |
| **TNMG-160412-E-ZR** | 16,50 | 9,52 | 4,76 | 3,81 | 1,20 | 0,18-0,60 | 0,80-5,00 | 10 | 59286 | 59287 | | | | | | **9,60** |
| **TNMG-220408-E-ZR** | 22,00 | 12,70 | 4,76 | 5,16 | 0,80 | 0,20-0,55 | 0,80-6,50 | 10 | 19213 | 26275 | 19215 | | | | | **14,02** |
| **TNMG-220412-E-ZR** | 22,00 | 12,70 | 4,76 | 5,16 | 1,20 | 0,25-0,70 | 1,00-7,00 | 10 | 19228 | 11272 | 10790 | | | | | **14,02** |
| **Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | | | | | | | | |
| **TNMG-160404-ER-ZSX** | 16,50 | 9,52 | 4,76 | 3,81 | 0,40 | 0,12-0,30 | 1,00-3,50 | 10 | | 11274 | | | | | | **9,60** |
| **TNMG-160408-ER-ZSX** | 16,50 | 9,52 | 4,76 | 3,81 | 0,80 | 0,15-0,50 | 1,30-3,50 | 10 | | 11277 | | | | | | **9,60** |
| **Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | | | | | | | | |
| **TNMG-160404-EL-ZSX** | 16,50 | 9,52 | 4,76 | 3,81 | 0,40 | 0,12-0,30 | 1,00-3,50 | 10 | | 11275 | | | | | | **9,60** |
| **TNMG-160408-EL-ZSX** | 16,50 | 9,52 | 4,76 | 3,81 | 0,80 | 0,15-0,50 | 1,30-3,50 | 10 | | 11278 | | | | | | **9,60** |
| **Acabado / Finishing /** Finition | | | | | | | | | | | | | | | | |
| **TNMG-160404-ZFCE** | 16,50 | 9,52 | 4,76 | 3,81 | 0,40 | 0,05-0,40 | 0,20-1,50 | 10 | | | | | | 20032 | | **13,69** |
| **Semi-Acabado / Semi-Finishing /** Semi-Finition | | | | | | | | | | | | | | | | |
| **TNMG-160408-ZMCE** | 16,50 | 9,52 | 4,76 | 3,81 | 0,80 | 0,10-0,40 | 0,30-3,00 | 10 | | | | | | 20033 | | **13,69** |
| **INOX Semi-Desbaste / Semi-Roughing Stainless /** INOX Semi-Ébauche | | | | | | | | | | | | | | | | |
| **TNMG-160404-E-ZNM** | 16,50 | 9,52 | 4,76 | 3,81 | 0,40 | 0,10-0,30 | 0,50-4,00 | 10 | | | | | 35207 | | | **9,60** |
| **TNMG-160408-E-ZNM** | 16,50 | 9,52 | 4,76 | 3,81 | 0,80 | 0,12-0,45 | 0,50-4,80 | 10 | | | | | 35209 | | | **9,60** |
| New! **ALUMINIUM Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | | | | | | | | |
| **TNMG-160404-ZAL** | 16,50 | 9,52 | 4,76 | 3,81 | 0,40 | 0,10-0,20 | 0,30-3,80 | 10 | | | | | | | 70118 | **9,60** |
| **TNMG-160408-ZAL** | 16,50 | 9,52 | 4,76 | 3,81 | 0,80 | 0,10-0,40 | 0,30-3,80 | 10 | | | | | | | 70124 | **9,60** |
| **TNMG-160412-ZAL** | 16,50 | 9,52 | 4,76 | 3,81 | 1,20 | 0,15-0,60 | 0,40-3,80 | 10 | | | | | | | 70136 | **9,60** |

# Ref. 8570

## PLAQUITA INTERCAMBIABLE TORNEADO TNMG
TNMG Turning Indexable Insert
Plaquette tournage TNMG



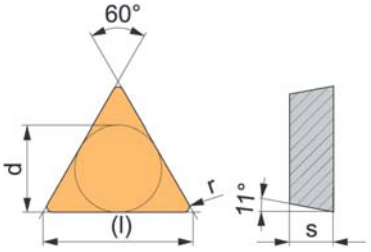

| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G15 | N° Art. C-G25 | N° Art. C-S15 | N° Art. C-S25 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Desbaste Alto Rendimiento / High Performance Semi-Roughing /** Semi-Ébauche Haut Rendement | | | | | | | | | | | | | |
| **TNMG-160404-ZPM** | 15,50 | 12,70 | 4,76 | 3,81 | 0,40 | 0,15-0,50 | 0,50-6,00 | 10 | 71291 | 71292 | | | **10,56** |
| **TNMG-160408-ZPM** | 15,50 | 12,70 | 4,76 | 3,81 | 0,80 | 0,15-0,50 | 0,50-6,00 | 10 | 71293 | 71294 | | | **10,56** |
| **TNMG-160412-ZPM** | 15,50 | 12,70 | 6,35 | 3,81 | 1,20 | 0,15-0,50 | 0,50-6,00 | 10 | 71295 | 71296 | | | **10,56** |
| **TNMG-220408-ZPM** | 22,00 | 12,70 | 4,76 | 5,16 | 0,80 | 0,20-0,55 | 0,80-6,50 | 10 | 17073 | 62421 | | | **15,20** |
| **TNMG-220412-ZPM** | 22,00 | 12,70 | 4,76 | 5,16 | 1,20 | 0,25-0,70 | 1,00-7,00 | 10 | 17074 | 17085 | | | **15,20** |
| **INOX Acabado Alto Rendimiento/ High Performance Finishing Stainless /** INOX Finition Haut Rendement | | | | | | | | | | | | | |
| **TNMG-160404-ZNF** | 16,50 | 9,52 | 4,76 | 3,81 | 0,40 | 0,10-0,30 | 0,50-4,00 | 10 | | | 16992 | 77508 | **10,56** |
| **TNMG-160408-ZNF** | 16,50 | 9,52 | 4,76 | 3,81 | 0,80 | 0,12-0,45 | 0,50-4,80 | 10 | | | 81956 | 77509 | **10,56** |
| **TNMG-160412-ZNF** | 16,50 | 9,52 | 4,76 | 3,81 | 1,20 | 0,18-0,60 | 0,80-5,00 | 10 | | | 16993 | 17019 | **10,56** |
| **TNMG-220404-ZNF** | 22,00 | 12,70 | 4,76 | 5,16 | 0,40 | 0,12-0,40 | 0,40-6,00 | 10 | | | 82749 | 17027 | **15,20** |
| **TNMG-220408-ZNF** | 22,00 | 12,70 | 4,76 | 5,16 | 0,80 | 0,20-0,55 | 0,80-6,50 | 10 | | | 17038 | 17042 | **15,20** |
| **TNMG-220412-ZNF** | 22,00 | 12,70 | 4,76 | 5,16 | 1,20 | 0,25-0,70 | 1,00-7,00 | 10 | | | 17052 | 17068 | **15,20** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8570 TNMG-160404-E-ZFM C-G15**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 556, 565**

# Ref. 8571

## PLAQUITA INTERCAMBIABLE TORNEADO TPMR
TPMR Turning Indexable Insert
Plaquette tournage TPMR



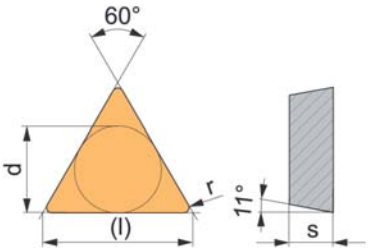

| ISO | **Dimensiones** Dimensions l mm | d mm | s mm | r mm | **Condiciones Corte** Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-515 | N° Art. C-525 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **Acabado / Finishing /** Finition | | | | | | | | | | |
| **TPMR-160304-E-Z7** | 16,50 | 9,52 | 3,18 | 0,40 | 0,08-0,20 | 0,50-2,00 | 10 | 29914 | 13406 | **8,50** |
| **TPMR-160308-E-Z7** | 16,50 | 9,52 | 3,18 | 0,80 | 0,08-0,35 | 0,50-3,00 | 10 | 29915 | 13408 | **8,50** |
| **TPMR-160312-E-Z7** | 16,50 | 9,52 | 3,18 | 1,20 | 0,08-0,55 | 0,50-3,00 | 10 | 29917 | 13411 | **8,50** |
| **Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | | |
| **TPMR-160308-E-Z1** | 16,50 | 9,52 | 3,18 | 0,80 | 0,13-0,40 | 1,00-5,00 | 10 | 29919 | 13414 | **8,50** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8571 TPMR-160304-E-Z7 C-525**

**Porta Plaquitas** / Tool Holder
Porte-Plaquettes: **Pag. 553, 564**

# Ref. 8572

## PLAQUITA INTERCAMBIABLE TORNEADO TPUN
TPUN Turning Indexable Insert
Plaquette tournage TPUN



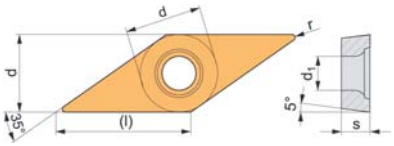

| ISO | **Dimensiones** Dimensions l mm | d mm | s mm | r mm | **Condiciones Corte** Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-525 | N° Art. P-620 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **Acabado/Semi-Desbaste/Desbaste - Finishing/Semi-Roughing/Roughing-** Finition/Semi-Ébauche/Ébauche | | | | | | | | | | |
| **TPUN-160304** | 16,50 | 9,52 | 3,18 | 0,40 | 0,10-0,30 | 1,00-5,00 | 10 | 11291 | 29930 | **9,23** |
| **TPUN-160308** | 16,50 | 9,52 | 3,18 | 0,80 | 0,15-0,40 | 1,00-5,00 | 10 | 11292 | 29933 | **9,23** |
| **TPUN-220408** | 22,00 | 12,70 | 4,76 | 0,80 | 0,15-0,40 | 1,50-7,00 | 10 | 11293 | 29935 | **12,55** |
| **TPUN-220412** | 22,00 | 12,70 | 4,76 | 1,20 | 0,20-0,50 | 1,50-7,00 | 10 | 11295 | 29937 | **12,55** |

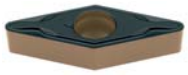
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8572 TPUN-160304 C-525**

**Porta Plaquitas** / Tool Holder
Porte-Plaquettes: **Pag. 553, 564**

# Ref. 8575

## PLAQUITA INTERCAMBIABLE TORNEADO VBMT
VBMT Turning Indexable Insert
Plaquette tournage VBMT



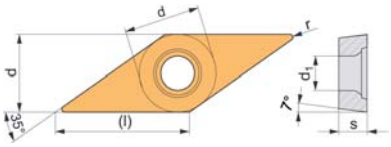
| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G25 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **Acabado/Semi-Acabado - Finishing/Semi-Finishing -** Finition/Semi-Finition | | | | | | | | | | |
| **VBMT-110304-E-ZRR** | 11,10 | 6,35 | 3,18 | 2,80 | 0,40 | 0,05-0,19 | 0,10-1,70 | 10 | 11284 | **11,43** |
| **VBMT-110308-E-ZRR** | 11,10 | 6,35 | 3,18 | 2,80 | 0,80 | 0,05-0,19 | 0,10-1,70 | 10 | 11286 | **11,43** |
| **VBMT-160404-E-ZRR** | 16,60 | 9,52 | 4,76 | 4,40 | 0,40 | 0,05-0,20 | 0,10-1,80 | 10 | 11288 | **16,22** |
| **VBMT-160408-E-ZRR** | 16,60 | 9,52 | 4,76 | 4,40 | 0,80 | 0,07-0,27 | 0,14-1,80 | 10 | 11289 | **16,22** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8575 VBMT-1103-04-E-ZRR C-G25**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 563**

# Ref. 8576

## PLAQUITA INTERCAMBIABLE TORNEADO VCGT
VCGT Turning Indexable Insert
Plaquette tournage VCGT



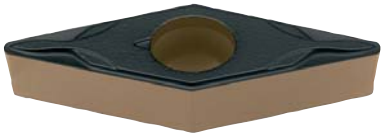
| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-010 | N° Art. P-710 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Acabado / Semi-Finishing /** Semi-Finition | | | | | | | | | | | |
| **VCGT-110302-F-ZAL** | 11,10 | 6,35 | 3,18 | 2,80 | 0,20 | 0,05-0,12 | 0,05-3,00 | 10 | 78838 | | **15,73** |
| **VCGT-110304-F-ZAL** | 11,10 | 6,35 | 3,18 | 2,80 | 0,40 | 0,10-0,25 | 0,05-3,00 | 10 | 29870 | | **15,73** |
| **VCGT-110308-F-ZAL** | 11,10 | 6,35 | 3,18 | 2,80 | 0,80 | 0,15-0,45 | 0,05-3,00 | 10 | 78839 | | **15,73** |
| **VCGT-160404-F-ZAL** | 16,60 | 9,52 | 4,76 | 4,40 | 0,40 | 0,10-0,25 | 0,10-5,00 | 10 | 71115 | 78840 | **18,08** |
| **VCGT-160408-F-ZAL** | 16,60 | 9,52 | 4,76 | 4,40 | 0,80 | 0,15-0,45 | 0,10-5,00 | 10 | 78841 | | **18,08** |
| **INOX** / Stainless / Inox | | | | | | | | | | | |
| **VCGT-110302-E-ZNF** | 11,10 | 6,35 | 3,18 | 2,80 | 0,20 | 0,05-0,12 | 0,05-3,00 | 10 | | 81513 | **15,73** |
| **VCGT-110304-E-ZNF** | 11,10 | 6,35 | 3,18 | 2,80 | 0,40 | 0,10-0,25 | 0,05-3,00 | 10 | | 81514 | **15,73** |

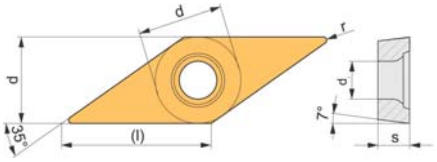
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8576 VCGT-110302-F-ZAL P-010**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 564, 570**

# Ref. 8577

## PLAQUITA INTERCAMBIABLE TORNEADO VCMT
VCMT Turning Indexable Insert
Plaquette tournage VCMT





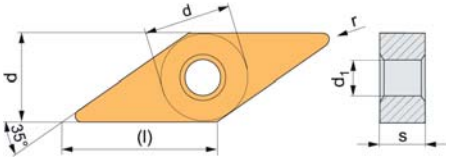

| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G15 | N° Art. C-G25 | N° Art. P-720 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Acabado / Finishing /** Finition | | | | | | | | | | | | |
| **VCMT-110304-E-ZMM** | 11,10 | 6,35 | 3,18 | 2,80 | 0,40 | 0,05-0,20 | 0,10-1,50 | 10 | | 19317 | 19325 | **12,02** |
| **VCMT-110308-E-ZMM** | 11,10 | 6,35 | 3,18 | 2,80 | 0,80 | 0,13-0,33 | 0,60-2,55 | 10 | | 19334 | 19348 | **12,02** |
| **VCMT-160404-E-ZMM** | 16,60 | 9,52 | 4,76 | 4,40 | 0,40 | 0,05-0,20 | 0,10-1,80 | 10 | 81646 | 19359 | 19372 | **15,51** |
| **VCMT-160408-E-ZMM** | 16,60 | 9,52 | 4,76 | 4,40 | 0,80 | 0,07-0,27 | 0,14-1,80 | 10 | 17086 | 19373 | 19378 | **15,51** |
| **Semidesbaste / Semiroughing /** Semiébauche | | | | | | | | | | | | |
| **VCMT-160404-E-ZRR** | 16,60 | 9,52 | 4,76 | 4,40 | 0,40 | 0,07-0,20 | 0,20-2,70 | 10 | | 18873 | | **15,51** |
| **VCMT-160408-E-ZRR** | 16,60 | 9,52 | 4,76 | 4,40 | 0,80 | 0,09-0,27 | 0,50-2,70 | 10 | | 19345 | | **15,51** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8577 VCMT-110304-E-ZMM C-G25**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 564, 570**

# Ref. 8578

## PLAQUITA INTERCAMBIABLE TORNEADO VNMG
VNMG Turning Indexable Insert
Plaquette tournage VNMG



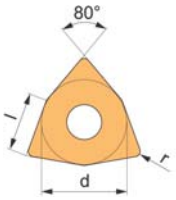

| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G15 | N° Art. C-G25 | N° Art. C-S15 | N° Art. C-S25 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Acabado / Finishing /** Finition | | | | | | | | | | | | | |
| **VNMG-160404-E-ZFM** | 16,50 | 9,52 | 4,76 | 3,81 | 0,40 | 0,05-0,25 | 0,10-1,50 | 10 | 29938 | 29939 | | | **13,68** |
| **VNMG-160408-E-ZFM** | 16,50 | 9,52 | 4,76 | 3,81 | 0,80 | 0,10-0,40 | 0,10-1,50 | 10 | 29940 | 29941 | | | **13,68** |
| **VNMG-160412-E-ZFM** | 16,50 | 9,52 | 4,76 | 3,81 | 1,20 | 0,15-0,60 | 1,20-3,00 | 10 | 29942 | 29944 | | | **13,68** |
| **INOX Acabado Alto Rendimiento / High Performance Finishing Stainless /** INOX Finition Haut Rendement | | | | | | | | | | | | | |
| **VNMG-160404-ZNF** | 16,50 | 9,52 | 4,76 | 3,81 | 0,40 | 0,05-0,25 | 0,10-1,50 | 10 | | | 17092 | 17096 | **14,27** |
| **VNMG-160408-ZNF** | 16,50 | 9,52 | 4,76 | 3,81 | 0,80 | 0,10-0,40 | 0,10-1,50 | 10 | | | 17100 | 17102 | **14,27** |
| **VNMG-160412-ZNF** | 16,50 | 9,52 | 4,76 | 3,81 | 1,20 | 0,15-0,60 | 1,20-3,00 | 10 | | | 17107 | 17108 | **14,27** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8578 VNMG-160404-E-ZFM C-G15**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 556, 566**

# Ref. 8580

## PLAQUITA INTERCAMBIABLE TORNEADO WNMG
WNMG Turning Indexable Insert
Plaquette tournage WNMG



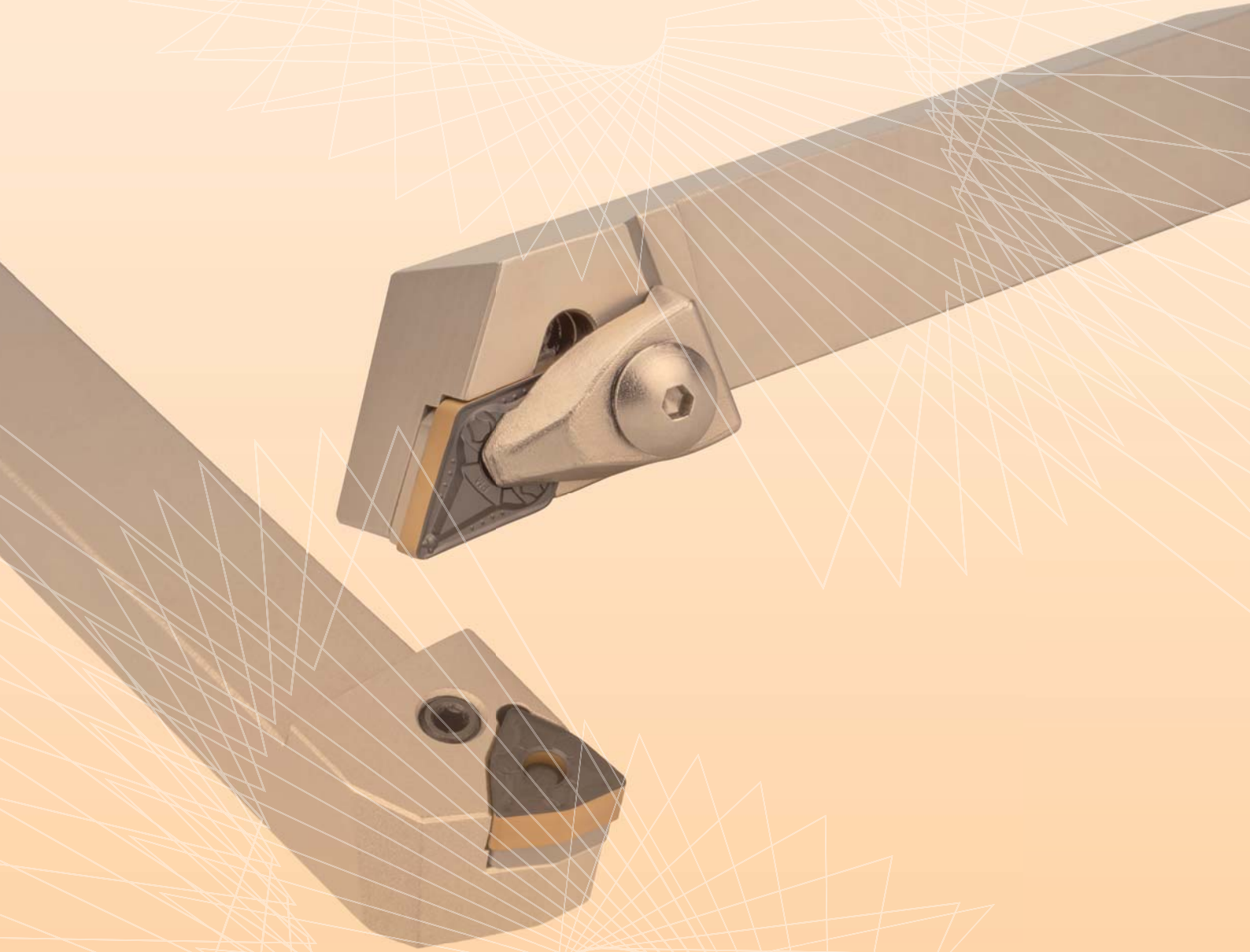

| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G15 C-515 | N° Art. C-G25 C-525 | N° Art. C-G40 | N° Art. P-720 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Wiper** | | | | | | | | | | | | | |
| **WNMG-060408-E-ZWM** | 6,50 | 9,52 | 4,76 | 3,81 | 0,80 | 0,15-0,60 | 0,50-3,50 | 10 | | 19401 | | | **9,60** |
| **WNMG-060412-E-ZWM** | 6,50 | 9,52 | 4,76 | 3,81 | 1,20 | 0,20-0,90 | 0,80-3,50 | 10 | | 19402 | | | **9,60** |
| **WNMG-080408-E-ZWM** | 8,70 | 12,70 | 4,76 | 5,16 | 0,80 | 0,15-0,60 | 0,50-5,00 | 10 | | 19404 | | | **11,81** |
| **Acabado / Finishing /** Finition | | | | | | | | | | | | | |
| **WNMG-080404-E-ZF** | 8,70 | 12,70 | 4,76 | 5,16 | 0,40 | 0,05-0,30 | 0,10-2,00 | 10 | 19383 | 26331 | | | **11,08** |
| **WNMG-080408-E-ZF** | 8,70 | 12,70 | 4,76 | 5,16 | 0,80 | 0,10-0,40 | 0,10-2,00 | 10 | | 30519 | | | **11,08** |
| **Semi-Desbaste / Semi-Roughing /** Semi-Ébauche | | | | | | | | | | | | | |
| **WNMG-060404-E-ZM** | 6,50 | 9,52 | 4,76 | 3,81 | 0,40 | 0,10-0,30 | 0,50-3,00 | 10 | | 42933 | | | **8,86** |
| **WNMG-060408-E-ZM** | 6,50 | 9,52 | 4,76 | 3,81 | 0,80 | 0,15-0,50 | 0,50-3,00 | 10 | 19386 | 26328 | | | **8,86** |
| **WNMG-080408-E-ZFM** | 8,70 | 12,70 | 4,76 | 5,16 | 0,80 | 0,20-0,40 | 0,70-4,00 | 10 | 42934 | | | 42935 | **11,08** |
| **WNMG-080408-E-ZM** | 8,70 | 12,70 | 4,76 | 5,16 | 0,80 | 0,15-0,40 | 0,50-4,00 | 10 | 19389 | 26332 | 19392 | | **11,08** |
| **WNMG-080412-E-ZM** | 8,70 | 12,70 | 4,76 | 5,16 | 1,20 | 0,18-0,60 | 0,80-4,00 | 10 | | 26333 | | | **11,08** |
| **Desbaste / Roughing /** Ébauche | | | | | | | | | | | | | |
| **WNMG-080408-E-ZR** | 8,70 | 12,70 | 4,76 | 5,16 | 0,80 | 0,20-0,55 | 0,80-5,00 | 10 | 13854 | 11281 | 19396 | | **11,08** |
| **WNMG-080412-E-ZR** | 8,70 | 12,70 | 4,76 | 5,16 | 1,20 | 0,25-0,70 | 1,50-5,00 | 10 | 13855 | 11280 | 19398 | | **11,08** |
| **INOX / Stainless /** INOX | | | | | | | | | | | | | |
| **WNMG-080404-E-ZNM** | 8,70 | 12,70 | 4,76 | 5,16 | 0,40 | 0,12-0,30 | 0,50-3,00 | 10 | | | | 35210 | **11,08** |
| **WNMG-080408-E-ZNM** | 8,70 | 12,70 | 4,76 | 5,16 | 0,80 | 0,20-0,40 | 0,70-4,00 | 10 | | | | 35211 | **11,08** |

| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-G15 | N° Art. C-G25 | N° Art. C-S15 | N° Art. C-S25 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Desbaste Alto Rendimiento / High Performance Semi-Roughing /** Semi-Ébauche Haut Rendement | | | | | | | | | | | | | |
| **WNMG-080404-ZPM** | 8,70 | 12,70 | 4,76 | 5,16 | 0,40 | 0,20-0,40 | 0,50-4,00 | 10 | 71298 | 71299 | | | **12,18** |
| **WNMG-080408-ZPM** | 8,70 | 12,70 | 4,76 | 5,16 | 0,80 | 0,20-0,40 | 0,50-4,00 | 10 | 71300 | 71301 | | | **12,18** |
| **WNMG-080412-ZPM** | 8,70 | 12,70 | 4,76 | 5,16 | 1,20 | 0,18-0,60 | 0,80-4,00 | 10 | 71302 | 71303 | | | **12,18** |
| **INOX Acabado Alto Rendimiento / High Performance Finishing Stainless /** INOX Finition Haut Rendement | | | | | | | | | | | | | |
| **WNMG-060404-ZNF** | 6,50 | 9,52 | 4,76 | 3,81 | 0,40 | 0,10-0,30 | 0,50-3,00 | 10 | | | 17120 | 17122 | **9,87** |
| **WNMG-060408-ZNF** | 6,50 | 9,52 | 4,76 | 3,81 | 0,80 | 0,15-0,50 | 0,50-3,00 | 10 | | | 17125 | 17126 | **9,87** |
| **WNMG-060412-ZNF** | 6,50 | 9,52 | 4,76 | 3,81 | 1,20 | 0,20-0,90 | 0,80-3,50 | 10 | | | 81332 | 81333 | **9,87** |
| **WNMG-080404-ZNF** | 8,70 | 12,70 | 4,76 | 5,16 | 0,40 | 0,20-0,40 | 0,50-4,00 | 10 | | | 17127 | 17132 | **12,18** |
| **WNMG-080408-ZNF** | 8,70 | 12,70 | 4,76 | 5,16 | 0,80 | 0,20-0,40 | 0,50-4,00 | 10 | | | 79345 | 17137 | **12,18** |
| **WNMG-080412-ZNF** | 8,70 | 12,70 | 4,76 | 5,16 | 1,20 | 0,18-0,60 | 0,80-4,00 | 10 | | | 17140 | 17141 | **12,18** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8580 WNMG-060408-E-ZWM C-G25**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 555, 557, 567**

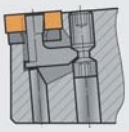
# PORTA-PLAQUITAS TORNEADO
## Turning Tool-Holders
## Porte-Plaquettes tournage



# ELECCIÓN PORTA-PLAQUITAS TORNEADO
Turning Tool-Holder Choice
Choix Porte-Plaquettes tournage

## SISTEMAS ANCLAJE - Clamping Systems - Systèmes fixation

### ISO P

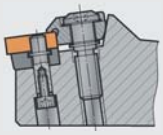


**Anclaje para plaquitas negativas con agujero en torneado exterior (acabado o desbaste). Alternativa en torneado interior de agujeros de grandes diámetros**

Clamping for negative hole-inserts in external turning (finishing or roughing). Alternate for large diameters holes internal turning

Fixation pour plaquettes négatives avec trou sur tournage extérieur (finition ou ébauche). Option pour tournage intérieur trous de grands diamètres

### ISO M (D)



**Para mismo tipo de plaquitas que el ISO-P. Usado sobre todo en portas con carga dinámica elevada para torneado exterior**

For the same insert-type as ISO-P. Used mainly in enhanced dynamic load holders for external turning

Mêmes plaquettes que l´ISO-P. Employées sur Porteplaquettes avec charge dinamique pour tournage extérieur

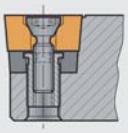
### ISO C

**Para plaquitas positivas o negativas sin agujero, con o sin rompevirutas y para torneado interior o exterior**

For positive or negative inserts without hole, with or without chipbreakers and for internal or external turning

Pour plaquettes positives où negatives sans trou, avec ou sans brisecopeaux pour tournage intérieur ou extérieur

### ISO S

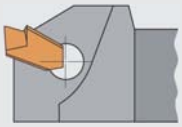


**Para portas con cuadradillo pequeño usados en torneado interior o exterior. Con esta solución se evitan obstáculos para evacuar la viruta**

For small cross-section holders, used in external or internal turning. Convenient solution as there is no obstacle for chip flow

Pour portes plaquettes avec cage petite employées en tournage intérieur où extérieur. Avec cette solution, on supprime les obstacles pour évacuer les copeaux

### ISO X

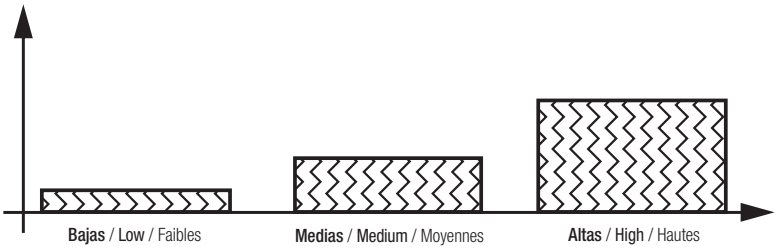


**Marca que identifica portas con sistema de anclaje especial (diferente segun el fabricante). Para tronzado y ranurado**

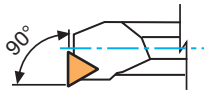
Marking that identifies an special clamping-system (different depending on the manufacturer). For parting & grooving

Marque qui identifie porteplaquettes avec système de fixation spécial (différent selon le fabricant). Pour tronzage et rainurage

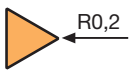
## BARRAS MANDRINAR
**Boring Bars**
Barreaux mandrins




1. **Seleccionar un Angulo de Posición aproximado a 90° con un Radio de Punta pequeño.**

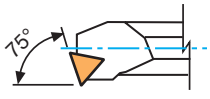



1. Select a **Position Angle** aproximately at **90° with a small Nose Radius.**

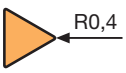



1. **Selectionner l´angle de position aproximatif à 90° avec un rayon petit de la pointe.**

2. **Nunca** seleccionar un Angulo de Posición **menor de 75°**

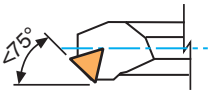



2. **Never** select a Position Angle **smaller than 75°**

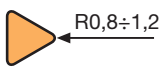



2. **Jamais** selectionner un angle de position **inférieur à 75°**

3. A **mayor Radio** en la Punta **mayor Vibracion**




3. **Bigger** Nose **Radius** = **more Vibration**




3. **A plus grand Rayon** sur la Pointe = **plus de Vibrations**

**Seleccionar Herramientas y Plaquitas positivas.**

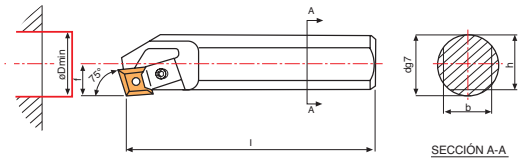
**Dm/mm = Tener en cuenta el diámetro menor del agujero para que la herramienta no roce contra el material a trabajar.**

Select **Positive Tools & Inserts.**

Dm/mm = Have in mind the **hole minor diameter** in order the tool not to touch the working material.

Selectionner **outils et plaquettes positives.**

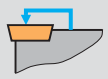
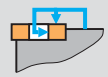
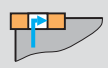
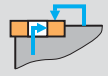
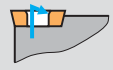
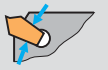
Dm/mm = Prendre en considération **le diamètre inférieur du trou** pour que le trou ne touche pas le matériel à usiner.




| | d mm | f mm | l mm | $D_{min}$ mm |
|---|---|---|---|---|
| CNMG 1204... | 25 | 17 | 250 | 32 |
| | 25 | 17 | 250 | 32 |
| | 32 | 22 | 300 | 40 |
| | 32 | 22 | 300 | 40 |

# CÓDIGOS ISO ELECCIÓN PORTA-PLAQUITAS TORNEADO EXTERIOR
External Turning Tool-Holder Choice ISO Codes
Codes ISO choix Porte-Plaquettes tournage extérieur

## 1
Designación Amarre
Clamping Designation
Type attachement

| | |
|---|---|
| C |  |
| D |  |
| P |  |
| M |  |
| S |  |
| X |  |
| G | |

## 2
Forma Plaquita
Insert Shape
Forme plaquette

| | |
|---|---|
| S | C 80° |
| T | D 55° |
| R | K 55° |
| W 80° | V 35° |
| L | |

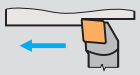
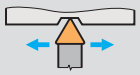
## 3
Tipo Herramienta - Ángulo Filo Corte
Tool Style - Cutting Edge Angle
Type outil - Angle arête de coupe

| | | | | |
|---|---|---|---|---|
| A 90° | B 75° | C 90° | D 45° | D |
| E 60° | F 90° | G 90° | H 107°30´ | J 93° |
| K 75° | L 95° | M 50° | N 62°30´ | P 117°30´ |
| Q 107°30´ | R 75° | S 45° | S | T 60° |
| U 93° | V 72°30´ | W 60° | | Y 85° |
| Z | | | | |

## 4
Angulo Incidencia
Clearance Angle
Angle d'incidence

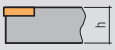
| N | C | P |
|---|---|---|
| $\alpha_n$=0° | $\alpha_n$=7° | $\alpha_n$=11° |

## 5
Dirección Corte
Direction of Cut
Direction coupe

| | |
|---|---|
| R |  |
| L | |
| N |  |

| 1 | 2 | 3 | 4 | 5 | | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| P | C | L | N | R | - | 32 | 25 | L | 12 |

## 6
Altura Mango (mm)
Shank Height (mm)
Hauteur queue (mm)



| | | | | | |
|---|---|---|---|---|---|
| 08 | 10 | 12 | 16 | 20 | 25 |
| 32 | 38 | 40 | 45 | 50 | |

## 7
Ancho Mango (mm)
Shank Width (mm)
Epaisseur queue (mm)

| | | | | | |
|---|---|---|---|---|---|
| 08 | 10 | 12 | 16 | 20 | 25 |
| 32 | 38 | 40 | 45 | 50 | |

## 8
Longitud Total
Total Lenght
Longueur totale

| | $l_1$ [mm] |
|---|---|
| D | 60 |
| E | 70 |
| F | 80 |
| H | 100 |
| J | 110 |
| K | 125 |
| L | 140 |
| M | 150 |
| N | 160 |
| P | 170 |
| Q | 180 |
| R | 200 |
| S | 250 |
| T | 300 |
| U | 350 |
| V | 400 |
| W | 450 |
| X | Spec. |
| Y | 500 |

## 9
Longitud Filo Corte
Cutting Edge Length
Longueur arête coupe

| d [mm] | S | C | D | V | K | W | T | R |
|---|---|---|---|---|---|---|---|---|
| 6,00 | | | | | | | | 06 |
| 6,35 | | 06 | 07 | 11 | | | 11 | |
| 8,00 | | | | | | | | 08 |
| 9,525 | 09 | 09 | 11 | 16 | 19 | 06 | 16 | |
| 10,00 | | | | | | | | 10 |
| 12,00 | | | | | | | | 12 |
| 12,70 | 12 | 12 | 15 | | | 08 | 22 | 12 |
| 15,875 | 15 | 16 | | | | | 27 | 15 |
| 16,00 | | | | | | | | 16 |
| 19,05 | 19 | 19 | | | | | | 19 |
| 20,00 | | | | | | | | 20 |
| 25,00 | | | | | | | | 25 |
| 25,40 | 25 | 25 | | | | | | 25 |

# CÓDIGOS ISO ELECCIÓN PORTA-PLAQUITAS TORNEADO INTERIOR
Internal Turning Tool-Holder Choice ISO Codes
Codes ISO choix Porte-Plaquettes tournage intérieur

**1**
Mango
Shank
Queue

| | |
|---|---|
| S | Mango Acero<br>Steel Shank<br>Queue acier |
| A | Mango Acero Agujero Refrigeración<br>Steel Shank with Coolant Hole<br>Queue acier lubrification interne |

**2**
Mango Ø (mm)
Shank Ø (mm)
Queue Ø (mm)

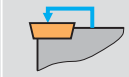
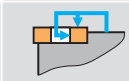
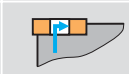
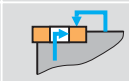
| | | | | |
|---|---|---|---|---|
| 08 | 10 | 12 | 16 | 20 |
| 25 | 32 | 40 | 50 | 60 |

| 1 | 2 | 3 | | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| A | 40 | T | - | P | C | L | N | L | 12 |

**3**
Longitud Total
Total Length
Longueur totale

| | $l_1$ [mm] |
|---|---|
| D | 60 |
| E | 70 |
| F | 80 |
| H | 100 |
| J | 110 |
| K | 125 |
| L | 140 |
| M | 150 |
| N | 160 |
| P | 170 |
| Q | 180 |
| R | 200 |
| S | 250 |
| T | 300 |
| U | 350 |
| V | 400 |
| W | 450 |
| X | Spec. |
| Y | 500 |

**4**
Designación Amarre
Clamping Designation
Type attachement

| | |
|---|---|
| C |  |
| D |  |
| P |  |
| M |  |
| S | |
| X | |
| G | |

**5**
Forma Plaquita
Insert Shape
Forme plaquette

| | |
|---|---|
| S | C 80° |
| T | D 55° |
| R | K 55° |
| W 80° | V 35° |
| L | |

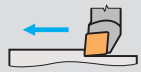
**6**
Tipo Herramienta - Ángulo Filo Corte
Tool Style - Cutting Edge Angle
Type outil - Angle arête de coupe

| | | | | |
|---|---|---|---|---|
| A 90° | B 75° | C 90° | D 45° | D |
| E 60° | F 90° | G 90° | H 107°30´ | J 93° |
| K 75° | L 95° | M 50° | N 62°30´ | P 117°30´ |
| Q 107°30´ | R 75° | S 45° | S | T 60° |
| U 93° | V 72°30´ | W 60° | | Y 85° |
| Z | | | | |

**7**
Angulo Incidencia
Clearance Angle
Angle d'incidence

| N | C | P |
|---|---|---|
| $\alpha_n$=0° | $\alpha_n$=7° | $\alpha_n$=11° |

**8**
Dirección Corte
Direction of Cut
Direction coupe

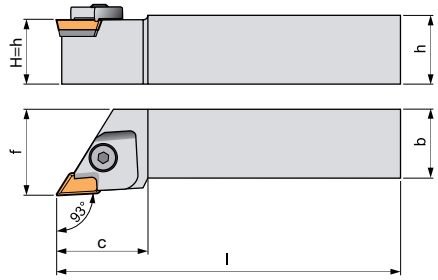
| | |
|---|---|
| R | |
| L |  |

**9**
Longitud Filo de Corte
Cutting Edge Length
Longueur arête coupe

| d [mm] | S | C | D | V | K | W | T | R |
|---|---|---|---|---|---|---|---|---|
| 6,00 | | | | | | | | 06 |
| 6,35 | | 06 | 07 | 11 | | | 11 | |
| 8,00 | | | | | | | | 08 |
| 9,525 | 09 | 09 | 11 | 16 | 19 | 06 | 16 | |
| 10,00 | | | | | | | | 10 |
| 12,00 | | | | | | | | 12 |
| 12,70 | 12 | 12 | 15 | | | 08 | 22 | 12 |
| 15,875 | 15 | 16 | | | | | 27 | 15 |
| 16,00 | | | | | | | | 16 |
| 19,05 | 19 | 19 | | | | | | 19 |
| 20,00 | | | | | | | | 20 |
| 25,00 | | | | | | | | 25 |
| 25,40 | 25 | 25 | | | | | | 25 |

# Ref. 8726

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS NEGATIVAS CKJN-93°
CKJN-93° Negative Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes negatives CKJN-93°



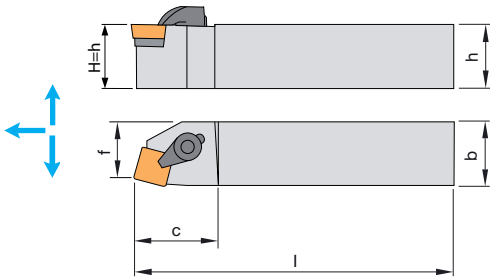

| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | | Ref. 8814 | | Ref. 8812 | | Ref. 8816 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CKJNR-2525M16 | ● | 13517 | | | KNUX 1604.. | 25 | 25 | 150 | 34 | 32 | 171,43 | 9,25×14,5 Art. 13824 **12,15 €** | 5 | 3×10 Art. 10955 **1,36 €** | 5 | 23,5×2,5 Art. 13827 **14,06 €** | 1 | 4-W1/4x 25,5xø10 Art. 13832 **3,51 €** | 5 |
| CKJNL-2525M16 | | | ● | 13519 | | 25 | 25 | 150 | 34 | 32 | 171,43 | 9,25×14,5 Art. 13825 **12,15 €** | 5 | | | 2,5×23,5 Art. 13829 **14,06 €** | 1 | | |

**Plaquita** / Insert / Plaquette: **Pag. 537**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Pasador** - Pin - Goupille |
| | **Brida** - Clamp - Bride |
| | **Tornillo** - Screw - Vis |

# Ref. 8706

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS POSITIVAS CSBP.-75°
CSBP.-75° Positive Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes positives CSBP.-75°



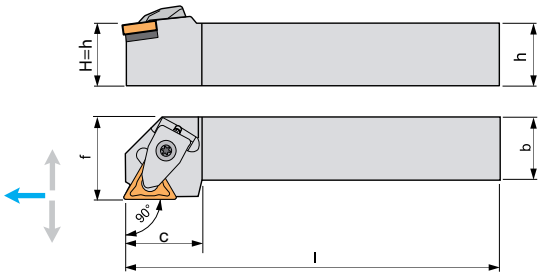

| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8814 | | Ref. 8812 | | Ref. 8815 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CSBPR-2020-K12 | ● | 42954 | | | SPUN 1203.. | 20 | 20 | 125 | 34 | 17 | 93,61 | 2,1×10 Art. 13826 **0,83 €** | 5 | M6×1 – 21×5 Art. 10945 **15,14 €** | 1 | CSB-PR-20-25 Art. 43592 **10,00 €** | 5 |
| CSBPL-2020-K12 | | | ● | 42955 | | 20 | 20 | 125 | 34 | 17 | 93,61 | | | | | | |
| CSBPR-2525-M12 | ● | 42957 | | | | 25 | 25 | 150 | 34 | 22 | 102,44 | | | | | | |
| CSBPL-2525-M12 | | | ● | 42958 | | 25 | 25 | 150 | 34 | 22 | 102,44 | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 540**

| | |
|---|---|
| | **Pasador** - Pin - Goupille |
| | **Brida** - Clamp - Bride |
| | **Placa Base** - Base Plate - Plaque de base |

# Ref. 8707

**PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS POSITIVAS CTGP.-90°**
CTGP.-90° Positive Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes positives CTGP.-90°




| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | | Ref. 8814 | | Ref. 8812 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CTGPR-2525M16** | ● | 19407 | | | TP.. 1603.. | 25 | 25 | 150 | 28 | 32,0 | **107,78** | **CTG-PR-2525** Art. 13834 **10,59 €** | 5 | **2,1×10** Art. 13826 **0,83 €** | 5 | **M6×1 – 21×5** Art. 10945 **15,14 €** | 1 |
| **CTGPL-2525M16** | | | ● | 19408 | | 25 | 25 | 150 | 28 | 32,0 | **107,78** | | | | | | |
| **CTGPR-3232P22** | ● | 19410 | | | TP.. 2204.. | 32 | 32 | 170 | 34 | 40,0 | **136,11** | **CTG-PR-3232** Art. 13835 **14,64 €** | 5 | **3×10** Art. 10955 **1,36 €** | 5 | **M8×1 - 24×7,6** Art. 10954 **18,01 €** | 1 |
| **CTGPL-3232P22** | | | ● | 19411 | | 32 | 32 | 170 | 34 | 40,0 | **136,11** | | | | | | |

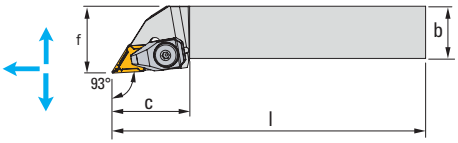
**Plaquita** / Insert / Plaquette: **Pag. 544**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Pasador** - Pin - Goupille |
| | **Brida** - Clamp - Bride |

# Ref. 8792

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS NEGATIVAS DDJN.-93º
DDJN.-93º Negative Inserts External Turning Tool-Holder
Porte-plaquettes tournage exterieur plaquettes negatives DDJN.-93º

New!



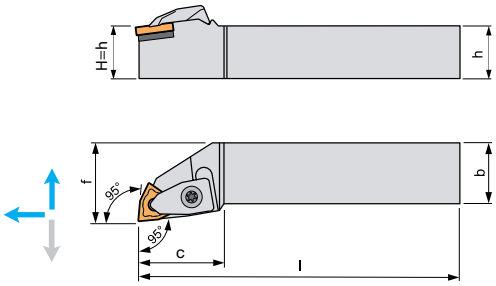

| ISO | R Dcha. | Nº Art. | L Izda. | Nº Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | | Ref.8812 | | Ref.8816 | | Ref. 8816 | | Ref. 8812 | | Ref. 8812 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DDJNR-2020K11 | ● | 31140 | | | DN... 1104 | 20 | 20 | 125 | 30 | 25 | **104,82** | Art. 31237 **9,06 €** | 5 | Art. 31239 **11,68 €** | 5 | Art. 31241 **3,51 €** | 5 | Art. 31243 **4,75 €** | 5 | Art. 31245 **0,85 €** | 5 | Art. 31247 **0,85 €** | 5 |
| DDJNL-2020K11 | | | ● | 31191 | | 20 | 20 | 125 | 30 | 25 | **104,82** | | | | | | | | | | | | |
| DDJNR-2525M11 | ● | 31200 | | | | 25 | 25 | 150 | 30 | 32 | **110,58** | | | | | | | | | | | | |
| DDJNL-2525M11 | | | ● | 31233 | | 25 | 25 | 150 | 30 | 32 | **110,58** | | | | | | | | | | | | |
| DDJNR-2020K15 | ● | 31234 | | | DN... 1504 | 20 | 20 | 125 | 38 | 25 | **104,82** | Art. 31238 **15,79 €** | 5 | Art. 31240 **11,68 €** | 5 | Art. 31242 **3,51 €** | 5 | Art. 31244 **4,75 €** | 5 | Art. 31246 **0,85 €** | 5 | Art. 31248 **0,85 €** | 5 |
| DDJNL-2020K15 | | | ● | 31235 | | 20 | 20 | 125 | 38 | 25 | **104,82** | | | | | | | | | | | | |
| DDJNR-2525M15 | ● | 31236 | | | | 25 | 25 | 150 | 38 | 38 | **110,58** | | | | | | | | | | | | |
| DDJNL-2525M15 | | | ● | 31019 | | 25 | 25 | 150 | 38 | 38 | **110,58** | | | | | | | | | | | | |
| DDJNR-2020K15-N | ● | 31249 | | | DN... 1506 | 20 | 20 | 125 | 35 | 25 | **104,82** | | | | | | | | | | | | |
| DDJNL-2020K15-N | | | ● | 31250 | | 20 | 20 | 125 | 35 | 25 | **104,82** | | | | | | | | | | | | |
| DDJNR-2525M15-N | ● | 31251 | | | | 25 | 25 | 150 | 35 | 32 | **110,58** | | | | | | | | | | | | |
| DDJNL-2525M15-N | | | ● | 31261 | | 25 | 25 | 150 | 35 | 32 | **110,58** | | | | | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 536**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Brida** - Clamp - Bride |
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |
| | **Muelle** - Spring - Resorte |
| | **Arandela** - Washer - Machine à laver |

# Ref. 8790

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS NEGATIVAS DWLN.-95°
DWLN.-95° Negative Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes negatives DWLN.-95°




| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | | Ref. 8812 | | Ref. 8816 | | Ref. 8816 | | Ref. 8812 | | Ref. 8812 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DWLNR-2020K08 | ● | 26511 | | | WNMG 0804.. | 20 | 20 | 125 | 34 | 25 | 104,82 | DWLN-20-25 Art. 10843 16,25 € | 5 | STJC-16 Art. 31240 11,68 € | 1 | DWLN M6 Art. 35215 3,51 € | 5 | M4×1x 13,5x 9,5xø8 Art. 30568 4,75 € | 5 | Muelle Spring Ressort M6 Art. 31246 0,85 € | 5 | Arandela Clamp Rondelle M6 Art. 31248 0,85 € | 5 |
| DWLNL-2020K08 | | | ● | 26512 | | 20 | 20 | 125 | 34 | 25 | 104,82 | | | | | | | | | | | | |
| DWLNR-2525M08 | ● | 26514 | | | | 25 | 25 | 150 | 34 | 32 | 110,58 | | | | | | | | | | | | |
| DWLNL-2525M08 | | | ● | 26515 | | 25 | 25 | 150 | 34 | 32 | 110,58 | | | | | | | | | | | | |

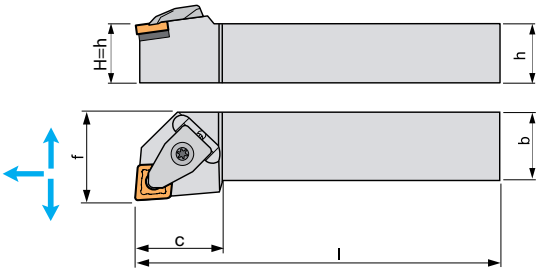
**Plaquita** / Insert / Plaquette: **Pag. 547**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Brida** - Clamp - Bride |
| | **Tornillo Brida** - Clamp Screw - Vis Bride |
| | **Tornillo Placa** - Plate Screw - Vis Plaque |
| | **Muelle** - Spring - Ressort |
| | **Arandela** - Clamp - Rondelle |

# Ref. 8710

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS NEGATIVAS MCLN.-95°
MCLN.-95° Negative Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes negatives MCLN.-95°

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Pasador** - Pin - Goupille |
| | **Brida** - Clamp - Bride |
| | **Tornillo** - Screw - Vis |



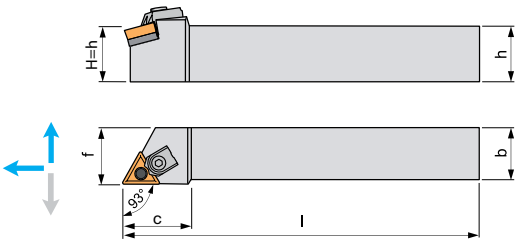

| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | | Ref. 8814 | | Ref. 8812 | | Ref. 8816 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MCLNR-2020K12 | ● | 26439 | | | CNM. 1204.. | 20 | 20 | 125 | 34 | 25 | 101,79 | 7,4×12,45x 12,45 Art. 26553 11,43 € | 5 | MCLN-20-25 Art. 26562 3,61 € | 5 | MCLN Art. 26557 18,01 € | 1 | M4×0,7-8, 6×6,1x ø6,9 Art. 35214 1,84 € | 5 |
| MCLNL-2020K12 | | | ● | 26440 | | 20 | 20 | 125 | 34 | 25 | 101,79 | | | | | | | | |
| MCLNR-2525M12 | ● | 26442 | | | | 25 | 25 | 150 | 34 | 32 | 107,74 | | | | | | | | |
| MCLNL-2525M12 | | | ● | 26443 | | 25 | 25 | 150 | 34 | 32 | 107,74 | | | | | | | | |
| MCLNR-2525M19 | ● | 42948 | | | CNM. 19.. | 25 | 25 | 150 | 42 | 32 | 109,83 | 26×17,85x 4,76 Art. 66181 21,43 € | 5 | 16,5×9 Art. 66182 6,25 € | 5 | 20×7,75 Art. 66183 21,48€ | 1 | M6×1-13,9×10x 9,75 Art. 66184 1,90 € | 5 |
| MCLNL-2525M19 | | | ● | 42949 | | 25 | 25 | 150 | 42 | 32 | 109,83 | | | | | | | | |
| MCLNR-3225P19 | ● | 42951 | | | | 32 | 25 | 170 | 42 | 40 | 132,82 | | | | | | | | |
| MCLNL-3225P19 | | | ● | 42952 | | 32 | 25 | 170 | 42 | 40 | 132,82 | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 532, 534**

# Ref. 8700

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS NEGATIVAS MTJN.-93°
MTJN.-93° Negative Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes negatives MTJN.-93°

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Brida** - Clamp - Bride |
| | **Tornillo Brida** - Clamp Screw - Vis Bride |
| | **Pasador** - Pin - Goupille |
| | **Muelle** - Spring - Ressort |
| | **Arandela** - Clamp - Rondelle |

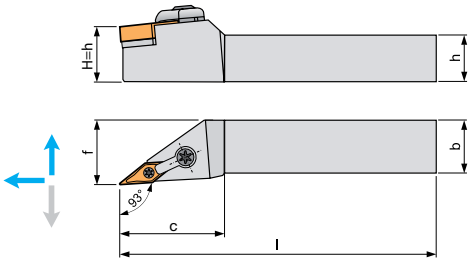



| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | Ref. 8812 | Ref. 8816 | Ref. 8816 | Ref. 8812 | Ref. 8812 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTJNR-2020K16 | ● | 26431 | | | TNMG 1604.. | 20 | 20 | 125 | 34 | 25 | **101,79** | **MTJN-20-25** Art. 26554 **7,75 €** | 5 | **15,56x19** Art. 26556 **18,01 €** | 1 | **DWLN M5** Art. 69818 **3,51 €** | 5 | **ø6×10** Art. 26560 **3,61 €** | 5 | **Muelle Spring** Ressort **M5** Art. 69821 **0,85 €** | 5 | **Arandela Clamp** Rondelle **M5** Art. 69824 **0,85 €** | 5 |
| MTJNL-2020K16 | | | ● | 26433 | | 20 | 20 | 125 | 34 | 25 | **101,79** | | | | | | | | | | | | | |
| MTJNR-2525M16 | ● | 26434 | | | | 25 | 25 | 150 | 34 | 32 | **107,74** | | | | | | | | | | | | | |
| MTJNL-2525M16 | | | ● | 26437 | | 25 | 25 | 150 | 34 | 32 | **107,74** | | | | | | | | | | | | | |
| MTJNR-2525M22 | ● | 11296 | | | TNMG 2204.. | 25 | 25 | 150 | 42 | 32 | **107,74** | **MTJN-25** Art. 13864 **11,79 €** | 5 | **15,52x23,5** Art. 13866 **21,48 €** | 1 | **DWLN M6** Art. 35215 **3,51 €** | 5 | **ø7×15** Art. 30575 **3,61 €** | 5 | **Muelle Spring** Ressort **M6** Art. 31246 **0,85 €** | 5 | **Arandela Clamp** Rondelle **M6** Art. 31248 **0,85 €** | 5 |
| MTJNL-2525M22 | | | ● | 11298 | | 25 | 25 | 150 | 42 | 32 | **107,74** | | | | | | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 542**

# Ref. 8724

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS NEGATIVAS MVJN.-93°
MVJN.-93° Negative Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes negatives MVJN.-93°



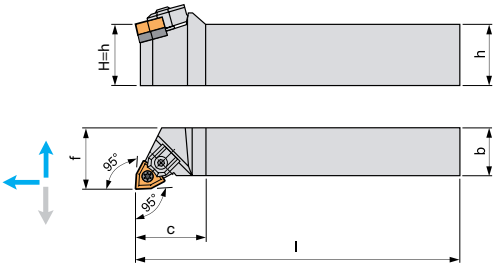

| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | Ref. 8814 | Ref. 8812 | Ref. 8816 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MVJNR-2020K16 | ● | 29960 | | | VNMG 1604.. | 20 | 20 | 125 | 43 | 25 | **164,26** | **6,7x 25,9×9,2** Art. 29971 **15,36 €** | 5 | **M5x 0,8-13x 2,3×5** Art. 29967 **11,36 €** | 5 | **M6×1-24x 13,5xø9,5** Art. 29964 **13,47 €** | 1 | **M6×1-R-L-20,5×7,1** Art. 29965 **3,90 €** | 5 |
| MVJNL-2020K16 | | | ● | 29961 | | 20 | 20 | 125 | 43 | 25 | **164,26** | | | | | | | | |
| MVJNR-2525K16 | ● | 29962 | | | | 25 | 25 | 150 | 43 | 32 | **176,72** | | | | | | | | |
| MVJNL-2525K16 | | | ● | 29963 | | 25 | 25 | 150 | 43 | 32 | **176,72** | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 546**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Pasador** - Pin - Goupille |
| | **Brida** - Clamp - Bride |
| | **Tornillo** - Screw - Vis |

# Ref. 8770

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS NEGATIVAS MWLN.-95°
MWLN.-95° Negative Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes negatives MWLN.-95°



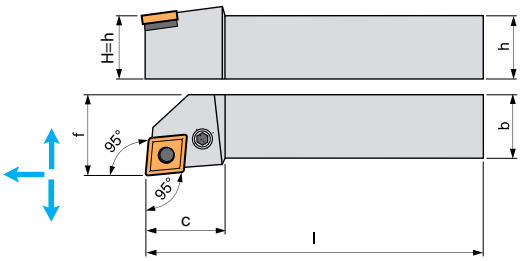

| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | | Ref. 8816 | | Ref. 8812 | | Ref. 8814 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MWLNR-2020K06 | ● | 26499 | | | | 20 | 20 | 125 | 25 | 25 | 101,79 | 5,1x 10,85x 11,3 Art. 10567 **9,49 €** | 5 | M3×0,8-7×4x ø5,5 Art. 10544 **1,84 €** | 5 | M5×0,5-16,6x 6,8 Art. 10540 **15,14 €** | 1 | M3x 0,5-ø4,5x 13,2×7,6 Art. 26560 **3,61 €** | 5 |
| MWLNL-2020K06 | | | ● | 26500 | WNMG 0604.. | 20 | 20 | 125 | 25 | 25 | 101,79 | | | | | | | | |
| MWLNR-2525M06 | ● | 26502 | | | | 25 | 25 | 150 | 25 | 32 | 107,74 | | | | | | | | |
| MWLNL-2525M06 | | | ● | 26503 | | 25 | 25 | 150 | 25 | 32 | 107,74 | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 547**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Tornillo** - Screw - Vis |
| | **Brida** - Clamp - Bride |
| | **Pasador** - Pin - Goupille |

# Ref. 8709

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS NEGATIVAS PCLN.-95°
PCLN.-95° Negative Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes negatives PCLN.-95°



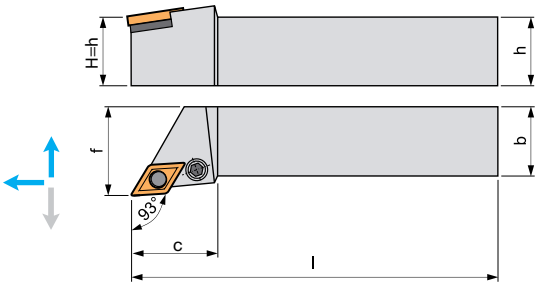

| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | | Ref. 8813 | | Ref. 8816 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PCLNR-2020K12 | ● | 34924 | | | | 20 | 20 | 125 | 28 | 25 | 101,79 | 6,4×3,18x 11,6×17,1 Art. 44952 **11,43 €** | 5 | 13,1x 13,5 Art. 35231 **9,80 €** | 5 | 3-M8x 1-20,7x 8,75xø8 Art. 35230 **3,51 €** | 5 |
| PCLNL-2020K12 | | | ● | 72037 | CNM. 1204.. | 20 | 20 | 125 | 28 | 25 | 101,79 | | | | | | |
| PCLNR-2525M12 | ● | 23095 | | | | 25 | 25 | 150 | 28 | 32 | 107,74 | | | | | | |
| PCLNL-2525M12 | | | ● | 72040 | | 25 | 25 | 150 | 28 | 32 | 107,74 | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 532, 534**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Palanca** - Lever - Levier |
| | **Tornillo** - Screw - Vis |

# Ref. 8725

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS NEGATIVAS PDJN.-93°
PDJN.-93° Negative Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes negatives PDJN.-93°



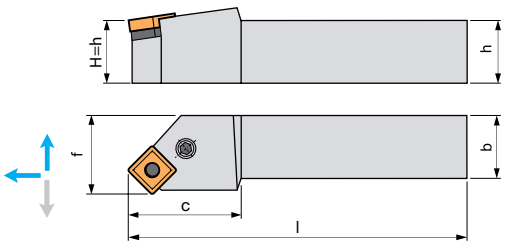

| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | | Ref. 8816 | | Ref. 8813 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PDJNR-2020K11 | ● | 13520 | | | DNM. 1104.. | 20 | 20 | 125 | 28 | 25 | 101,79 | 4,9x 17×8,5 Art. 13794 9,06 € | 5 | M6×1-16,7x 8,65xø6 Art. 13795 3,50 € | 5 | 12×10,2 Art. 13797 11,72 € | 5 |
| PDJNL-2020K11 | | | ● | 13522 | | 20 | 20 | 125 | 28 | 25 | 101,79 | | | | | | |
| PDJNR-2020K15 | ● | 11300 | | | DNM. 1506.. | 20 | 20 | 125 | 34 | 25 | 101,79 | 6,4x 23,4×11,6 Art. 13869 15,79 € | 5 | M8×1-21,1x 10,35xø8 Art. 13822 3,20 € | 5 | 14,7×16,2 Art. 13868 13,31 € | 5 |
| PDJNL-2020K15 | | | ● | 11301 | | 20 | 20 | 125 | 34 | 25 | 101,79 | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 536**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Tornillo** - Screw - Vis |
| | **Palanca** - Lever - Levier |

# Ref. 8791

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS NEGATIVAS PSSN-45°
PSSN-45° Negative Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes negatives PSSN-45°




| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | | Ref. 8816 | | Ref. 8813 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PSSNR-2020K12 | ● | 35223 | | | SNM. 1204.. | 20 | 20 | 125 | 28 | 25 | 99,84 | 6,35x 11,66 Art. 35229 9,16 € | 5 | M8x 1-20,7x 8,75xø8 Art. 35230 3,51 € | 5 | 13,1×13,5 Art. 35231 9,80 € | 5 |
| PSSNL-2020K12 | | | ● | 35224 | | 20 | 20 | 125 | 28 | 25 | 99,84 | | | | | | |
| PSSNR-2525M12 | ● | 35225 | | | | 25 | 25 | 150 | 28 | 32 | 105,68 | | | | | | |
| PSSNL-2525M12 | | | ● | 35226 | | 25 | 25 | 150 | 28 | 32 | 105,68 | | | | | | |
| PSSNR-3225P12 | ● | 35227 | | | | 32 | 25 | 170 | 28 | 32 | 115,62 | | | | | | |
| PSSNL-3225P12 | | | ● | 35228 | | 32 | 25 | 170 | 28 | 32 | 115,62 | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 540**

| | | | | | |
|---|---|---|---|---|---|
| | **Placa Base** - Base Plate - Plaque de base | | **Tornillo** - Screw - Vis | | **Palanca** - Lever - Levier |

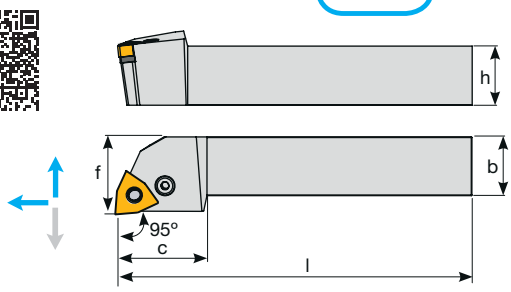
# Ref. 8711

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS NEGATIVAS PWLN.-95º

PWLN.-95º Negative Inserts External Turning Tool-Holder

Porte-plaquettes tournage exterieur plaquettes negatives PWLN.-95º

New!




| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **PWLNR-1616H06** | ● | 72344 | | | | 16 | 16 | 100 | 25 | 20 | **87,98** |
| **PWLNL-1616H06** | | | ● | 25720 | | 16 | 16 | 100 | 25 | 20 | **87,98** |
| **PWLNR-2020K06** | ● | 25723 | | | WNMG-0604.. | 20 | 20 | 125 | 25 | 25 | **98,83** |
| **PWLNL-2020K06** | | | ● | 25724 | | 20 | 20 | 125 | 25 | 25 | **98,83** |
| **PWLNR-2525M06** | ● | 25736 | | | | 25 | 25 | 150 | 25 | 32 | **104,60** |
| **PWLNL-2525M06** | | | ● | 80529 | | 25 | 25 | 150 | 25 | 32 | **104,60** |
| **PWLNR-2525M08** | ● | 74976 | | | | 25 | 25 | 150 | 34 | 32 | **104,60** |
| **PWLNL-2525M08** | | | ● | 25741 | WNMG-0804.. | 25 | 25 | 150 | 34 | 32 | **104,60** |
| **PWLNR-3232P08** | ● | 25748 | | | | 32 | 32 | 170 | 34 | 40 | **112,25** |
| **PWLNL-3232P08** | | | ● | 25759 | | 32 | 32 | 170 | 34 | 40 | **112,25** |

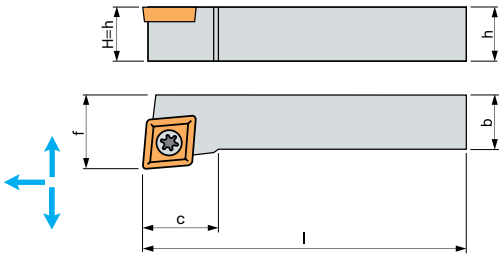
| Ref. 8815 | | Ref. 8813 | | Ref. 8816 | |
|---|---|---|---|---|---|
| **PWLN-06** Art. 59086 **11,43 €** | 5 | **3,5×12,2** Art. 25953 **13,61 €** | 5 | **M6×1-17** Art. 25955 **7,98 €** | 5 |
| **PWLN-08** Art. 25952 **12,45 €** | 5 | **4,5×13** Art. 25954 **13,61 €** | 5 | **M8×1-21** Art. 25956 **7,98 €** | 5 |

**Plaquita** / Insert / Plaquette: **Pag. 547**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Palanca** - Lever - Levier |
| | **Tornillo** - Screw - Vis |

# Ref. 8704

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS POSITIVAS SCLC.-95°
SCLC.-95° Positive Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes positives SCLC.-95°



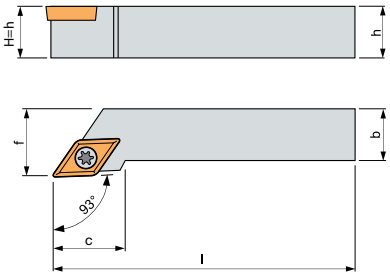

| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8816 | | Ref. 8816 | | Ref. 8801 | | Ref. 8815 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SCLCR-0808-D06** | ● | 42936 | | | CC..06.. | 08 | 8 | 60 | 10 | 10 | **78,81** | | | **T-07** Art. 10846 **3,20 €** | 5 | **ZT-07** Art. 19569 **11,06 €** | 1 | | |
| **SCLCL-0808-D06** | | | ● | 42937 | | 08 | 8 | 60 | 10 | 10 | **78,81** | | | | | | | | |
| **SCLCR-1010-E06** | ● | 42938 | | | | 10 | 10 | 70 | 10 | 12 | **78,81** | | | | | | | | |
| **SCLCL-1010-E06** | | | ● | 42940 | | 10 | 10 | 70 | 10 | 12 | **78,81** | | | | | | | | |
| **SCLCR-1212-F09** | ● | 42941 | | | CC..09.. | 12 | 12 | 80 | 16 | 16 | **84,36** | | | **T-15** Art. 10895 **3,42 €** | 5 | **ZT-15** Art. 10512 **11,06 €** | 1 | | |
| **SCLCL-1212-F09** | | | ● | 42942 | | 12 | 12 | 80 | 16 | 16 | **84,36** | | | | | | | | |
| **SCLCR-1616-H09** | ● | 42943 | | | | 16 | 16 | 100 | 16 | 20 | **87,34** | | | | | | | | |
| **SCLCL-1616-H09** | | | ● | 42944 | | 16 | 16 | 100 | 16 | 20 | **87,34** | | | | | | | | |
| **SCLCR-2020-K09** | ● | 42945 | | | | 20 | 20 | 125 | 16 | 25 | **93,61** | | | | | | | | |
| **SCLCL-2020-K09** | | | ● | 42946 | | 20 | 20 | 125 | 16 | 25 | **93,61** | | | | | | | | |
| **SCLCR-2525-M12** | ● | 67771 | | | CC..12.. | 25 | 25 | 150 | 25 | 32 | **102,56** | **M4×0,5x M6×0,75x 10×5,5xø7,7** Art. 19007 **8,44 €** | 5 | **T-15** Art. 30686 **3,42 €** | 1 | | | **3,95×11,40 x11,40** Art. 54065 **10,44 €** | 5 |
| **SCLCL-2525-M12** | | | ● | 72069 | | 25 | 25 | 150 | 25 | 32 | **102,56** | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 530**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

# Ref. 8729

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS POSITIVAS SDJC.-93°
SDJC.-93° Positive Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes positives SDJC.-93°




| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

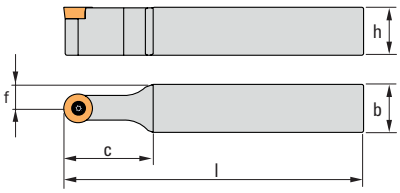
| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | | Ref. 8816 | | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDJCR-1010E07 | ● | 29946 | | | DC.. 0702.. | 10 | 10 | 70 | 16 | 12 | **117,33** | | | | | | | | |
| SDJCL-1010E07 | | | ● | 29947 | | 10 | 10 | 70 | 16 | 12 | **117,33** | | | | | **T-07** Art. 10846 **3,20 €** | 5 | **ZT-07** Art. 19569 **11,06 €** | 1 |
| SDJCR-1212F07 | ● | 29949 | | | | 12 | 12 | 80 | 18 | 16 | **125,52** | | | | | | | | |
| SDJCL-1212F07 | | | ● | 29950 | | 12 | 12 | 80 | 18 | 16 | **125,52** | | | | | | | | |
| SDJCR-1212F11 | ● | 29951 | | | DC.. 11T3.. | 12 | 12 | 80 | 18 | 16 | **125,52** | | | | | **T-15** Art. 10895 **3,42 €** | 5 | **ZT-15** Art. 10512 **11,06 €** | 1 |
| SDJCL-1212F11 | | | ● | 29952 | | 12 | 12 | 80 | 18 | 16 | **125,52** | | | | | | | | |
| SDJCR-1616H11 | ● | 29953 | | | | 16 | 16 | 100 | 22 | 20 | **130,01** | **6,6x 17,48×8,5** Art. 29958 **15,79 €** | 5 | **M3,5×0,6x M5×0,5x 8,5×5xø6,25** Art. 29959 **8,44 €** | 5 | **T-15** Art. 10847 **3,42 €** | 5 | **ZT-16** Art. 10856 **11,06 €** | 1 |
| SDJCL-1616H11 | | | ● | 29954 | | 16 | 16 | 100 | 22 | 20 | **130,01** | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pags. 534, 535**

# Ref. 8705

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS POSITIVAS SRDCN
SRDCN Positive Inserts External Turning Tool-Holder
Porte-plaquettes tournage exterieur plaquettes positives SRDCN

New!




| ISO | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SRDCN-2020K08 | 70728 | RC..0803 | 20 | 20 | 125 | 37 | 10,00 | **98,92** | **M3×7** Art. 70192 **3,42 €** | 5 | **ZT-8** Art. 10506 **11,06 €** | 1 |
| SRDCN-2525M08 | 70731 | | 25 | 25 | 150 | 37 | 12,50 | **105,63** | | | | |
| SRDCN-2020K10 | 24355 | RC..1003 / RC..10T3 | 20 | 20 | 125 | 35 | 10,00 | **98,92** | **M3,5×8,5** Art. 70740 **3,42 €** | 5 | **ZT-15** Art. 10512 **11,06 €** | 1 |
| SRDCN-2525M10 | 67610 | | 25 | 25 | 150 | 35 | 12,50 | **105,63** | | | | |
| SRDCN-2020K12 | 34448 | RC..1204 | 20 | 20 | 125 | 38 | 10,00 | **98,92** | | | | |
| SRDCN-2525M12 | 70733 | | 25 | 25 | 150 | 38 | 12,50 | **105,63** | | | | |
| SRDCN-2525M16 | 70735 | RC..1606 | 25 | 25 | 150 | 35 | 12,50 | **105,63** | **M5×12** Art. 70746 **3,42 €** | 5 | **ZT-20** Art. 13845 **11,06 €** | 1 |

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Destornillador** Screwdriver Tournevis |

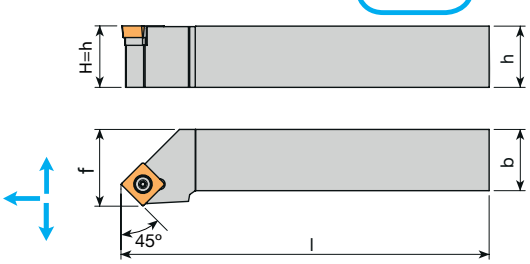
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8705 SRDCN-2020K08**

**Plaquita** / Insert / Plaquette: **Pag. 538**

# Ref. 8723

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS POSITIVAS SSSC.-45º
SSSC.-45º Positive Inserts External Turning Tool-Holder
Porte-plaquettes tournage exterieur plaquettes positives SSSC.-45º

New!



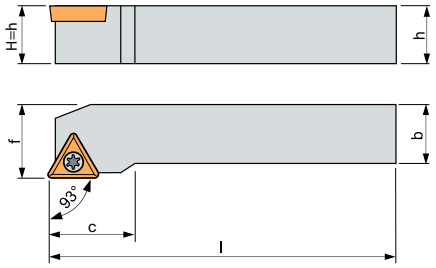

| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | f mm | € | Ref. 8815 | | Ref. 8816 | | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SSSCR-1212F09** | ● | 28386 | | | | 12 | 12 | 80 | 16 | **84,36** | - | | - | | **T-15-M3,5×11** Art. 31558 **3,42 €** | 5 | **ZT-15** Art. 10512 **11,06 €** | 1 |
| **SSSCL-1212F09** | | | ● | 67800 | SC.. 09T3 | 12 | 12 | 80 | 16 | **84,36** | - | | - | | | | | |
| **SSSCR-1616H09** | ● | 69642 | | | | 16 | 16 | 100 | 20 | **87,34** | **SSSC-09** Art. 31553 **10,07 €** | 5 | **M3,5×0,6x M5×0,5×11,3x 3,5xø6** Art. 31556 **8,44 €** | 5 | **T-15-3,5×14** Art. 31560 **3,42 €** | 5 | | |
| **SSSCL-1616H09** | | | ● | 28392 | | 16 | 16 | 100 | 20 | **87,34** | | | | | | | | |
| **SSSCR-2020K12** | ● | 68959 | | | | 20 | 20 | 125 | 25 | **93,61** | **SSSC-12** Art. 16147 **10,44 €** | 5 | **M4,5×0,75x M6×0,75×13x 4,5×7,5** Art. 31557 **8,44 €** | 5 | **T-20-M4,5×16** Art. 31559 **3,42 €** | 5 | **ZT-20** Art. 13845 **11,06 €** | 1 |
| **SSSCL-2020K12** | | | ● | 28393 | SC.. 1204 | 20 | 20 | 125 | 25 | **93,61** | | | | | | | | |
| **SSSCR-2525M12** | ● | 39344 | | | | 25 | 25 | 150 | 32 | **102,56** | | | | | | | | |
| **SSSCL-2525M12** | | | ● | 28394 | | 25 | 25 | 150 | 32 | **102,56** | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 539**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

# Ref. 8703

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS POSITIVAS STJC.-93°
STJC.-93° Positive Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes positives STJC.-93°



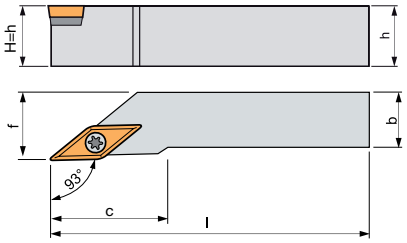

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

| | ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| New! | STJCR-1010E09 | ● | 83741 | | | TC.. 0902.. | 10 | 10 | 70 | 14 | 12 | 88,57 | | | T-06 Art. 83748 3,20 € | 5 | ZT-06 Art. 83747 11,06 € | 1 |
| New! | STJCL-1010E09 | | | ● | 83742 | | 10 | 10 | 70 | 14 | 12 | 88,57 | | | | | | |
| | STJCR-1616H11 | ● | 18596 | | | TC.. 1102.. | 16 | 16 | 100 | 22 | 20 | 91,93 | | | T-07 Art. 10846 3,20 € | 5 | ZT-07 Art. 19569 11,06 € | 1 |
| | STJCL-1616H11 | | | ● | 18649 | | 16 | 16 | 100 | 22 | 20 | 91,93 | | | | | | |
| | STJCR-2020K16 | ● | 18660 | | | TC.. 16T3.. | 20 | 20 | 125 | 22 | 25 | 98,92 | 6,6×11,95x 13,55 Art. 26554 7,75 € | 5 | T-15 Art. 10847 3,42 € | 5 | ZT-16 Art. 10856 11,06 € | 1 |
| | STJCL-2020K16 | | | ● | 18664 | | 20 | 20 | 125 | 22 | 25 | 98,92 | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 541**

# Ref. 8727

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS POSITIVAS SVJB-93°
SVJB-93° Positive Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes positives SVJB-93°



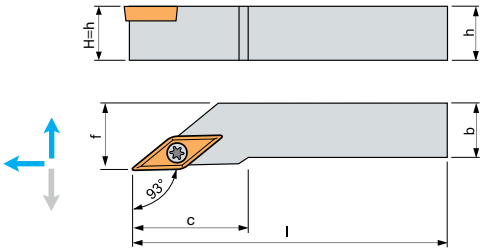

| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | | Ref. 8816 | | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SVJBR-1616H11 | ● | 82835 | | | VBMT 1103.. | 16 | 16 | 100 | 20 | 20 | 114,20 | - | | T-07 Art. 10846 3,20 € | 5 | - | | ZT-07 Art. 19569 11,06 € | 1 |
| SVJBL-1616H11 | | | ● | 82836 | | 16 | 16 | 100 | 20 | 20 | 114,20 | | | | | | | | |
| SVJBR-2020K16 | ● | 22041 | | | VBMT 1604.. | 20 | 20 | 125 | 34 | 25 | 121,62 | 6,7x 26×8,4 Art. 10865 10,53€ | 5 | T-15 Art. 10847 3,42 € | 5 | M3,5x 0,6xM5x 0,5× 8,5x 5×6,2 Art. 29959 8,44 € | 5 | ZT-16 Art. 10856 11,06 € | 1 |
| SVJBL-2020K16 | | | ● | 64137 | | 20 | 20 | 125 | 34 | 25 | 121,62 | | | | | | | | |
| SVJBR-2525M16 | ● | 82833 | | | | 25 | 25 | 150 | 34 | 32 | 130,14 | | | | | | | | |
| SVJBL-2525M16 | | | ● | 82834 | | 25 | 25 | 150 | 34 | 32 | 130,14 | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 545**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

# Ref. 8728

## PORTA-PLAQUITAS TORNEADO EXTERIOR PLAQUITAS POSITIVAS SVJC-93°
SVJC-93° Positive Inserts External Turning Tool-Holder
Porte-Plaquettes tournage extérieur plaquettes positives SVJC-93°



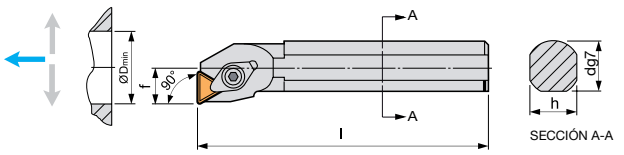

| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | h mm | b mm | l mm | c mm | f mm | € | Ref. 8815 | Ref. 8816 | Ref. 8816 | Ref. 8801 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SVJCR-1212F11** | ● | 19413 | | | VC.. 1103.. | 12 | 12 | 80 | 25 | 16 | **98,23** | | | **T-07** Art. 10846 **3,20 €** (5) | **ZT-07** Art. 19569 **11,06 €** (1) |
| **SVJCL-1212F11** | | | ● | 19414 | | 12 | 12 | 80 | 25 | 16 | **98,23** | | | | |
| **SVJCR-2020K16** | ● | 19417 | | | VC.. 1604.. | 20 | 20 | 125 | 37 | 25 | **115,15** | **6,7×26×8,4** Art. 10865 **10,53 €** (5) | **M3,5×0,6x M5×0,5× 8,5x 5xø6,25** Art. 29959 **8,44 €** (5) | **T-15** Art. 10847 **3,42 €** (5) | **ZT-16** Art. 10856 **11,06 €** (1) |
| **SVJCL-2020K16** | | | ● | 19419 | | 20 | 20 | 125 | 37 | 25 | **115,15** | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 545**

**Placa Base** - Base Plate - Plaque de base | **Tornillo** - Screw - Vis | **Tornillo** - Screw - Vis | **Destornillador** - Screwdriver - Tournevis

# Ref. 8715

## PORTA-PLAQUITAS TORNEADO INTERIOR PLAQUITAS POSITIVAS S-CTFP.-90°
S-CTFP.-90° Positive Inserts Internal Turning Tool-Holder
Porte-Plaquettes tournage intérieur plaquettes positives S-CTFP.-90°




**$D_{min}$ = Diám. mín. Int. Pieza** / Piece Int. min. Diam. / Diam. min intérieur pièce

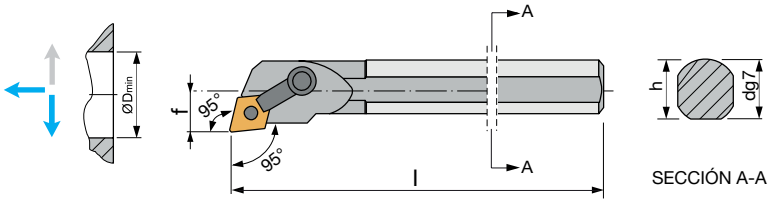
| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | d mm | f mm | h mm | l mm | $D_{min}$ mm | € | Ref. 8812 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S16R-CTFPR16** | ● | 10882 | | | TP.. 1603.. | 16 | 11 | 15 | 200 | 20 | **128,62** | **M6×1-15,3X5,2** Art. 10886 **15,14 €** (1) |
| **S16R-CTFPL16** | | | ● | 10883 | | 16 | 11 | 15 | 200 | 20 | **128,62** | |
| **S25T-CTFPR16** | ● | 11546 | | | | 25 | 17 | 23 | 300 | 32 | **177,66** | **M6×1-16,3X5** Art. 35216 **15,14 €** (1) |
| **S25T-CTFPL16** | | | ● | 11560 | | 25 | 17 | 23 | 300 | 32 | **177,66** | |

**Plaquita** / Insert / Plaquette: **Pag. 544**

**Brida** - Clamp - Bride

# Ref. 8731

## PORTA-PLAQUITAS TORNEADO INTERIOR PLAQUITAS NEGATIVAS S-MCLN.-95°
S-MCLN.-95° Negative Inserts Internal Turning Tool-Holder
Porte-Plaquettes tournage intérieur plaquettes negatives S-MCLN.-95°




**$D_{min}$ = Diám. mín. Int. Pieza** / Piece Int. min. Diam. / Diam. min intérieur pièce

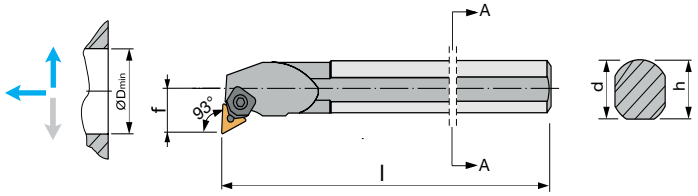
| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | d mm | f mm | l mm | $D_{min}$ mm | € | Ref. 8815 | | Ref. 8814 | | Ref. 8812 | | Ref. 8816 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S25T-MCL-NR12** | ● | 19420 | | | CNM. 1204.. | 25 | 17 | 300 | 32 | **208,87** | | | **2,5-1/4"x26-13,3×3,5×4,2** Art. 10897 **4,89 €** | 5 | **M6x 1-18,5x 13,5** Art. 10901 **13,47 €** | 1 | **M6x 1-7,1x 7,1x 20,5** Art. 21413 **4,81 €** | 1 |
| **S25T-MCLNL12** | | | ● | 19425 | | 25 | 17 | 300 | 32 | **208,87** | | | | | | | | |
| **S32U-MCL-NR12** | ● | 19426 | | | | 32 | 22 | 350 | 40 | **270,38** | **7,4×12,45 x12,45** Art. 26553 **11,43 €** | 5 | **2,5-1/4"x26-17,2×4×5,3** Art. 10900 **11,36 €** | 5 | | | **M6x 1-18,5x 13,5** Art. 59918 **4,81 €** | 1 |
| **S32U-MCLNL12** | | | ● | 19429 | | 32 | 22 | 350 | 40 | **270,38** | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 532, 534**

**Placa Base** - Base Plate - Plaque de base | **Pasador** - Pin - Goupille | **Brida** - Clamp - Bride

# Ref. 8732

## PORTA-PLAQUITAS TORNEADO INTERIOR PLAQUITAS NEGATIVAS S-MTUN.-93°
S-MTUN.-93° Negative Inserts Internal Turning Tool-Holder
Porte-Plaquettes tournage intérieur plaquettes negatives S-MTUN.-93°




**$D_{min}$ = Diám. mín. Int. Pieza** / Piece Int. min. Diam. / Diam. min intérieur pièce

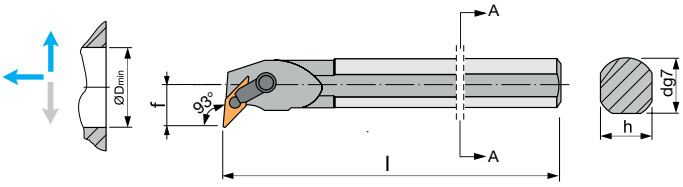
| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | d mm | f mm | l mm | $D_{min}$ mm | € | Ref. 8815 | | Ref. 8814 | | Ref. 8812 | | Ref. 8816 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S25T-MTUNR16** | ● | 35233 | | | TNM. 1604.. | 25 | 17 | 300 | 34 | **219,51** | | | | | | | **M3×0,5-5,9×4,1xø5,5** Art. 35239 **3,51 €** | 5 |
| **S25T-MTUNL16** | | | ● | 35234 | | 25 | 17 | 300 | 34 | **219,51** | **6,6×11,95 x13,55** Art. 26554 **7,75 €** | 5 | **M3×0,5-ø4,5x 10,1×5** Art. 30573 **3,61 €** | 5 | **M8x 1-23,7** Art. 26556 **18,01 €** | 1 | | |
| **S32U-MTUNR16** | ● | 35235 | | | | 32 | 22 | 350 | 39 | **284,19** | | | | | | | **M3×0,8-7×4xø5,5** Art. 10544 **1,84 €** | 5 |
| **S32U-MTUNL16** | | | ● | 35236 | | 32 | 22 | 350 | 39 | **284,19** | | | | | | | | |
| **S40V-MTUNR22** | ● | 35237 | | | TNM. 2204.. | 40 | 27 | 400 | 48 | **322,12** | **7,4×17,3 x19,7** Art. 13864 **11,79 €** | 5 | | | | | | |
| **S40V-MTUNL22** | | | ● | 35238 | | 40 | 27 | 400 | 48 | **322,12** | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 542**

**Placa Base** - Base Plate - Plaque de base | **Pasador** - Pin - Goupille | **Brida** - Clamp - Bride | **Tornillo** - Screw - Vis

# Ref. 8769

## PORTA-PLAQUITAS TORNEADO INTERIOR PLAQUITAS NEGATIVAS S-MVUN-93°
S-MVUN-93° Negative Inserts Internal Turning Tool-Holder
Porte-Plaquettes Tournage Intérieur Plaquettes Negatives S-MVUN-93°




**$D_{min}$ = Diám. mín. Int. Pieza** / Piece Int. min. Diam. / Diam. min intérieur pièce

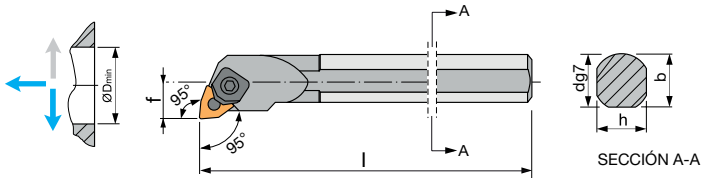
| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | d mm | f mm | h mm | l mm | $D_{min}$ mm | € | Ref. 8815 | | Ref. 8814 | | Ref. 8816 | | Ref. 8812 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S25T-MVUNR16** | ● | 29968 | | | VNMG 1604.. | 25 | 17 | 23 | 300 | 31 | **316,55** | **MVJN-16** Art. 30576 **15,36 €** | 5 | **M5x 0,8-13x 2,3×5** Art. 29967 **11,36 €** | 5 | **M6x 1-R-L-20,5x 7,1** Art. 29965 **3,90 €** | 5 | **M6x 1-21,7x 13,5** Art. 29970 **13,47 €** | 1 |
| **S25T-MVUNL16** | | | ● | 29969 | | 25 | 17 | 23 | 300 | 31 | **316,55** | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 546**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Pasador** - Pin - Goupille |
| | **Tornillo** - Screw - Vis |
| | **Brida** - Clamp - Bride |

# Ref. 8780

## PORTA-PLAQUITAS TORNEADO INTERIOR PLAQUITAS NEGATIVAS S-MWLN.-95°
S-MWLN.-95° Negative Inserts Internal Turning Tool-Holder
Porte-Plaquettes tournage intérieur plaquettes negatives S-MWLN.-95°




**$D_{min}$ = Diám. mín. Int. Pieza** / Piece Int. min. Diam. / Diam. min intérieur pièce

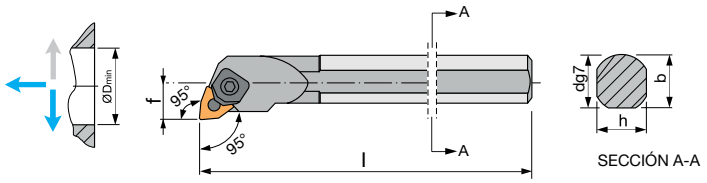
| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | d mm | f mm | l mm | $D_{min}$ mm | € | Ref. 8815 | | Ref. 8814 | | Ref. 8812 | | Ref. 8816 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S25T-MWL-NR06 | ● | 19461 | | | WNMG 0604.. | 25 | 17 | 300 | 32 | **208,87** | **5,1x 10,85 x11,3** Art. 10567 **9,49 €** | 5 | **M3x 0,5-ø4,5x 10,1×5** Art. 30573 **3,61 €** | 5 | **M5×0,5-16,6×6,8** Art. 10540 **15,14 €** | 1 | **M3×0,8-7×4xø5,5** Art. 10544 **1,84 €** | 5 |
| S25T-MWL-NL06 | | | ● | 19463 | | 25 | 17 | 300 | 32 | **208,87** | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 547**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Pasador** - Pin - Goupille |
| | **Brida** - Clamp - Bride |
| | **Tornillo** - Screw - Vis |

# Ref. 8800

## PORTA-PLAQUITAS TORNEADO INTERIOR PLAQUITAS NEGATIVAS S-MWLN.-95°
S-MWLN.-95° Negative Inserts Internal Turning Tool-Holder
Porte-Plaquettes tournage intérieur plaquettes negatives S-MWLN.-95°




**$D_{min}$ = Diám. mín. Int. Pieza** / Piece Int. min. Diam. / Diam. min intérieur pièce

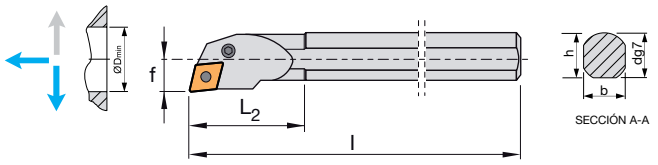
| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | d mm | f mm | l mm | $D_{min}$ mm | € | Ref. 8815 | | Ref. 8814 | | Ref. 8812 | | Ref. 8816 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S25T-MWLNR08 | ● | 19527 | | | WNMG 0804.. | 25 | 17 | 300 | 32 | **208,87** | | | **S25-MWLN-08** Art. 30574 **3,61 €** | 5 | **P/MW-08** Art. 61061 **15,16 €** | 1 | **2,5-M4x 0,7-5,5x 3,7** Art. 30571 **8,38 €** | 5 |
| S25T-MWLNL08 | | | ● | 19529 | | 25 | 17 | 300 | 32 | **208,87** | | | | | | | | |
| S32U-MWLNR08 | ● | 19551 | | | | 32 | 22 | 350 | 40 | **270,38** | **7,4×15,35 x15,95** Art. 35232 **16,25 €** | 5 | **M4×0,7-ø6×12,5×5,6** Art. 30575 **3,61 €** | 5 | | | | |
| S32U-MWLNL08 | | | ● | 19567 | | 32 | 22 | 350 | 40 | **270,38** | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 547**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Pasador** - Pin - Goupille |
| | **Brida** - Clamp - Bride |
| | **Tornillo** - Screw - Vis |

# Ref. 8733

## PORTA-PLAQUITAS TORNEADO INTERIOR PLAQUITAS NEGATIVAS S-PCLN.-95°
S-PCLN.-95° Negative Inserts Internal Turning Tool-Holder
Porte-Plaquettes tournage intérieur plaquettes negatives S-PCLN.-95°




**$D_{min}$ = Diám. mín. Int. Pieza** / Piece Int. min. Diam. / Diam. min intérieur pièce

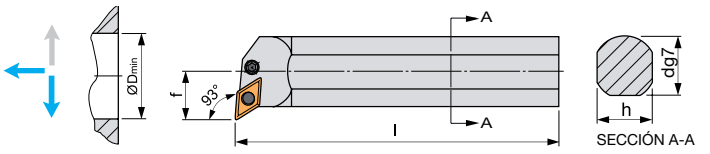
| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | d mm | f mm | l mm | $D_{min}$ mm | € | Ref. 8815 | | Ref. 8813 | | Ref. 8816 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S25T-PCLNR12 | ● | 72042 | | | CNM. 1204.. | 25 | 17 | 300 | 25 | 217,08 | | | 13,4X12,1X4,7 Art. 72057 11,94 € | 5 | M6X1-13,4X6 Art. 72060 3,62 € | 1 |
| S25T-PCLNL12 | | | ● | 72043 | | 25 | 17 | 300 | 25 | 217,08 | | | | | | |
| S32U-PCLNR12 | ● | 44562 | | | | 32 | 22 | 350 | 32 | 281,40 | 11,68X6,80X3,18 Art. 44952 11,43 € | 1 | 13,5X13,2X4,2 Art. 72058 11,94 € | 5 | M8X1-17X8 Art. 44950 3,62 € | 1 |
| S32U-PCLNL12 | | | ● | 72046 | | 32 | 22 | 350 | 32 | 281,40 | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 532, 534**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Palanca** - Lever - Levier |
| | **Tornillo** - Screw - Vis |

# Ref. 8765

## PORTA-PLAQUITAS TORNEADO INTERIOR PLAQUITAS NEGATIVAS S-PDUN.-93°
S-PDUN.-93° Negative Inserts Internal Turning Tool-Holder
Porte-Plaquettes tournage intérieur plaquettes negatives S-PDUN.-93°




**$D_{min}$ = Diám. mín. Int. Pieza** / Piece Int. min. Diam. / Diam. min intérieur pièce

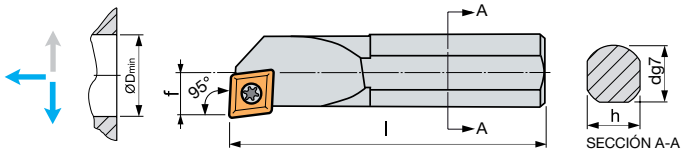
| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | d mm | f mm | h mm | l mm | $D_{min}$ mm | € | Ref. 8815 | | Ref. 8813 | | Ref. 8814 | | Ref. 8816 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S25T-PDUNR11 | ● | 13528 | | | DNMG 1104.. | 25 | 17 | 23 | 300 | 32 | 208,87 | 4,9x 17x8,5 Art. 13794 9,06 € | 5 | 12x 10,2 Art. 13797 11,72 € | 5 | 4,9x ø5,79x 4,6x5,2 Art. 35218 0,93 € | 5 | M6x 1-16,7x 8,65xø6 Art. 13795 3,50 € | 5 |
| S25T-PDUNL11 | | | ● | 13529 | | 25 | 17 | 23 | 300 | 32 | 208,87 | | | | | | | | |
| S32U-PDUNR15 | ● | 11346 | | | DNMG 1504.. | 32 | 22 | 30 | 350 | 40 | 270,38 | 6,4x 23,4x11,6 Art. 13869 15,79 € | 5 | 14,7x 16,2 Art. 13868 13,31 € | 5 | 6,6x ø7x 5,8x5,2 Art. 35219 1,14 € | 5 | M8x 1-17x 9,1xø8 Art. 13819 3,51 € | 5 |
| S32U-PDUNL15 | | | ● | 11488 | | 32 | 22 | 30 | 350 | 40 | 270,38 | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 536**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Palanca** - Lever - Levier |
| | **Pasador** - Pin - Goupille |
| | **Tornillo** - Screw - Vis |

# Ref. 8751

## PORTA-PLAQUITAS TORNEADO INTERIOR PLAQUITAS POSITIVAS S-SCLC.-95°
S-SCLC.-95° Positive Inserts Internal Turning Tool-Holder
Porte-Plaquettes tournage intérieur plaquettes positives S-SCLC.-95°




**$D_{min}$ = Diám. mín. Int. Pieza** / Piece Int. min. Diam. / Diam. min intérieur pièce

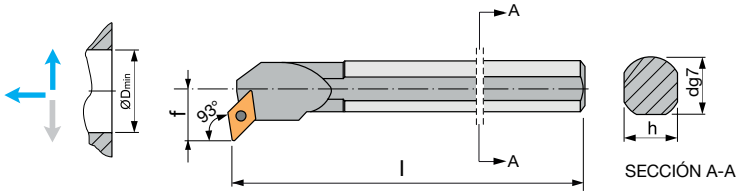
| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | d mm | f mm | l mm | h mm | $D_{min}$ mm | € | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S08K-SCLCR06** | ● | 19432 | | | CC.. 060204 | 08 | 5 | 125 | 7 | 11 | **110,60** | **T-07** Art. 21056 **3,20 €** | 5 | **ZT-07** Art. 19569 **11,06 €** | 1 |
| **S08K-SCLCL06** | | | ● | 19434 | | 08 | 5 | 125 | 7 | 11 | **110,60** | | | | |
| **S10M-SCLCR06** | ● | 19435 | | | | 10 | 7 | 150 | 9 | 13 | **110,60** | | | | |
| **S10M-SCLCL06** | | | ● | 19438 | | 10 | 7 | 150 | 9 | 13 | **110,60** | | | | |
| **S12M-SCLCR06** | ● | 26469 | | | | 12 | 9 | 150 | 11 | 16 | **110,60** | | | | |
| **S12M-SCLCL06** | | | ● | 26473 | | 12 | 9 | 150 | 11 | 16 | **110,60** | | | | |
| **S16R-SCLCR09** | ● | 19440 | | | CC.. 09T308 | 16 | 11 | 200 | 15 | 20 | **115,18** | **T-15** Art. 35217 **3,42 €** | 5 | **ZT-15** Art. 10512 **11,06 €** | 1 |
| **S16R-SCLCL09** | | | ● | 19441 | | 16 | 11 | 200 | 15 | 20 | **115,18** | | | | |
| **S20S-SCLCR09** | ● | 19443 | | | | 20 | 13 | 250 | 18 | 25 | **145,20** | | | | |
| **S20S-SCLCL09** | | | ● | 19444 | | 20 | 13 | 250 | 18 | 25 | **145,20** | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 530**

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

# Ref. 8761

## PORTA-PLAQUITAS TORNEADO INTERIOR PLAQUITAS POSITIVAS S-SDUC.-93°
S-SDUC.-93° Positive Inserts Internal Turning Tool-Holder
Porte-Plaquettes tournage intérieur plaquettes positives S-SDUC.-93°




**$D_{min}$ = Diám. mín. Int. Pieza** / Piece Int. min. Diam. / Diam. min intérieur pièce

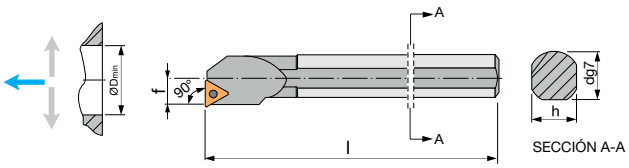
| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | d mm | f mm | l mm | h mm | $D_{min}$ mm | € | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S12M-SDUCR07** | ● | 26478 | | | DC.. 0702.. | 12 | 9 | 150 | 11 | 16 | **110,60** | **T-07** Art. 10846 **3,20 €** | 5 | **ZT-07** Art. 19569 **11,06 €** | 1 |
| **S12M-SDUCL07** | | | ● | 26479 | | 12 | 9 | 150 | 11 | 16 | **110,60** | | | | |
| **S16R-SDUCR07** | ● | 19446 | | | | 16 | 11 | 200 | 15 | 20 | **115,18** | | | | |
| **S16R-SDUCL07** | | | ● | 19449 | | 16 | 11 | 200 | 15 | 20 | **115,18** | | | | |
| **S20S-SDUCR11** | ● | 19450 | | | DC.. 11T3.. | 20 | 13 | 250 | 18 | 25 | **145,20** | **T-15** Art. 10895 **3,42 €** | 5 | **ZT-15** Art. 10512 **11,06 €** | 1 |
| **S20S-SDUCL11** | | | ● | 19452 | | 20 | 13 | 250 | 18 | 25 | **145,20** | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 534, 535**

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

# Ref. 8718

## PORTA-PLAQUITAS TORNEADO INTERIOR PLAQUITAS POSITIVAS S-STFC.-90°
S-STFC.-90° Positive Inserts Internal Turning Tool-Holder
Porte-Plaquettes tournage intérieur plaquettes positives S-STFC.-90°




**$D_{min}$ = Diám. mín. Int. Pieza** / Piece Int. min. Diam. / Diam. min intérieur pièce

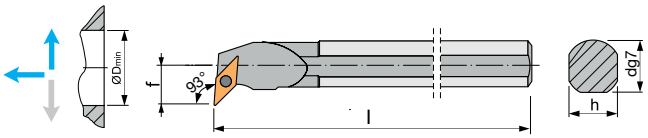
| | ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | d mm | f mm | h mm | l mm | $D_{min}$ mm | € | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| New! | S10M-STFCR09 | ● | 17134 | | | TC.. 0902.. | 10 | 7 | 9 | 150 | 13 | 102,21 | T-06 Art. 83748 3,20 € | 5 | ZT-06 Art. 83747 11,06 € | 1 |
| New! | S10M-STFCL09 | | | ● | 83743 | | 10 | 7 | 9 | 150 | 13 | 102,21 | | | | |
| | S12M-STFCR11 | ● | 18761 | | | TC.. 1102.. | 12 | 9 | 11 | 150 | 16 | 110,60 | T-07 Art. 10846 3,20 € | 5 | ZT-07 Art. 19569 11,06 € | 1 |
| | S12M-STFCL11 | | | ● | 18791 | | 12 | 9 | 11 | 150 | 16 | 110,60 | | | | |
| | S25T-STFCR16 | ● | 18789 | | | TC.. 16T3.. | 25 | 17 | 23 | 300 | 32 | 159,15 | T-15 Art. 10895 3,42 € | 5 | ZT-15 Art. 10512 11,06€ | 1 |
| | S25T-STFCL16 | | | ● | 18804 | | 25 | 17 | 23 | 300 | 32 | 159,15 | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 541**

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

# Ref. 8768

## PORTA-PLAQUITAS TORNEADO INTERIOR PLAQUITAS POSITIVAS S-SVUC.-93°
S-SVUC.-93° Positive Inserts Internal Turning Tool-Holder
Porte-Plaquettes tournage intérieur plaquettes positives S-SVUC.-93°




**$D_{min}$ = Diám. mín. Int. Pieza** / Piece Int. min. Diam. / Diam. min intérieur pièce

| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | d mm | f mm | h mm | l mm | $D_{min}$ mm | € | Ref. 8815 | | Ref. 8816 | | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S16R-SVUCR11 | ● | 19455 | | | VC.. 1103.. | 16 | 11 | 15 | 200 | 20 | 115,18 | | | | | T-07 Art. 10846 3,20 € | 5 | ZT-07 Art. 19569 11,06 € | 1 |
| S16R-SVUCL11 | | | ● | 19456 | | 16 | 11 | 15 | 200 | 20 | 115,18 | | | | | | | | |
| S25T-SVUCR16 | ● | 19457 | | | VC.. 1604.. | 25 | 17 | 23 | 300 | 32 | 175,31 | 6,7x 26×8,4 Art. 10865 10,53 € | 5 | M3,5×0,6x M5×0,5 x8,5×5xø6,25 Art. 29959 8,44 € | 5 | T-15 Art. 10847 3,42€ | 5 | ZT-16 Art. 10856 11,06 € | 1 |
| S25T-SVUCL16 | | | ● | 10910 | | 25 | 17 | 23 | 300 | 32 | 175,31 | | | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 545**

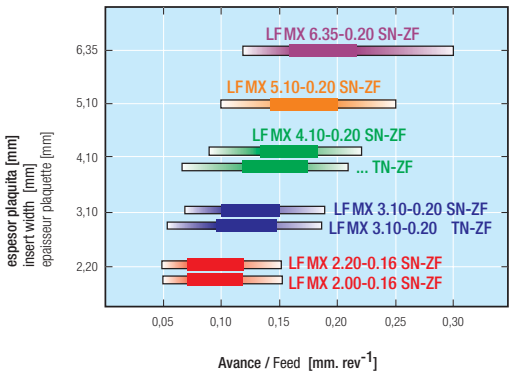
| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque de base |
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

# TRONZADO Y RANURADO
## Parting & Grooving
## Tonçonnage et rainurage

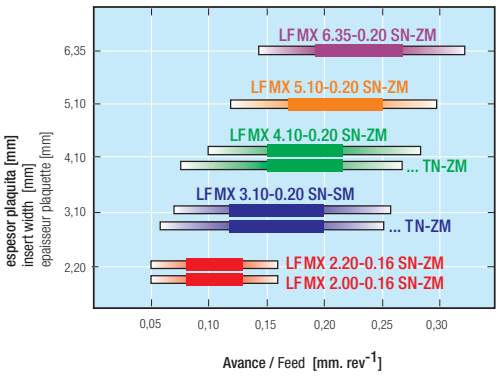
## PLAQUITAS INTERCAMBIABLES TRONZADO Y RANURADO
Parting & Grooving Indexable Inserts
Plaquettes interchangeables tronçonnage et rainurage

### VELOCIDADES DE CORTE RECOMENDADAS PARA TRONZADO Y RANURADO
**Recommended Cutting Speeds for Parting and Grooving**
Vitesses de coupe conseillées pour tronçonnage et rainurage

**ZF** Tronzado y ranurado exterior
External parting and grooving
Tronçonnage et rainurage extérieur




**ZM** Tronzado y ranurado exterior
External parting and grooving
Tronçonnage et rainurage extérieur




### VELOCIDADES INICIALES RECOMENDADAS TRONZADO Y RANURADO EXTERIOR
**Recommended initial Speeds for External Parting & Grooving**
Vitesses initiales conseillées tronçonnage et rainurage

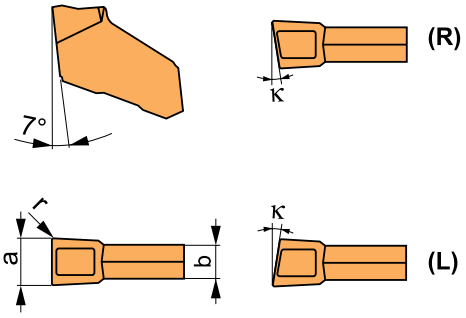
| Grad. | P | M | K | S | N-Al | N-Cu | H |
|---|---|---|---|---|---|---|---|
| C-540 | 120-230 | 70-120 | 60-120 | - | - | - | - |
| P-625 | 110-220 | 60-115 | 55-110 | - | - | 80-120 | - |

### VC. INICIALES RECOMENDADAS PARA RANURADO
**Recommended initial Speeds for Grooving**
Vc initiales conseillées pour rainurage

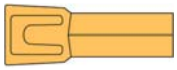
| Grad. | P | M | K | S | N-Al | N-Cu | H |
|---|---|---|---|---|---|---|---|
| C-540 | 90-160 | 50-100 | 40-90 | - | - | - | - |
| P-625 | 80-130 | 40-85 | 40-80 | - | - | - | - |

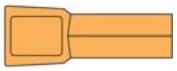
# Ref. 8600

## PLAQUITA INTERCAMBIABLE TRONZADO Y RANURADO LFMX
LFMX Parting & Grooving Indexable Insert
Plaquette tronçonnage et rainurage LFMX




| ISO | Dimensiones Dimensions a ±0,06 mm | b mm | r mm | k° | | N° Art. C-540 | N° Art. P-625 | € |
|---|---|---|---|---|---|---|---|---|
| **Corte continuo - Constant cut -** Coupe constante | | | | | | | | |
| **LFMX-2.00-0.16-SN-ZF** | 2,00 | 1,60 | 0,16 | | 10 | 29981 | 13418 | **13,84** |
| **LFMX-3.10-0.20-SN-ZF** | 3,10 | 2,60 | 0,20 | | 10 | 13421 | 13423 | **14,75** |
| **LFMX-3.10-0.20-TN-ZF** | 3,10 | 2,60 | 0,20 | | 10 | 30441 | 13429 | **14,75** |
| **Corte interrumpido - Interrupted cut -** Coupe interrompue | | | | | | | | |
| **LFMX-2.00-0.16-SN-ZM** | 2,00 | 1,60 | 0,16 | | 10 | 30153 | 13420 | **13,84** |
| **LFMX-3.10-0.20-SN-ZM** | 3,10 | 2,60 | 0,20 | | 10 | 30154 | 13424 | **14,75** |
| **LFMX-3.10-0.20-SL-ZM** | 3,10 | 2,60 | 0,20 | 8 | 10 | | 13426 | **14,75** |
| **LFMX-3.10-0.20-SR-ZM** | 3,10 | 2,60 | 0,20 | 8 | 10 | | 13427 | **14,75** |
| **LFMX-3.10-0.20-TN-ZM** | 3,10 | 2,60 | 0,20 | | 10 | 30448 | 13430 | **14,75** |
| **LFMX-4.10-0.20-SN-ZM** | 4,10 | 3,60 | 0,20 | | 10 | 13432 | 13433 | **16,03** |
| **LFMX-4.10-0.20-SL-ZM** | 4,10 | 3,60 | 0,20 | 8 | 10 | | 13435 | **16,03** |
| **LFMX-4.10-0.20-SR-ZM** | 4,10 | 3,60 | 0,20 | 8 | 10 | | 13436 | **16,03** |





**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8600 LFMX-2,00-0,16-SN-ZF C-540**

**Porta Plaquitas** / Tool Holder
Porte-Plaquettes: **Pag. 576, 577**

**SN**

**Geometría idonea para aceros al carbono, fundición y piezas forjadas.**
**Ideal geometry for carbon steels, cast iron & forged pieces.**
Géométrie idéal pour aciers carbure, fonte et pièces forgés.

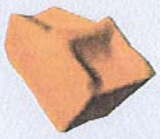
**TN**

**Geometría idonea para aluminio, cobre y aleaciones de titanio.**
**Ideal geometry for aluminium, copper & titanium alloys.**
Géométrie idéal pour aluminium, cuivre et alliages de titane.

**ZF**

**Rompevirutas ZF para tronzado y ranurado en acero y fundición. Para corte continuo.**
**ZF Chipbreaker for parting & grooving in steel & cast iron. For constant cut.**
Brisecopeaux ZF pour tronçonnage et rainurage en acier et fonte. Pour coupe constante.

**ZM**

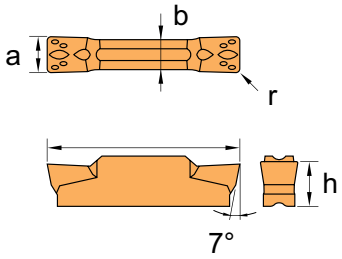


**Rompevirutas ZM para tronzar aceros de baja aleación e INOX austenítico. Corte interrumpido moderado.**
**ZM Chipbreaker for parting in low alloy steel & austenitic stainless. Reasonably interrupted cut.**
Brisecopeaux ZM pour tronçonnage aciers de faible alliage et INOX Austénitique. Coupe raisonnablement interrompue.

# Ref. 8601

## PLACA INTERCAMBIABLE TRONZADO Y RANURADO MGMN
MGMN Parting & Grooving Indexable Insert
Plaquette tronçonnage et rainurage MGMN

New!

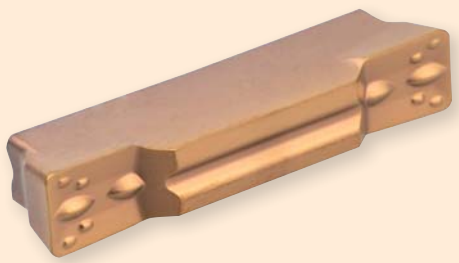



| ISO | a mm | b mm | l mm | h mm | r mm | | N° Art. P-625 | N° Art. P-640 | € |
|---|---|---|---|---|---|---|---|---|---|
| **MGMN-2.00-0.20-GC-ZF** | 2 | 1,60 | 16 | 3,50 | 0,20 | 10 | 12708 | 19184 | **15,98** |
| **MGMN-3.00-0.40-GC-ZF** | 3 | 2,35 | 21 | 4,80 | 0,40 | 10 | 12712 | 19188 | **17,07** |
| **MGMN-4.00-0.40-GC-ZF** | 4 | 3,30 | 21 | 4,80 | 0,40 | 10 | 12713 | 19190 | **17,57** |

*** Recomendamos la calidad P-625 para corte continuo y la calidad P-640 para corte discontinuo**
* We recommend grade P-625 for continuous cutting and grade P-640 for interrupted cutting
* Nous recommandons le degré P-625 pour une coupe continue et le degré P-640 pour une coupe interrompue

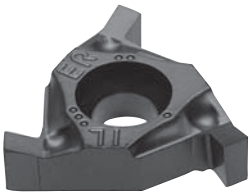
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8601 MGMN-2.00-0.20-GC-ZF P-625**

**Porta Plaquitas** / Tool Holder
Porte-Plaquettes: **Pag. 578**

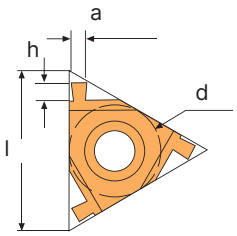


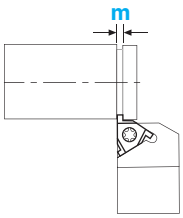
# Ref. 8603

## PLAQUITA INTERCAMBIABLE RANURADO EXTERIOR TN..ER.A
TN..ER.A External Grooving Indexable Insert
Plaquette rainurage extérieur TN..ER.A



EXT. **RANURADO Seeger®**
**Grooving Seeger®**
Rainurage Seeger®




| ISO * ER=IL | DIN 471 m mm (min.) | Dimensiones Dimensions d mm | l mm | a mm | h mm | | N° Art. P-625 | € |
|---|---|---|---|---|---|---|---|---|
| **TN-16-ER-A-100** | **0,90** | 9,525 | 16,00 | 1,00 | 1,40 | 10 | 79738 | **25,44** |
| **TN-16-ER-A-120** | **1,10** | 9,525 | 16,00 | 1,20 | 1,60 | 10 | 79739 | **25,44** |
| **TN-16-ER-A-140** | **1,30** | 9,525 | 16,00 | 1,40 | 1,80 | 10 | 79740 | **25,44** |
| **TN-16-ER-A-170** | **1,60** | 9,525 | 16,00 | 1,70 | 2,00 | 10 | 79741 | **25,44** |
| **TN-16-ER-A-195** | **1,85** | 9,525 | 16,00 | 1,95 | 2,00 | 10 | 79742 | **25,44** |
| **TN-16-ER-A-225** | **2,15** | 9,525 | 16,00 | 2,25 | 2,25 | 10 | 79743 | **25,44** |

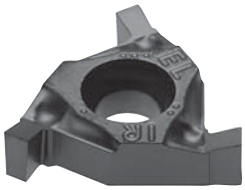
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8603 TN-16-ER-A-100 P-625**

**Porta Plaquitas** / Tool Holder
Porte-Plaquettes: **Pag. 588**

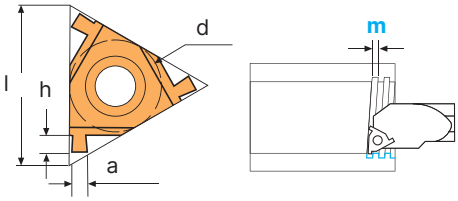
*** ER = IL** → **Exterior Derecha válida para Interior Izquierda**
Right External valid for Left Internal
Extérieur droit valide pour intérieur gauche

# Ref. 8606

## PLAQUITA INTERCAMBIABLE RANURADO INTERIOR TN..IR.A
TN..IR.A Internal Grooving Indexable Insert
Plaquette rainurage intérieur TN..IR.A



INT. **RANURADO Seeger®**
**Grooving Seeger®**
Rainurage Seeger®




| ISO * EL=IR | DIN 472 m mm (min.) | Dimensiones Dimensions d mm | l mm | a mm | h mm | | N° Art. P-625 | € |
|---|---|---|---|---|---|---|---|---|
| **TN-16-IR-A-100** | **0,90** | 9,525 | 16,00 | 1,00 | 1,40 | 10 | 79748 | **25,44** |
| **TN-16-IR-A-120** | **1,10** | 9,525 | 16,00 | 1,20 | 1,60 | 10 | 79749 | **25,44** |
| **TN-16-IR-A-140** | **1,30** | 9,525 | 16,00 | 1,40 | 1,80 | 10 | 79750 | **25,44** |
| **TN-16-IR-A-170** | **1,60** | 9,525 | 16,00 | 1,70 | 2,00 | 10 | 79751 | **25,44** |
| **TN-16-IR-A-195** | **1,85** | 9,525 | 16,00 | 1,95 | 2,00 | 10 | 79752 | **25,44** |
| **TN-16-IR-A-225** | **2,15** | 9,525 | 16,00 | 2,25 | 2,25 | 10 | 79753 | **25,44** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8606 TN-16-IR-A-100 P-625**

**Porta Plaquitas** / Tool Holder
Porte-Plaquettes: **Pag. 588**

*** EL = IR** → **Exterior Izquierda válida para Interior Derecha**
Left External valid for Right Internal
Extérieur gauche valide pour intérieur droit

# Ref. 8605

## SET RANURADO SEEGER®
Grooving Set Seeger®
Jeu rainurage Seeger®

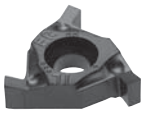
**Plaquitas especiales**
**para ranuras de anillos tipo Seeger®**

**Special inserts**
**for Seeger® type rings**

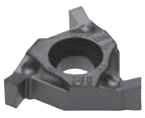
Plaquettes spéciales
pour bagues Seeger®

EXT.

INT.


ER=IL

**Ref. 8603**
**RANURADO EXTERIOR**
**External Grooving**
Rainurage extérieur


EL=IR

**Ref. 8606**
**RANURADO INTERIOR**
**Internal Grooving**
Rainurage intérieur

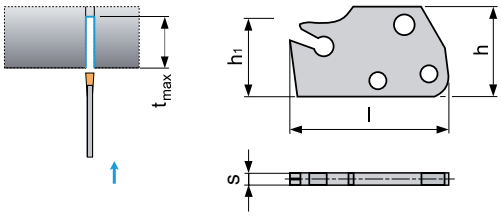
### Set 10 Pcs

| Cont | N° Art. | € |
|---|---|---|
| **Ref. 8603 EXT**<br>(DIN 471) - TN-16-ER-A<br>1,20 - 1,40 - 1,70<br>1,95 - 2,25<br><br>**Ref. 8606 INT**<br>(DIN 472) - TN-16-IR-A<br>1,20 - 1,40 - 1,70<br>1,95 - 2,25 | 79672 | **254,37** |

**Porta Plaquitas / Tool Holder / Porte-Plaquettes: Pag. 588**

# Ref. 8850

## LAMA PORTA-PLAQUITAS TRONZADO Y RANURADO XLCF
XLCF Parting & Grooving Tool-Holder Blade
Lame Porte-Plaquettes tronçonnage et rainurage XLCF



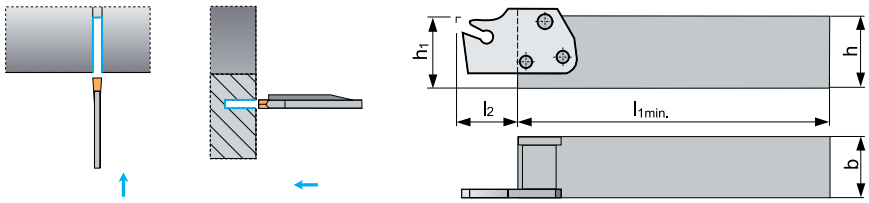

| ISO | N° Art. | | $h_1$ mm | h mm | l mm | s mm | $t_{max}$ mm | € |
|---|---|---|---|---|---|---|---|---|
| **XLCFR-160115-2** | 13543 | LFMX-2.00.... | 12,3 | 25 | 34 | 1,4 | 15 | **160,06** |
| **XLCFL-160115-2** | 13544 | | 12,3 | 25 | 34 | 1,4 | 15 | **160,06** |
| **XLCFN-160220-3** | 13549 | LFMX-3.10.... | 12,3 | 25 | 40 | 2,4 | 20 | **160,06** |
| **XLCFR-250115-2** | 13546 | LFMX-2.00.... | 24,0 | 29 | 40 | 1,4 | 15 | **175,94** |
| **XLCFL-250115-2** | 13547 | | 24,0 | 29 | 40 | 1,4 | 15 | **175,94** |
| **XLCFN-250225-3** | 13550 | LFMX-3.10.... | 24,0 | 29 | 50 | 2,4 | 25 | **175,94** |
| **XLCFN-250325-4** | 13552 | LFMX-4.10.... | 24,0 | 29 | 50 | 3,4 | 25 | **175,94** |

**XLCFN: Neutra Neutral** Neutre
**XLCFR: Derecha Right** Droite
**XLCFL: Izquierda Left** Gauche

**Plaquita** / Insert / Plaquette: **Pag. 572**

# Ref. 8860

## PORTA-PLAQUITAS TRONZADO Y RANURADO MS-EN
MS-EN Parting & Grooving Tool-Holder
Porte-Plaquettes tronçonnage et rainurage MS-EN



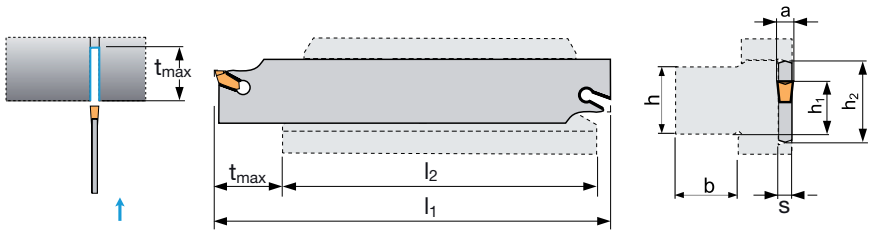

| ISO | N° Art. | | $h_1$ mm | h mm | b mm | $l_1$ mm | $l_2$ mm | € | | Ref. 8802 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MS-EN-1616-H** | 13553 | XLCF - 160115 / 160220 | 16 | 16 | 16 | 100 | 20 | **221,66** | **T-15 Ref. 8816** Art. 10895 **3,42 €** | 5 | - | | **ZT-1** Art. 10512 **11,06 €** | 1 |
| **MS-EN-2020-K** | 13555 | XLCF - 250115 / 250225 | 20 | 20 | 20 | 125 | 25 | **247,25** | **ZUS-45 Ref. 8802** Art. 13852 **7,94 €** | 5 | **ZUS-46** Art. 13853 **7,94 €** | 5 | **ZT-20** Art. 13845 **11,06 €** | 1 |
| **MS-EN-2525-M** | 13556 | XLCF - 25..15 / 25..25 | 25 | 25 | 25 | 150 | 25 | **252,73** | | | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 572**

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

# Ref. 8870

## LAMA PORTA-PLAQUITAS TRONZADO Y RANURADO XLCFN
XLCFN Parting & Grooving Tool-Holder Blade
Lame Porte-Plaquettes tronçonnage et rainurage XLCFN

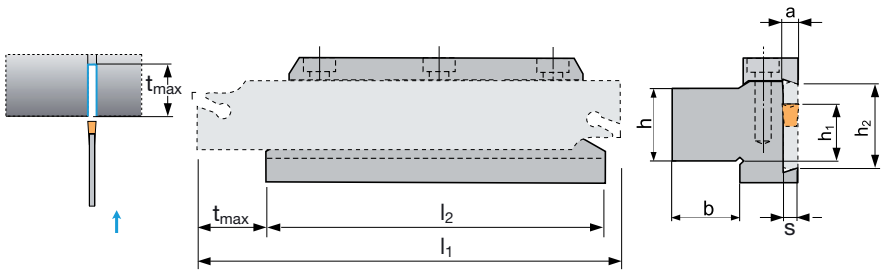



| ISO | N° Art. | | $h_1$ mm | $h_2$ mm | $l_1$ mm | s mm | $t_{max}$ mm | € |
|---|---|---|---|---|---|---|---|---|
| **XLCFN-2601-J-2.00** | 13558 | LFMX-2.00.... | 20 | 26 | 110 | 1,6 | 25 | **160,06** |
| **XLCFN-2602-J-3.00** | 13561 | LFMX-3.10.... | 20 | 26 | 110 | 2,4 | 40 | **160,06** |
| **XLCFN-2603-J-4.00** | 13564 | LFMX-4.10.... | 20 | 26 | 110 | 3,4 | 40 | **160,06** |
| **XLCFN-3201-M-2.00** | 13565 | LFMX-2.00.... | 25 | 32 | 150 | 1,6 | 25 | **175,94** |
| **XLCFN-3202-M-3.00** | 13567 | LFMX-3.10.... | 25 | 32 | 150 | 2,4 | 50 | **175,94** |
| **XLCFN-3203-M-4.00** | 13568 | LFMX-4.10.... | 25 | 32 | 150 | 3,4 | 50 | **175,94** |

**Plaquita** / Insert / Plaquette: **Pag. 572**

# Ref. 8875

## PORTA-PLAQUITAS TRONZADO Y RANURADO XLCFN
XLCFN Parting & Grooving Tool-Holder
Porte-Plaquettes tronçonnage et rainurage XLCFN



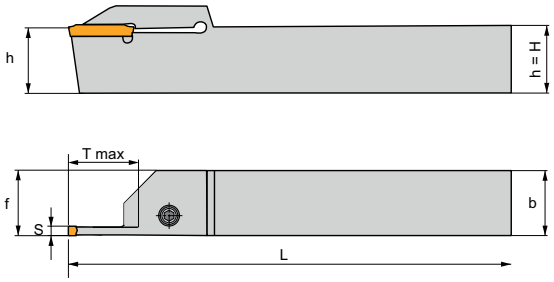

| ISO | N° Art. | | $h_1$ mm | $h_2$ mm | b mm | $l_2$ mm | € | Ref. 8802 | |
|---|---|---|---|---|---|---|---|---|---|
| **26-DU-2020** | 13570 | XLCFN-26.... | 20 | 26 | 20 | 90 | **326,89** | **ZM-6X20** Art. 13849 **0,75 €** | 5 |
| **32-DU-2532** | 13571 | XLCFN-32.... | 25 | 32 | 25 | 110 | **344,09** | | |

**Plaquita** / Insert / Plaquette: **Pag. 572**

**Tornillo** - Screw - Vis

# Ref. 8865

## PORTA-PLAQUITAS TRONZADO Y RANURADO XMCG
XMCG Parting & Grooving Tool-Holder Blade
Porte plaquettes tronçonnage et rainurage XMCG




| ISO | R Dcha. | N° Art. | L Izda. | N° Art. | | H mm | b mm | f mm | S mm | L mm | Tmax mm | € | Ref. 8816 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **XMCGR-1212-K-2.00** | ● | 24534 | | | MGMN-2.00.... | 12 | 12 | 12 | 2 | 125 | 16 | **113,15** | **M5×16** Art. 19194 **7,94 €** | 5 |
| **XMCGL-1212-K-2.00** | | | ● | 70269 | | 12 | 12 | 12 | 2 | 125 | 16 | **113,15** | | |
| **XMCGR-1616-K-2.00** | ● | 12727 | | | | 16 | 16 | 16 | 2 | 125 | 16 | **119,80** | | |
| **XMCGL-1616-K-2.00** | | | ● | 20052 | | 16 | 16 | 16 | 2 | 125 | 16 | **119,80** | | |
| **XMCGR-1616-K-3.00** | ● | 19699 | | | MGMN-3.00.... | 16 | 16 | 16 | 3 | 125 | 18 | **120,02** | | |
| **XMCGL-1616-K-3.00** | | | ● | 19700 | | 16 | 16 | 16 | 3 | 125 | 18 | **120,02** | | |
| **XMCGR-2020-K-3.00** | ● | 12729 | | | | 20 | 20 | 20 | 3 | 125 | 18 | **122,24** | **M5×20** Art. 19196 **7,94 €** | 5 |
| **XMCGL-2020-K-3.00** | | | ● | 20060 | | 20 | 20 | 20 | 3 | 125 | 18 | **122,24** | | |
| **XMCGR-2020-M-4.00** | ● | 70280 | | | MGMN-4.00.... | 20 | 20 | 20 | 4 | 150 | 18 | **122,46** | | |
| **XMCGL-2020-M-4.00** | | | ● | 70272 | | 20 | 20 | 20 | 4 | 150 | 18 | **122,46** | | |
| **XMCGR-2525-M-4.00** | ● | 12730 | | | | 25 | 25 | 25 | 4 | 150 | 18 | **124,68** | **M6×20** Art. 19216 **7,94 €** | 5 |
| **XMCGL-2525-M-4.00** | | | ● | 20067 | | 25 | 25 | 25 | 4 | 150 | 18 | **124,68** | | |

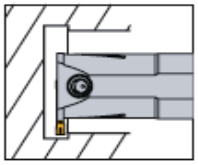
**Plaquita** / Insert / Plaquette: **Pag. 573**

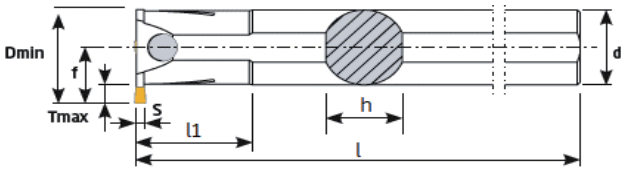
**Tornillo** - Screw - Vis

# Ref. 8866

## PORTA-PLAQUITAS DE RANURADO INTERIOR S-GMGG
S-GMGG Internal Grooving Tool-Holder
Porte-plaquettes rainurage intérieur S-GMGG

New!



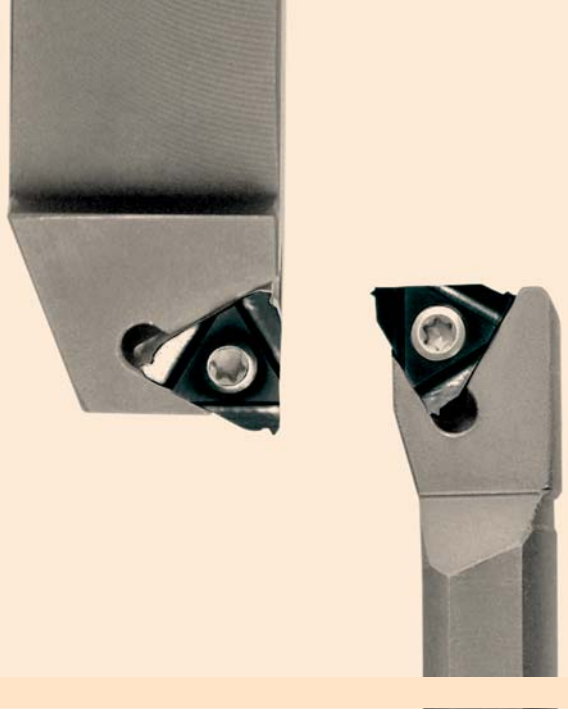



| ISO | R Dcha. | N° Art. | | d mm | h mm | f mm | l mm | l1 mm | Dmin mm | Tmax mm | s mm | € | Ref. 8816 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **S16Q-GMGGR02** | ● | 25493 | MGMN-2.00.... | 16 | 15 | 12,50 | 180 | 35 | 21 | 5,00 | 2 | **111,37** | **M5×12** Art. 25531 **7,94 €** | 5 |
| **S20Q-GMGGR03** | ● | 25494 | MGMN-3.00.... | 20 | 18 | 15,50 | 180 | 35 | 26 | 6,00 | 3 | **124,96** | | |
| **S25R-GMGGR03** | ● | 25504 | | 25 | 23 | 19,00 | 200 | 40 | 32 | 6,70 | 3 | **135,82** | **M5×16** Art. 19194 **7,94 €** | 5 |
| **S25R-GMGGR04** | ● | 25506 | MGMN-4.00.... | 25 | 23 | 18,20 | 200 | 40 | 31 | 6,00 | 4 | **135,82** | | |
| **S32S-GMGGR04** | ● | 25507 | | 32 | 30 | 21,50 | 250 | 60 | 38 | 6,00 | 4 | **152,12** | **M6×20** Art. 19216 **- 7,94 €** | 5 |

*** Portaplaquitas a izquierdas bajo demanda**
*** Left-Hand Tool-Holder upon request**
* Porte-plaquettes à gauche sur demande

**Plaquita** / Insert / Plaquette: **Pag. 573**

**Tornillo** - Screw - Vis

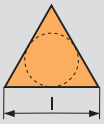
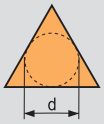


# ROSCADO
# Threading
# Taraudage

## CÓDIGOS ISO ELECCIÓN PLAQUITAS ROSCADO
Threading insert Choice ISO Codes
Codes ISO choix plaquettes taraudage

| 1 |
|---|
| **Forma Plaquita**<br>Insert Shape<br>Forme plaquette |
| |
| **T** |

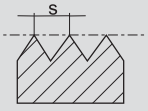
| 2 |
|---|
| **Angulo Incidencia**<br>Clearance Angle<br>Angle d'incidence |
| |
| **N** |

| 3 | |
|---|---|
| **Longitud Filo de Corte**<br>Cutting Edge Length<br>Longueur arête coupe | |
|  |  |
| 11 | 11,0 |
| 16 | 9,525 |
| 22 | 12,7 |

| 4 |
|---|
| **Exterior - Interior**<br>External - Internal<br>Extérieur - Intérieur |
| **Exterior** - External - Extérieur |
| **E** |
| **Interior** - Internal - Intérieur |
| **I** |

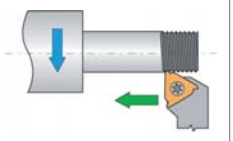
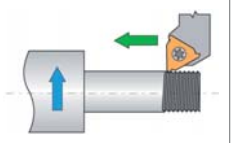
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| T | N | 16 | E | R | 175 | M |

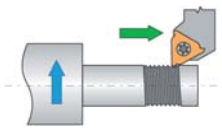
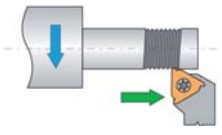
| 5 |
|---|
| **Tipo Plaquita**<br>Insert type<br>Type plaquette |
| **Dcha.** - Right - Droit |
| **R** |
| **Izda.** - Left - Gauche |
| **L** |
| **Neutra** - Neutral - Neutre |
| **N** |

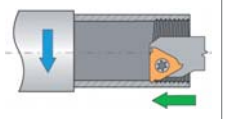
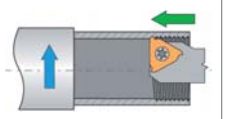
| 6 | |
|---|---|
| **Paso Rosca**<br>Thread pitch<br>Pas filetage | |
| **Paso Rosca**<br>Thread pitch<br>Pas filetage | **N.º Pasos / Pulgada**<br>Number of pitches per inch<br>Nombre Pas / Pouces |
|  <br>s x 100 | **N.º Pasos / Pulgada x 10**<br>Number of pitches per inch x 10<br>Nombre Pas / Pouces x 10 |

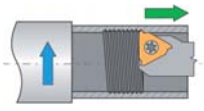
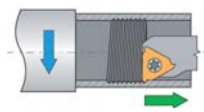
| 7 | |
|---|---|
| **Perfil Rosca**<br>Thread profile<br>Profil filetage | |
| **M** | **métrica** / metric / métrique<br>**60° ISO** |
| **W** | **Whitworth**<br>**55°** |

# TÉCNICAS PRODUCCIÓN Y AVANCE PLAQUITAS ROSCADO
## Threading Insert Production & Feed Techniques
## Téchniques production et avance plaquettes taraudage

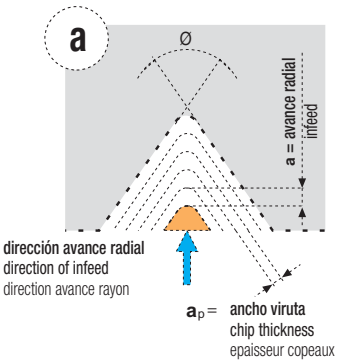
| | | |
|---|---|---|
| **Roscado hacia el Plato: Los apoyos originales sirven para la mayoría de las operaciones.**<br>**Threading through the Face Plate:** The original supports are suitable for most operations.<br>**Taraudage vers le plateau:** Les appuis originaux s´emploient dans la plupart des operations. | **Roscado Exterior Derecha**<br>**External Right Threading**<br>Taraudage Extérieur Droite |  |
| | **Roscado Exterior Izquierda**<br>**External Left Threading**<br>Taraudage Extérieur Gauche |  |

| | | |
|---|---|---|
| **Roscado desde el Plato**<br>Threading from the Face Plate<br>Taraudage depuis le plateau | **Roscado Exterior Derecha**<br>**External Right Threading**<br>Taraudage Extérieur Droite |  |
| | **Roscado Exterior Izquierda**<br>**External Left Threading**<br>Taraudage Extérieur Gauche |  |

| | | |
|---|---|---|
| **Roscado hacia el Plato: Los apoyos originales sirven para la mayoría de las operaciones.**<br>**Threading through the Face Plate:** The original supports are suitable for most operations.<br>**Taraudage vers le plateau:** Les appuis originaux s´emploient dans la plupart des operations. | **Roscado Interior Derecha**<br>**Internal Right Threading**<br>Taraudage Intérieur Droite |  |
| | **Roscado Interior Izquierda**<br>**Internal Left Threading**<br>Taraudage Intérieur Gauche |  |

| | | |
|---|---|---|
| **Roscado desde el Plato: La viruta se evacua correctamente hacia el exterior.**<br>**Threading from the Face Plate:** Good chipping-off through the outside.<br>**Taraudage depuis le plateau:** Les copeaux s´évacuent correctemment vers l´extérieur. | **Roscado Interior Derecha**<br>**Internal Right Threading**<br>Taraudage Intérieur Droite |  |
| | **Roscado Interior Izquierda**<br>**Internal Left Threading**<br>Taraudage Intérieur Gauche |  |

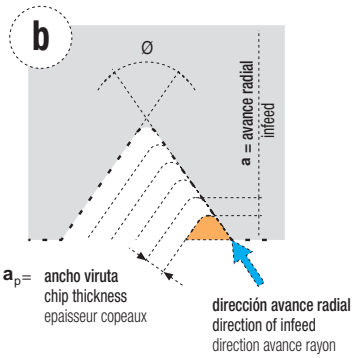
**Existen diferentes Técnicas de Avance:** **a) Avance Radial** **b) Avance Lateral** **c) Avance Lateral Modificado** **d) Avance Alternativo**
**There are different Infeed Techniques:** **a) Radial Infeed** **b) Side Infeed** **c) Modified Side Infeed** **d) Alternate Infeed**
Ils existent Différentes types d´avance: a) Avance rayon b) Avance latéral c) Avance latéral modifié d) Avance altérnatif




**El metodo más común, para máquinas convencionales. 1ª elección en materiales que se auto-endurecen al ser mecanizados, p.e. INOX austenítico.**

Commonest technique, for conventional machines. 1st choice in auto-hardened materials while machining, f.e. austenitic stainless.

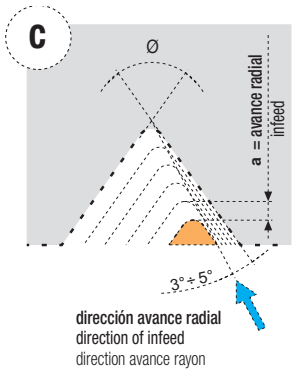
La méthode la plus employée pour machines conventionnelles. 1er Choix pour matériaux qui augmentent sa dureté sur l´usinage, Par example. INOX Austénitique.




**Para máquinas convencionales y CNC, buen control de viruta y no apropiado para materiales que se auto-endurecen.**

For conventional & CNC machines, good chip-control & not suitable for auto-hardened materials.

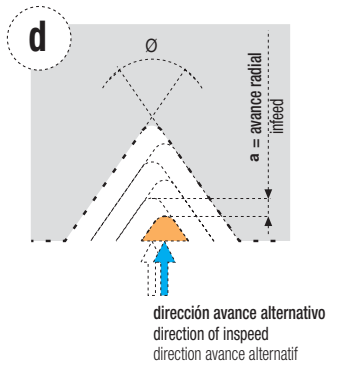
Pour machines conventionnelles et CNC, bon contrôle des copeaux et pas convenable pour matériaux qui augmentent eux même sa dureté.




**Buen control de viruta, adecuada para roscas de grandes pasos e interiores. Para evitar un excesivo desgaste por el roce del filo posterior, el áng. de avance debe ser 3-5° menor que el áng. de rosca.**

Good chip-control, suitable for internal & large pitch threads. To avoid an excessive wear due to the back edge friction, feed angle should be 3-5° smaller than thread angle.

Bon Contrôle des copeaux, Idéale pour taraudages grands pas e intérieurs. Pour éviter une excesive usure du au filet postérieur, l´angle d´avance doit être 3-5° inférieur que l´angle de taraudage.




**Permite un desgaste uniforme de la plaquita e incrementa su vida. 1ª opción en roscas de paso grande.**

Allows a uniform insert wear and in-creases its life. 1st choice in big pitch threads.

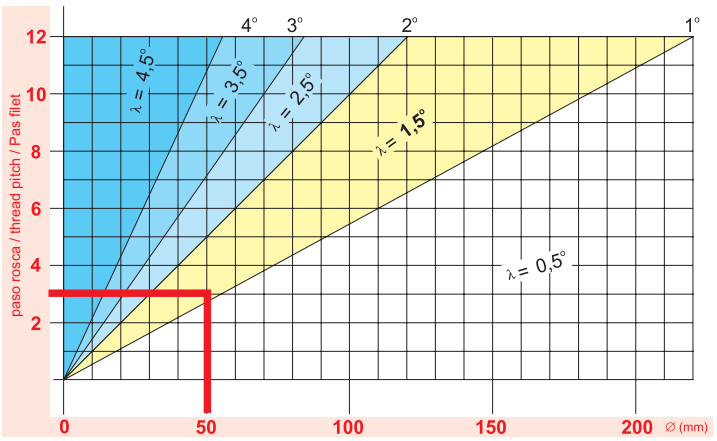
Permet une usure uniforme de la plaquette et augmente sa vie utile. 1ere option pour taraudages avec pas grand.

# ELECCIÓN ANGULO INCLINACIÓN Y VC PLAQUITAS ROSCADO
## Threading Insert Inclination Angle & Vc Choice
## Choix angle inclinaison & Vc plaquettes taraudage

**Las placas de apoyo para los portas de roscado tienen una inclinación de 1,5°, que sirven para la mayoría de los pasos de roscado, como se indica en el diagrama inferior.**
**Ejemplo: Diámetro torneado 50 mm + Paso 3 mm = Placa apoyo 1,5°**
**Las placas de apoyo que no se correspondan con estos grados de inclinación se servirán bajo demanda.**

Shims for threading tool-holders have an **inclination of 1,5°**, that make them suitable for most threading pitches, as showed in the diagram below.
**Example:** Turning diameter 50 mm + Pitch 3 mm = Shim 1,5°
Shims that do not belong to these inclination grades will be served upon request.

Les plaques d´appui pour les porte-outils taraudage ont une **inclinaison de 1.5°**, qui s´emploient pour la plupart des pas de taraudage, comme on indique sur le diagramme.
**Exemple:** Diamètre tournage 50 mm + Pas 3 mm : Plaque d´appui 1,5°
Les plaques d´appui qui ne se correspondent avec ces degrès d´inclinaison seront livrées à la demande.

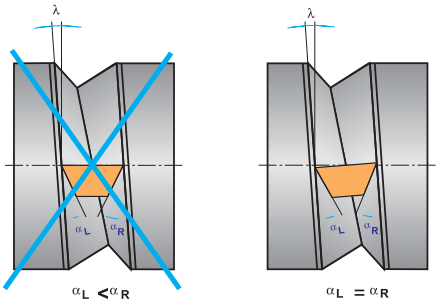



| Angulo Inclinación<br>Inclination Angle<br>Angle d´inclinaison | Positivo Positive | | | | | Negativo Negative | |
|---|---|---|---|---|---|---|---|
| | 4,5° | 3,5° | 2,5° | 1,5° | 0,5° | -0,5° | -1,5° |
| **Porta-Roscado**<br>**Threading Tool** - Mandrin-Filetage | **Placa Apoyo**<br>**Shim Plaque** - Plaque d´appui | | | | | | |
| SER .... .16 SIL .... .16 | PE16+4,5 | PE16+3,5 | PE16+2,5 | PE16+1,5 | PE16+0,5 | PE16-0,5 | PE16-1,5 |
| SEL .... .16 SIR .... .16 | PI16+4,5 | PI16+3,5 | PI16+2,5 | PI16+1,5 | PI16+0,5 | PI16-0,5 | PI16-1,5 |
| SER .... .22 SIL .... .22 | PE22+4,5 | PE22+3,5 | PE22+2,5 | PE22+1,5 | PE22+0,5 | PE22-0,5 | PE22-1,5 |
| SEL .... .22 SIR .... .22 | PI22+4,5 | PI22+3,5 | PI22+2,5 | PI22+1,5 | PI22+0,5 | PI22-0,5 | PI22-1,5 |
| SER-S .... .16 SIL .... .16 | PE16S+4,5 | PE16S+3,5 | PE16S+2,5 | PE16S+1,5 | PE16S+0,5 | PE16S-0,5 | PE16S-1,5 |
| SEL-S .... .16 SIR .... .16 | PI16S+4,5 | PI16S+3,5 | PI16S+2,5 | PI16S+1,5 | PI16S+0,5 | PI16S-0,5 | PI16S-1,5 |
| SER-S .... .16 SIL .... .16 | PE22S+4,5 | PE22S+3,5 | PE22S+2,5 | PE22S+1,5 | PE22S+0,5 | PE22S-0,5 | PE22S-1,5 |
| SEL-S .... .16 SIR .... .16 | PI22S+4,5 | PI22S+3,5 | PI22S+2,5 | PI22S+1,5 | PI22S+0,5 | PI22S-0,5 | PI22S-1,5 |

## APOYO PLAQUITA
### Insert Setting - Appui plaquette

**¡Incorrecto!**
**Wrong! Incorrect!**

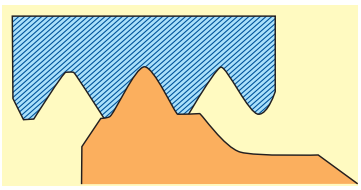
**Correcto**
**Correct**



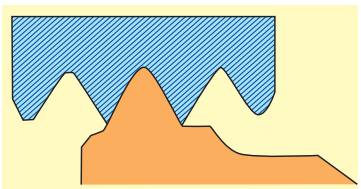

**Para obtener un perfil de rosca correcto y un desgaste uniforme de la plaquita, el ángulo de inclinación del filo de corte debe ser igual al ángulo de la hélice.**

In order to obtain a correct thread profile and an insert uniform wear, the cutting edge inclination angle should be the same as the helix angle.

Pour obtenir un profil de taraudage correct et une usure uniforme de la plaquette, l´angle d´inclinaison du filet de coupe doit être égal à l´angle d´hélice.



**Perfil Total: Hace la rosca completa sin rebaba, solo se necesita una herramienta y a la pieza no le hace falta ser premecanizada al diámetro exacto.**
**Full Profile:** It makes the whole thread without burrs, only one tool is needed and the piece does not need premachining the exact diameter.
**Profil total:** Permet que le filetage soit complet et sans bavures, seulement on a besoin d´un outil et que la pièce ne soit pas usinée au diamètre exact.



**Perfil Parcial: Cubre una amplio gama de diferentes pasos. Se requiere que la pieza a roscar tenga un diámetro correcto.**
**Partial Profile:** It covers a wide range of different pitches. It is needed the thread-piece to have a correct diameter.
**Profil parciel:** Couvre une gamme longue de différents pas. On a besoin que la pièce à tarauder soit usinée au diamètre exact.

## VELOCIDADES INICIALES DE CORTE RECOMENDADAS
### Recommended Initial Cutting Speeds
### Vitesses de coupe initiales recommandées

| Grados Recubiertos<br>Coated Grades Degré revêtements | P-620 | | | | | |
|---|---|---|---|---|---|---|
| **Tipo Plaquita**<br>**Insert Type** - Type plaquette | P | M | K | S | N | H |
| TN. | 120 - 160 | 110 - 130 | 120 - 150 | 10 - 20 | 200 - 300 | 30 - 45 |

# DATOS CORTE ROSCADO
Threading Cutting Data
Données coupe taraudage

- **No conviene hacer una rosca de una sola pasada a causa de la fragilidad del filo de corte.**
- **Debe dividirse la profundidad total en varias pasadas.**
- **Todas las pasadas deben llevar una misma área de viruta.**
- **Seguir las recomendaciones de las tablas en esta misma página para encontrar el correcto numero de pasadas y la profundidad de cada una, tanto en roscado exterior como interior.**
- **En ningun caso las pasadas deben ser inferiores a 0,05 mm.**

- Threads should not be made just by one infeed due to the edge fragility.
- Total Depth should be divided into some infeeds.
- Every infeed should obtain the same chipping volume.
- Follow this same page tables in order to find the correct number of infeeds and their depths, both in external or internal threading.
- Never make an infeed smaller than 0,05 mm.

- Pas faire un taraudage d´une seule passade à cause de la fragilité du filet de coupe.
- Pas diviser la proffondeur totale en diffèrentes passades.
- Toutes les passades doivent évacuer une même quantité de copeaux.
- Suivre les conseils des tableaux sur cette page pour trouver le nombre correct de passades et leur proffondeur en taraudage extérieur et intérieur.
- En aucun cas, les passades doivent être inférieures à 0.05 mm.

## Rosca ISO Métrica Interna
## Internal Metric ISO Thread Taraudage ISO métrique interne

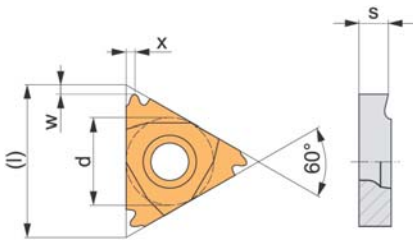
| **N° Pasadas** N° Infeed N° Passades | **reduzca la velocidad de corte proporcionalmente al incremento del paso** reduce cutting speed proportionally to increasing the thread pitch réduisez la vitesse de coupe en proportion à l´augmentation du pas | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **paso (mm)** pitch pas | **0,50** | **0,75** | **1,00** | **1,25** | **1,50** | **1,75** | **2,00** | **2,50** | **3,00** | **3,50** | **4,00** | **4,50** | **5,00** | **5,50** | **6,00** |
| | **Avance Radial (mm) Radial Infeed (mm)** Avance Rayon (mm) | | | | | | | | | | | | | | |
| **1** | 0,11 | 0,17 | 0,19 | 0,20 | 0,22 | 0,22 | 0,25 | 0,27 | 0,28 | 0,32 | 0,33 | 0,36 | 0,41 | 0,41 | 0,44 |
| **2** | 0,09 | 0,14 | 0,16 | 0,17 | 0,21 | 0,21 | 0,23 | 0,25 | 0,26 | 0,30 | 0,31 | 0,33 | 0,38 | 0,38 | 0,41 |
| **3** | 0,07 | 0,10 | 0,11 | 0,13 | 0,15 | 0,15 | 0,17 | 0,18 | 0,20 | 0,23 | 0,24 | 0,27 | 0,30 | 0,32 | 0,35 |
| **4** | 0,07 | 0,07 | 0,09 | 0,10 | 0,13 | 0,13 | 0,14 | 0,15 | 0,16 | 0,19 | 0,21 | 0,23 | 0,25 | 0,26 | 0,28 |
| **5** | 0,34 | 0,48 | 0,08 | 0,09 | 0,11 | 0,10 | 0,12 | 0,13 | 0,14 | 0,17 | 0,18 | 0,21 | 0,22 | 0,22 | 0,24 |
| **6** | | | 0,63 | 0,08 | 0,08 | 0,09 | 0,11 | 0,12 | 0,13 | 0,15 | 0,15 | 0,19 | 0,20 | 0,20 | 0,22 |
| **7** | | | | 0,77 | 0,90 | 0,09 | 0,10 | 0,11 | 0,13 | 0,14 | 0,14 | 0,16 | 0,17 | 0,18 | 0,20 |
| **8** | | | | | | 0,08 | 0,08 | 0,10 | 0,11 | 0,13 | 0,13 | 0,15 | 0,16 | 0,17 | 0,19 |
| **9** | | | | | | 1,07 | 1,20 | 0,10 | 0,10 | 0,12 | 0,12 | 0,14 | 0,15 | 0,16 | 0,18 |
| **10** | | | | | | | | 0,08 | 0,10 | 0,11 | 0,12 | 0,13 | 0,15 | 0,15 | 0,16 |
| **11** | | | | | | | | 1,49 | 0,09 | 0,10 | 0,11 | 0,12 | 0,14 | 0,14 | 0,15 |
| **12** | | | | | | | | | 0,08 | 0,08 | 0,10 | 0,12 | 0,14 | 0,14 | 0,15 |
| **13** | | | | | | | | | 1,77 | 2,04 | 0,10 | 0,11 | 0,12 | 0,13 | 0,14 |
| **14** | | | | | | | | | | | 0,08 | 0,10 | 0,10 | 0,12 | 0,13 |
| **15** | | | | | | | | | | | 2,32 | 2,62 | 2,89 | 0,12 | 0,12 |
| **16** | | | | | | | | | | | | | | 0,10 | 0,10 |
| | **Profundidad Total Total Depth** Profondeur Totale: | | | | | | | | | | | | | **3,20** | **3,46** |

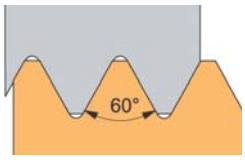
## Rosca ISO Métrica Externa
## External Metric ISO Thread Taraudage ISO métrique externe

| **N° Pasadas** N° Infeed N° Passades | **reduzca la velocidad de corte proporcionalmente al incremento del paso** reduce cutting speed proportionally to increasing the thread pitch réduisez la vitesse de coupe en proportion à l´augmentation du pas | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **paso (mm)** pitch pas | **0,50** | **0,75** | **1,00** | **1,25** | **1,50** | **1,75** | **2,00** | **2,50** | **3,00** | **3,50** | **4,00** | **4,50** | **5,00** | **5,50** | **6,00** |
| | **Avance Radial (mm) Radial Infeed (mm)** Avance Rayon (mm) | | | | | | | | | | | | | | |
| **1** | 0,11 | 0,17 | 0,19 | 0,20 | 0,22 | 0,22 | 0,25 | 0,27 | 0,28 | 0,34 | 0,34 | 0,37 | 0,41 | 0,43 | 0,46 |
| **2** | 0,09 | 0,15 | 0,16 | 0,17 | 0,21 | 0,21 | 0,24 | 0,25 | 0,26 | 0,31 | 0,32 | 0,34 | 0,39 | 0,40 | 0,43 |
| **3** | 0,07 | 0,11 | 0,13 | 0,14 | 0,17 | 0,17 | 0,18 | 0,19 | 0,21 | 0,25 | 0,25 | 0,28 | 0,32 | 0,32 | 0,35 |
| **4** | 0,07 | 0,07 | 0,11 | 0,11 | 0,14 | 0,14 | 0,16 | 0,17 | 0,18 | 0,21 | 0,22 | 0,24 | 0,27 | 0,27 | 0,30 |
| **5** | 0,34 | 0,48 | 0,08 | 0,10 | 0,12 | 0,12 | 0,14 | 0,15 | 0,16 | 0,18 | 0,19 | 0,22 | 0,24 | 0,24 | 0,27 |
| **6** | | | 0,67 | 0,08 | 0,08 | 0,10 | 0,12 | 0,13 | 0,14 | 0,17 | 0,17 | 0,20 | 0,22 | 0,22 | 0,24 |
| **7** | | | | 0,80 | 0,94 | 0,10 | 0,11 | 0,12 | 0,13 | 0,15 | 0,16 | 0,18 | 0,20 | 0,20 | 0,22 |
| **8** | | | | | | 0,08 | 0,08 | 0,11 | 0,12 | 0,14 | 0,15 | 0,17 | 0,19 | 0,19 | 0,21 |
| **9** | | | | | | 1,14 | 1,28 | 0,11 | 0,12 | 0,14 | 0,14 | 0,16 | 0,18 | 0,18 | 0,20 |
| **10** | | | | | | | | 0,08 | 0,11 | 0,12 | 0,13 | 0,15 | 0,17 | 0,17 | 0,19 |
| **11** | | | | | | | | 1,58 | 0,10 | 0,11 | 0,12 | 0,14 | 0,16 | 0,16 | 0,18 |
| **12** | | | | | | | | | 0,08 | 0,08 | 0,12 | 0,13 | 0,15 | 0,15 | 0,16 |
| **13** | | | | | | | | | 1,89 | 2,20 | 0,11 | 0,12 | 0,12 | 0,13 | 0,15 |
| **14** | | | | | | | | | | | 0,08 | 0,10 | 0,10 | 0,13 | 0,14 |
| **15** | | | | | | | | | | | 2,50 | 2,80 | 3,12 | 0,12 | 0,12 |
| **16** | | | | | | | | | | | | | | 0,10 | 0,10 |
| | **Profundidad Total Total Depth** Profondeur Totale: | | | | | | | | | | | | | **3,41** | **3,72** |

# Ref. 8610

## PLAQUITA INTERCAMBIABLE ROSCADO EXTERIOR TN..ER.M
TN..ER.M External Threading Indexable Insert
Plaquette taraudage extérieur TN..ER.M




**Rosca Externa Perfil Total**
Full Profile External Thread
Filetage extérieur profil total

| ISO | P | l mm | d mm | s mm | x mm | w mm | | N° Art. P-620 | € |
|---|---|---|---|---|---|---|---|---|---|
| **TN-16-ER-050-M** | 0,50 | 16 | 9,525 | 3,47 | 0,4 | 0,6 | 10 | 13438 | **20,59** |
| **TN-16-ER-075-M** | 0,75 | 16 | 9,525 | 3,47 | 0,6 | 0,6 | 10 | 13441 | **20,59** |
| **TN-16-ER-100-M** | 1,00 | 16 | 9,525 | 3,47 | 0,7 | 0,7 | 10 | 13444 | **20,59** |
| **TN-16-ER-125-M** | 1,25 | 16 | 9,525 | 3,47 | 0,9 | 0,8 | 10 | 13445 | **20,59** |
| **TN-16-ER-150-M** | 1,50 | 16 | 9,525 | 3,47 | 1,0 | 0,8 | 10 | 13446 | **20,59** |
| **TN-16-ER-175-M** | 1,75 | 16 | 9,525 | 3,47 | 1,2 | 0,9 | 10 | 13447 | **20,59** |
| **TN-16-ER-200-M** | 2,00 | 16 | 9,525 | 3,47 | 1,3 | 1,0 | 10 | 13448 | **20,59** |
| **TN-16-ER-250-M** | 2,50 | 16 | 9,525 | 3,47 | 1,5 | 1,1 | 10 | 13449 | **20,59** |
| **TN-16-ER-300-M** | 3,00 | 16 | 9,525 | 3,47 | 1,5 | 1,2 | 10 | 13450 | **20,59** |
| **TN-22-ER-350-M** | 3,50 | 22 | 12,700 | 4,71 | 2,3 | 1,6 | 10 | 13452 | **34,88** |
| **TN-22-ER-400-M** | 4,00 | 22 | 12,700 | 4,71 | 2,3 | 1,6 | 10 | 13453 | **34,88** |
| **TN-22-ER-450-M** | 4,50 | 22 | 12,700 | 4,71 | 2,4 | 1,7 | 10 | 13454 | **34,88** |
| **TN-22-ER-500-M** | 5,00 | 22 | 12,700 | 4,71 | 2,5 | 1,7 | 10 | 13455 | **34,88** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8610 TN-16-ER-050-M P-620**

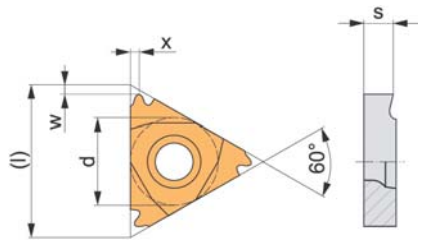
**Porta Plaquitas** / Tool Holder
Porte-Plaquettes: **Pag. 588**

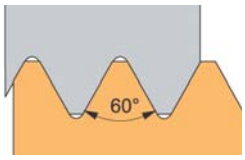
### Set 4 Pcs

| Cont. | | N° Art. | € |
|---|---|---|---|
| **1 plaquita por paso** - 1 insert per Pitch - 1 plaquette par pas<br>**P= 0,5-3 (9pcs)**<br>**+**<br>**1 Porta-Plaquitas** - 1 Tool-Holder - 1 porte-plaquettes<br>**Exterior** - External - Extérieur<br>**Ref. 8820 - Art. 13576 - SER-2525-M16**<br>**+**<br>**1 placa base** - 1 Base Plate - 1 Plaque de Base<br>**Ref. 8815 - Art. 36144**<br>**+**<br>**Destornillador** - Screwdriver - Tournevis - **T-15 (1pc)** | <br> | 32649 | **242,77** |

# Ref. 8615

## PLAQUITA INTERCAMBIABLE ROSCADO EXTERIOR TN..ER.M
TN..ER.M External Threading Indexable Insert
Plaquette taraudage extérieur TN..ER.M




**Rosca Externa Perfil Parcial**
Partial Profile External Thread
Filetage extérieur profil partiel

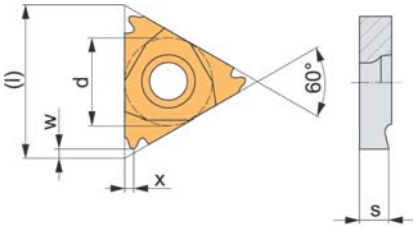
| ISO | P | l mm | d mm | s mm | x mm | w mm | | N° Art. P-620 | € |
|---|---|---|---|---|---|---|---|---|---|
| **TN-16-ER-A60** | 0,50-1,50 | 16 | 9,525 | 3,47 | 0,9 | 0,8 | 10 | 13508 | **20,59** |
| **TN-16-ER-AG60** | 0,50-3,00 | 16 | 9,525 | 3,47 | 1,7 | 1,2 | 10 | 78788 | **20,59** |
| **TN-16-ER-G60** | 1,75-3,00 | 16 | 9,525 | 3,47 | 1,7 | 1,2 | 10 | 13510 | **20,59** |
| **TN-22-ER-N60** | 3,50-5,00 | 22 | 12,700 | 4,71 | 2,5 | 1,7 | 10 | 81506 | **34,88** |

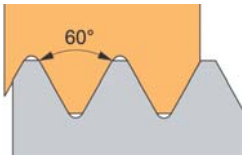
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8615 TN-16-ER-A60 P-620**

**Porta Plaquitas** / Tool Holder
Porte-Plaquettes: **Pag. 588**

# Ref. 8620

## PLAQUITA INTERCAMBIABLE ROSCADO INTERIOR TN..IR.M
TN..IR.M Internal Threading Indexable Insert
Plaquette taraudage intérieur TN..IR.M




**Rosca Interna Perfil Total**
Full Profile Internal Thread
Filetage intérieur profil total

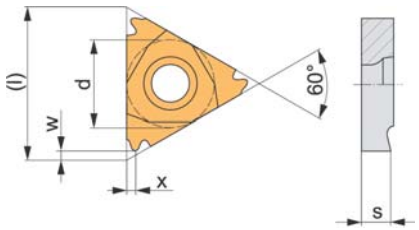
| ISO | P | l mm | d mm | s mm | x mm | w mm | | N° Art. P-620 | € |
|---|---|---|---|---|---|---|---|---|---|
| **TN-11-IR-100-M** | 1,00 | 11 | 6,350 | 3,00 | 0,7 | 0,7 | 10 | 13480 | **20,59** |
| **TN-11-IR-125-M** | 1,25 | 11 | 6,350 | 3,00 | 0,9 | 0,8 | 10 | 13481 | **20,59** |
| **TN-11-IR-150-M** | 1,50 | 11 | 6,350 | 3,00 | 1,0 | 0,8 | 10 | 13484 | **20,59** |
| **TN-16-IR-100-M** | 1,00 | 16 | 9,525 | 3,47 | 0,7 | 0,8 | 10 | 13486 | **20,59** |
| **TN-16-IR-125-M** | 1,25 | 16 | 9,525 | 3,47 | 0,9 | 0,8 | 10 | 13487 | **20,59** |
| **TN-16-IR-150-M** | 1,50 | 16 | 9,525 | 3,47 | 1,0 | 0,8 | 10 | 13492 | **20,59** |
| **TN-16-IR-175-M** | 1,75 | 16 | 9,525 | 3,47 | 1,2 | 0,9 | 10 | 13493 | **20,59** |
| **TN-16-IR-200-M** | 2,00 | 16 | 9,525 | 3,47 | 1,3 | 1,0 | 10 | 13495 | **20,59** |
| **TN-16-IR-250-M** | 2,50 | 16 | 9,525 | 3,47 | 1,5 | 1,1 | 10 | 13496 | **20,59** |
| **TN-16-IR-300-M** | 3,00 | 16 | 9,525 | 3,47 | 1,5 | 1,2 | 10 | 13498 | **20,59** |

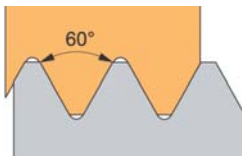
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8620 TN-11-IR-100-M P-620**

**Porta Plaquitas** / Tool Holder
Porte-Plaquettes: **Pag. 588**

# Ref. 8625

## PLAQUITA INTERCAMBIABLE ROSCADO INTERIOR TN..IR.M
TN..IR.M Internal Threading Indexable Insert
Plaquette taraudage intérieur TN..IR.M




**Rosca Interna Perfil Parcial**
Partial Profile Internal Thread
Filetage intérieur profil partiel

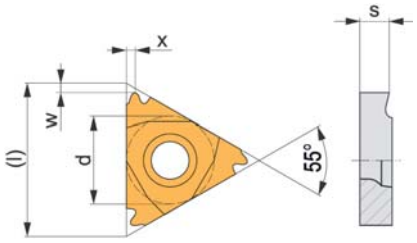
| ISO | P | l mm | d mm | s mm | x mm | w mm | | N° Art. P-620 | € |
|---|---|---|---|---|---|---|---|---|---|
| **TN-11-IR-A60** | 0,50-1,50 | 11 | 6,350 | 3,00 | 0,9 | 0,8 | 10 | 81507 | **20,59** |
| **TN-16-IR-A60** | 0,50-1,50 | 16 | 9,525 | 3,47 | 0,9 | 0,8 | 10 | 13511 | **20,59** |
| **TN-16-IR-AG60** | 0,50-3,00 | 16 | 9,525 | 3,47 | 1,7 | 1,2 | 10 | 78789 | **20,59** |
| **TN-16-IR-G60** | 1,75-3,00 | 16 | 9,525 | 3,47 | 1,7 | 1,2 | 10 | 13513 | **20,59** |

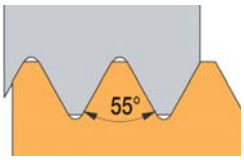
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8625 TN-16-IR-A60 P-620**

**Porta Plaquitas** / Tool Holder
Porte-Plaquettes: **Pag. 588**

# Ref. 8612

## PLAQUITA INTERCAMBIABLE ROSCADO EXTERIOR WHITWORTH 55°
55° Whitworth External Threading Indexable Insert
Plaquette taraudage extérieur Whitworth 55°




**Rosca Interna Perfil Total**
Full Profile Internal Thread
Filetage Intérieur Profil total

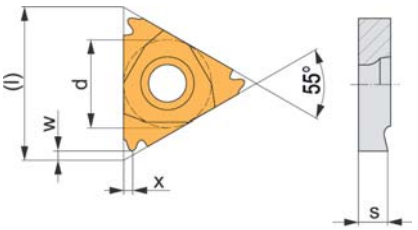
| ISO | P (N° Hilos / Threads / Filets) | l mm | d mm | s mm | x mm | w mm | | N° Art. P-620 | € |
|---|---|---|---|---|---|---|---|---|---|
| **TN-16-ER-080-W** | 8 | 16 | 9,525 | 3,47 | 1,5 | 1,2 | 10 | 59314 | **20,59** |
| **TN-16-ER-100-W** | 10 | 16 | 9,525 | 3,47 | 1,5 | 1,1 | 10 | 59311 | **20,59** |
| **TN-16-ER-110-W** | 11 | 16 | 9,525 | 3,47 | 1,5 | 1,1 | 10 | 59310 | **20,59** |
| **TN-16-ER-120-W** | 12 | 16 | 9,525 | 3,47 | 1,4 | 1,1 | 10 | 59309 | **20,59** |
| **TN-16-ER-140-W** | 14 | 16 | 9,525 | 3,47 | 1,2 | 1,0 | 10 | 59308 | **20,59** |
| **TN-16-ER-160-W** | 16 | 16 | 9,525 | 3,47 | 1,1 | 0,9 | 10 | 59307 | **20,59** |
| **TN-16-ER-180-W** | 18 | 16 | 9,525 | 3,47 | 1,0 | 0,8 | 10 | 59306 | **20,59** |
| **TN-16-ER-200-W** | 20 | 16 | 9,525 | 3,47 | 0,9 | 0,8 | 10 | 59305 | **20,59** |

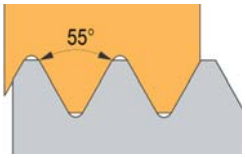
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8612 TN-16-ER-100-W P-620**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 588**

# Ref. 8622

## PLAQUITA INTERCAMBIABLE ROSCADO INTERIOR WHITWORTH 55°
55° Whitworth Internal Threading Indexable Insert
Plaquette taraudage intérieur Whitworth 55°




**Rosca Interna Perfil Total**
Full Profile Internal Thread
Filetage Intérieur Profil total

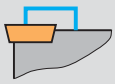
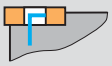
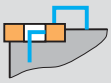
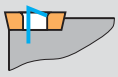
| ISO | P (N° Hilos / Threads / Filets) | l mm | d mm | s mm | x mm | w mm | | N° Art. P-620 | € |
|---|---|---|---|---|---|---|---|---|---|
| **TN-16-IR-080-W** | 8 | 16 | 9,525 | 3,47 | 1,5 | 1,2 | 10 | 59321 | **20,59** |
| **TN-16-IR-100-W** | 10 | 16 | 9,525 | 3,47 | 1,5 | 1,1 | 10 | 59320 | **20,59** |
| **TN-16-IR-110-W** | 11 | 16 | 9,525 | 3,47 | 1,5 | 1,1 | 10 | 60000 | **20,59** |
| **TN-16-IR-120-W** | 12 | 16 | 9,525 | 3,47 | 1,4 | 1,1 | 10 | 59319 | **20,59** |
| **TN-16-IR-140-W** | 14 | 16 | 9,525 | 3,47 | 1,2 | 1,0 | 10 | 59318 | **20,59** |
| **TN-16-IR-160-W** | 16 | 16 | 9,525 | 3,47 | 1,1 | 0,9 | 10 | 59317 | **20,59** |
| **TN-16-IR-180-W** | 18 | 16 | 9,525 | 3,47 | 1,0 | 0,8 | 10 | 59316 | **20,59** |
| **TN-16-IR-200-W** | 20 | 16 | 9,525 | 3,47 | 0,9 | 0,8 | 10 | 59315 | **20,59** |

**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8622 TN-16-IR-100-W P-620**

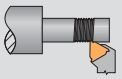
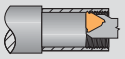
**Porta Plaquitas** / Tool Holder
Porte-Plaquettes: **Pag. 588**

# CÓDIGOS ISO ELECCIÓN PORTA-PLAQUITAS ROSCADO
Threading Tool-Holder Choice ISO Codes
Codes ISO choix Porte-Plaquettes taraudage

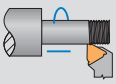
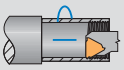
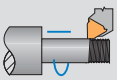
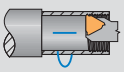
## 1
Sistema Anclaje
Clamping system
Type attachement

| | |
|---|---|
| C |  |
| P |  |
| M |  |
| S |  |

## 2
Tipo Mecanizado
Way of machining
Type usinage

| | | |
|---|---|---|
| E | Exterior<br>External<br>Extérieur |  |
| I | Interior<br>Internal<br>Intérieur |  |

## 3
Dirección Corte
Direction of cut
Direction coupe

| | | |
|---|---|---|
| R - Dcha./Right/Droit | Interior<br>Internal<br>Intérieur |  |
| | Exterior<br>External<br>Extérieur |  |
| L - Izda./Left/Gauche | Interior<br>Internal<br>Intérieur |  |
| | Exterior<br>External<br>Extérieur |  |

## 4
Tipo de Fabricación
Type of Fabrication
Type fabrication

| | |
|---|---|
| - | **normal** / normal / normal |
| S | **especial** / special / spécial |

| 1 | 2 | 3 | | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| S | E | R | - | - | 2525 | M | 16 |

## 5
Dimensiones (mm)
Dimensions (mm)
Dimensions (mm)

| | | |
|---|---|---|
| Torneado exterior<br>External turning<br>Tournage extérieur | 2525 | 25 x 25 mm |
| Torneado interior<br>Internal turning<br>Tournage intérieur | 1416 | mango / shank /queue 14 mm<br>ancho mango / shank width<br>largeur queue 16 mm |

## 6
Largo total
Total length
Longueur total

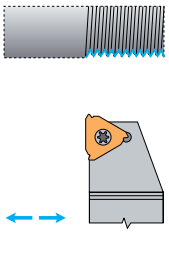
| | $l_1$ [mm] |
|---|---|
| H | 100 |
| J | 110 |
| K | 125 |
| L | 140 |
| M | 150 |
| N | 160 |
| P | 170 |
| Q | 180 |
| R | 200 |
| S | 250 |
| T | 300 |
| U | 350 |
| V | 400 |
| W | 450 |
| X | Spec. |
| Y | 500 |

## 7
Dimensiones (mm)
Dimensions (mm)
Dimensions (mm)

| d [mm] | T |
|---|---|
| 6,350 | 11 |
| 9,525 | 16 |
| 12,700 | 22 |

# Ref. 8820

## PORTA-PLAQUITAS ROSCADO EXTERIOR SER
SER External Threading Tool-Holder
Porte-Plaquettes taraudage extérieur SER




**Nota: Grado Inclinación Standard Porta-Plaquitas λ = 1,5°**
Note: Holder Standard Inclination Angle λ = 1,5°
Note: Degré inclinaison standard Porte-Plaquettes λ = 1,5°

| ISO | N° Art. | | h=H mm | b mm | l mm | λ° | € | Ref. 8803 | | Ref. 8803 | | Ref. 8803 | | Ref. 8801 | | Ref. 8815 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SER-1616-H16** | 83024 | TN-16-ER | 16 | 16 | 100 | 1,5 | **160,93** | **Z-12** Art. 13848 **8,42 €** | 5 | - | | **ZSY3** Art. 74798 **4,10 €** | 5 | **ZT-15** Art. 10512 **11,06€** | 1 | Art. 36144 **20,99 €** | 5 |
| **SER-2020-K16** | 13573 | | 20 | 20 | 125 | 1,5 | **208,35** | | | | | | | | | | |
| **SER-2525-M16** | 13576 | | 25 | 25 | 150 | 1,5 | **213,97** | | | | | | | | | | |
| **SER-3232-P22** | 13577 | TN-22-ER | 32 | 32 | 170 | 1,5 | **246,72** | **Z-13** Art. 13843 **9,67 €** | 5 | **ZSP-405** Art. 13844 **6,05 €** | 5 | - | | **ZT-20** Art. 13845 **11,06 €** | 1 | Art. 32581 **35,09 €** | 5 |

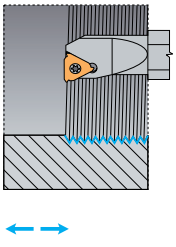
**Plaquita** / Insert / Plaquette: **Pag. 574, 584**

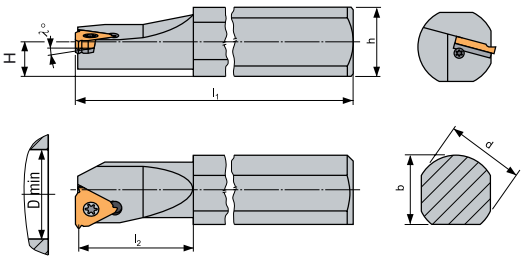
| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |

| | |
|---|---|
| | **Destornillador** - Screwdriver - Tournevis |
| | **Placa Base** - Base Plate - Plaque de base |

# Ref. 8830

## PORTA-PLAQUITAS ROSCADO INTERIOR SIR
SIR Internal Threading Tool-Holder
Porte-Plaquettes taraudage intérieur SIR






| ISO | N° Art. | | d mm | $l_1$ mm | $l_2$ mm | H mm | D min. | h mm | b mm | € | Ref. 8803 | | Ref. 8803 | | Ref. 8801 | | Ref. 8815 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SIR-0910-K11** | 13579 | TN-11-IR | 10 | 125 | 16 | 4,5 | 13 | 9 | 14,5 | **217,09** | **T07** Art. 10846 **3,20 €** | 5 | - | | **ZT-08** Art. 10506 **11,06 €** | 1 | - | |
| **SIR-1516-M16** | 13582 | TN-16-IR | 16 | 150 | 25 | 7,5 | 22 | 15 | 14,0 | **237,77** | **Z-09** Art. 13847 **8,42 €** | 5 | | | **ZT-15** Art. 10512 **11,06 €** | 1 | | |
| **SIR-2325-R16** | 13583 | | 25 | 200 | 35 | 11,5 | 29 | 23,0 | 23,5 | **295,89** | **Z-12** Art. 13848 **8,42 €** | 5 | **ZSY3** Art. 74798 **4,10 €** | 5 | | | **ZYI3** Art. 22701 **20,99 €** | 5 |

**Plaquita** / Insert / Plaquette: **Pag. 575, 585**

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |

| | |
|---|---|
| | **Destornillador** - Screwdriver - Tournevis |
| | **Placa Base** - Base Plate - Plaque de base |

TORNEADO - Turning - Tournage

# Set 8799

## SETS DE TORNEADO
Turning Inserts Sets
Jeux de tournage

### Set 1

### 5 Pcs

| Cont. | | N° Art. | € |
|---|---|---|---|
| **Plaquita** - Insert - Plaquette<br>**Ref. 8560 - Art. 26323**<br>**TCMT-16T308-E-ZRR C-525 (20pcs)**<br>+<br>**Porta-Plaquita** - Tool-Holder - Porte-Plaquettes<br>**Exterior** - External - Extérieur<br>**Ref. 8703 - Art.18660**<br>**STJCR-2020K16 (1pc)**<br>**Interior** - Internal - Intérieur<br>**Ref. 8718 - Art. 18789**<br>**S25T-STFCR-16 (1pc)**<br>+<br>**Destornillador** - Screwdriver - Tournevis<br>**T-15 (1pc)** | | 83386 | Set Price!<br>**379,28** |

### Set 2

### 7 Pcs

| Cont. | | N° Art. | € |
|---|---|---|---|
| **Plaquita Torneado**- Turning Insert - Plaquette tournage<br>**Ref. 8500 - Art. 26281 (10 pcs)**<br>**CCMT 09T308-E-ZRR**<br>**Ref. 8500 - Art. 59270 (10 pcs)**<br>**CCMT 060204-E-ZMM**<br>+<br>**Porta-Plaquita** - Tool-Holder - Porte-Plaquettes<br>**Exterior** - External - Extérieur<br>**Ref. 8704 - Art. 42945 (1 pc)**<br>**SCLR 2020 K09**<br>**Interior** - Internal - Intérieur<br>**Ref. 8751 - Art. 19443 (1 pc)**<br>**S20S-SCLR 09**<br>**Ref. 8751 - Art. 19435 (1 pc)**<br>**S10M-SCLR 06**<br>+<br>**Destornillador** - Screwdriver - Tournevis<br>**T-15 (1pc) - T-07 (1pc)** | | 20098 | Set Price!<br>**460,20** |

### Set 3

### 7 Pcs

| Cont. | | N° Art. | € |
|---|---|---|---|
| **Plaquita Torneado** - Turning Insert - Plaquette tournage<br>**Ref. 8500 - Art. 26281 (10 pcs)**<br>**CCMT 09T308-E-ZRR**<br>**Plaquita Tronzado**- Parting Insert - Plaquette tronçonnage<br>**Ref. 8601 MGMN - Art. 12712 (10 pcs)**<br>**3.00-0.40-GC-ZF**<br>+<br>**Porta-Plaquita** - Tool-Holder - Porte-Plaquettes<br>**Exterior** - External - Extérieur<br>**Ref. 8704 - Art. 42945 (1 pc)**<br>**SCLCR 2020 K09**<br>**Interior** - Internal - Intérieur<br>**Ref. 8751 - Art. 19443 (1 pc)**<br>**S20S-SCLCR 09**<br>**Porta-plaquita Tronzado**<br>Parting Tool-Holder - Porte-Plaquettes tronçonnage<br>**Ref. 8865 - Art. 12729 (1 pc)**<br>**XMCGR-2020-K-3.00**<br>+<br>**Destornillador** - Screwdriver - Tournevis **T-15 (1pc)**<br>+<br>**Allen 4 (1pc)** | | 20099 | Set Price!<br>**533,55** |

# Mejora continua del control de calidad

izartool.com

# FRESADO
Milling
Fraisage

## CLASIFICACIÓN CALIDADES - ELECCIÓN PRINCIPAL FRESADO
Milling Grade Classification - Main Choice
Classement des Qualités - Choix principal fraisage

| Grupo ISO<br>ISO Group<br>Groupe ISO | | Fresado - Milling - Fraisage | | | Taladrado/Roscado/Tronzado<br>Drilling/Threading/Parting<br>Perçage/Taraudage/Tronçonnage | |
|---|---|---|---|---|---|---|
| | | Calidades con Recubrimiento<br>Coated Grades - Qualités avec revêtement | | Sin Recubrimiento<br>Unc. - Sans rev. | Calidades con Recubrimiento<br>Coated - Avec revêtement | |
| | | Metal Duro - Carbide - Carbure | | MD/HM<br>Carbure | Metal Duro - Carbide - Carbure | |
| | | CVD | PVD | | CVD | PVD |
| Resistencia al desgaste<br>Wear resistance<br>Résistance à l'usure<br>**P**<br>Tenacidad<br>Toughness<br>Ténacité | P01 | | | | | |
| | P05 | | P-605 | | | |
| | P10 | | P-610 | | | |
| | P15 | | P-615 | | | |
| | P20 | | | | | |
| | P25 | C-526 | | | | P-620 |
| | P30 | | P-620 | | C-540 | |
| | P35 | | P-630 | | | P-625 |
| | P40 | | P-640 | | | |
| | P45 | | | | | |
| | P50 | | | | | |
| Resistencia al desgaste<br>Wear resistance<br>Résistance à l'usure<br>**M**<br>Tenacidad<br>Toughness<br>Ténacité | M01 | | | | | |
| | M05 | | | | | |
| | M10 | | P-610 | | | |
| | M15 | | P-615 | P-010 | | P-620 |
| | M20 | C-526 | | | | |
| | M25 | | P-625 | | | P-625 |
| | M30 | | P-630 | | C-540 | |
| | M35 | | P-640 | | | |
| | M40 | | | | | |
| Resistencia al desgaste<br>Wear resistance<br>Résistance à l'usure<br>**K**<br>Tenacidad<br>Toughness<br>Ténacité | K01 | | | | | |
| | K05 | | | | | |
| | K10 | | | | | |
| | K15 | | P-610 | | | |
| | K20 | | P-615 | P-010 | | |
| | K25 | C-526 | | | | |
| | K30 | | P-620 | | | P-625 |
| | K35 | | P-630 | | C-540 | |
| | K40 | | P-640 | | | |
| Resistencia al desgaste<br>Wear resistance<br>Résistance à l'usure<br>**S**<br>Tenacidad<br>Toughness<br>Ténacité | S01 | | | | | |
| | S05 | | | | | |
| | S10 | | P-610 | | | |
| | S15 | | P-615 | P-010 | | P-620 |
| | S20 | | | | | P-625 |
| | S25 | | P-630 | | C-540 | |
| | S30 | | P-640 | | | |
| Resistencia al desgaste<br>Wear resistance<br>Résistance à l'usure<br>**N**<br>Tenacidad<br>Toughness<br>Ténacité | N01 | | | | | |
| | N05 | | | | | |
| | N10 | | | | | |
| | N15 | | P-610 | | | |
| | N20 | | P-615 | P-010 | | |
| | N25 | | P-630 | | | P-625 |
| | N30 | | | | | |
| Resistencia al desgaste<br>Wear resistance<br>Résistance à l'usure<br>**H**<br>Tenacidad<br>Toughness<br>Ténacité | H01 | | | | | |
| | H05 | | P-605 | | | |
| | H10 | | P-610 | | | |
| | H15 | C-526 | P-615 | P-010 | | |
| | H20 | | P-630 | | | P-625 |
| | H25 | | | | | |
| | H30 | | | | | |

# ELECCIÓN CONDICIONES CORTE SEGUN CALIDADES FRESADO
Milling Cutting Condition Choice depending on Qualities
Choix de conditions de coupe à cause de qualités fraisage

## P

| Porta-Plaquitas Tool-Holder Porte-Plaquettes | Plaquitas Inserts Plaquettes | Condiciones Corte Cutting Conditions Conditions coupe | Calidades Qualities Qualités C-526 | P-610 | P-615 | P-625 | P-630 | P-640 | P-010 |
|---|---|---|---|---|---|---|---|---|---|
| S90XN08<br>S90AP-10<br>S90AP-16<br>S90XO-06<br>SAP-16D | XNMX<br>APKT<br>XOET<br>APET | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | 315<br>300<br>280 | | | 230<br>220<br>180 | 180<br>170<br>150 | 160<br>150<br>130 | |
| S-45-SN-12<br>50060 | SEHT<br>WNMW | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | 315<br>300<br>280 | 250<br>230<br>180 | | 230<br>220<br>180 | | 160<br>150<br>130 | |
| S-45OD06-45<br>W45SE-12 | ODMT<br>SEKR<br>SEKN | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | 315<br>300<br>280 | 250<br>210<br>200 | | 230<br>220<br>180 | | 160<br>150<br>130 | |
| W90TP-22 | TPKN<br>TPKR | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | 315<br>300<br>280 | | | 230<br>220<br>180 | | 160<br>150<br>130 | |
| S90... | SNHQ | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | | | | | | 280<br>270<br>260 | |
| S-45OD06-45<br>W45SE-12 | RDHT<br>RDHW | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | | 250<br>210<br>200 | | 230<br>220<br>180 | | 160<br>150<br>130 | |
| SRC<br>SLC | RC<br>LC | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | | | 310<br>295<br>280 | | 270<br>240<br>200 | | |

**Factor K- Corrige Vc en función de**
**K Factor- Correct Vc depending on**
Facteur K- Vc correct à cause de

| | |
|---|---|
| **Forjados/fundidos carcasa**<br>**Forging/melting w. frame**<br>Forgeage/fondu carcasse | K = 0,70-0,90 |
| **Maq. en buen estado**<br>**Good condition mach.**<br>Mach. en bon état | K = 1,05-1,20 |
| **Maq. en mal estado**<br>**Bad condition mach.**<br>Mach. en mauvais état | K = 0,80-0,95 |

**Vida plaquita**
**Insert life**
Vie plaquette

| | |
|---|---|
| $T_{min}$ 15 | K = 1,23 |
| $T_{min}$ 20 | K = 1,13 |
| $T_{min}$ 30 | K = 1,00 |
| $T_{min}$ 45 | K = 0,89 |
| $T_{min}$ 60 | K = 0,81 |
| $T_{min}$ 90 | K = 0,72 |

## M

| Porta-Plaquitas Tool-Holder Porte-Plaquettes | Plaquitas Inserts Plaquettes | Condiciones Corte Cutting Conditions Conditions coupe | Calidades Qualities Qualités C-526 | P-610 | P-615 | P-625 | P-630 | P-640 | P-010 |
|---|---|---|---|---|---|---|---|---|---|
| S90XN08<br>S90AP-10<br>S90AP-16<br>S90XO-06<br>SAP-16D | XNMX<br>APKT<br>XOET<br>APET | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | 185<br>180<br>165 | | | 170<br>165<br>155 | | 150<br>145<br>140 | |
| S-45-SN-12<br>50060 | SEHT<br>WNMW | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | 185<br>180<br>165 | | | 160<br>150<br>110 | | 120<br>110<br>100 | |
| S-45OD06-45<br>W45SE-12 | ODMT<br>SEKR<br>SEKN | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | 185<br>180<br>165 | 160<br>150<br>110 | | | | 120<br>110<br>100 | |
| W90TP-22 | TPKN<br>TPKR | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | | | | 160<br>150<br>110 | | 120<br>110<br>100 | |
| S90... | SNHQ | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | | | | | | 165<br>160<br>155 | |
| S-45OD06-45<br>W45SE-12 | RDHT<br>RDHW | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | | | | 160<br>150<br>110 | | 120<br>110<br>100 | |
| SRC<br>SLC | RC<br>LC | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | | | 185<br>175<br>165 | | 155<br>150<br>140 | | |

**Factor K- Corrige Vc en función de**
**K Factor- Correct Vc depending on**
Facteur K- Vc correct à cause de

| | |
|---|---|
| **Forjados/fundidos carcasa**<br>**Forging/melting w. frame**<br>Forgeage/fondu carcasse | K = 0,70-0,90 |
| **Maq. en buen estado**<br>**Good condition mach.**<br>Mach. en bon état | K = 1,05-1,20 |
| **Maq. en mal estado**<br>**Bad condition mach.**<br>Mach. en mauvais état | K = 0,80-0,95 |

**Vida plaquita**
**Insert life**
Vie plaquette

| | |
|---|---|
| $T_{min}$ 15 | K = 1,23 |
| $T_{min}$ 20 | K = 1,13 |
| $T_{min}$ 30 | K = 1,00 |
| $T_{min}$ 45 | K = 0,89 |
| $T_{min}$ 60 | K = 0,81 |
| $T_{min}$ 90 | K = 0,72 |

## K

| Porta-Plaquitas Tool-Holder Porte-Plaquettes | Plaquitas Inserts Plaquettes | Condiciones Corte Cutting Conditions Conditions coupe | Calidades Qualities Qualités C-526 | P-610 | P-615 | P-625 | P-630 | P-640 | P-010 |
|---|---|---|---|---|---|---|---|---|---|
| S90XN08<br>S90AP-10<br>S90AP-16<br>S90XO-06<br>SAP-16D | XNMX<br>APKT<br>XOET<br>APET | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | 480<br>440<br>395 | | | 280<br>230<br>190 | 230<br>225<br>180 | 250<br>220<br>170 | |
| S-45-SN-12<br>50060 | SEHT<br>WNMW | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | 450<br>415<br>380 | 300<br>250<br>190 | | 280<br>230<br>190 | | 250<br>220<br>170 | |
| S-45OD06-45<br>W45SE-12 | ODMT<br>SEKR<br>SEKN | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | 450<br>415<br>370 | 300<br>250<br>210 | | 280<br>230<br>190 | | 250<br>220<br>170 | |
| W90TP-22 | TPKN<br>TPKR | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | | | | | | | |
| S90... | SNHQ | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | | | | | | 255<br>245 | |
| S-45OD06-45<br>W45SE-12 | RDHT<br>RDHW | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | | 300<br>250<br>210 | | 280<br>230<br>190 | | 250<br>220<br>170 | |
| SRC<br>SLC | RC<br>LC | **Acabado - Finishing** - Finition<br>**Semidesbaste - Semiroughing** - Semiébauche<br>**Desbaste - Roughing** - Ébauche | | | 290<br>280<br>265 | | 250<br>235<br>220 | | |

**Factor K- Corrige Vc en función de**
**K Factor- Correct Vc depending on**
Facteur K- Vc correct à cause de

| | |
|---|---|
| **Forjados/fundidos carcasa**<br>**Forging/melting w. frame**<br>Forgeage/fondu carcasse | K = 0,70-0,90 |
| **Maq. en buen estado**<br>**Good condition mach.**<br>Mach. en bon état | K = 1,05-1,20 |
| **Maq. en mal estado**<br>**Bad condition mach.**<br>Mach. en mauvais état | K = 0,80-0,95 |

**Vida plaquita**
**Insert life**
Vie plaquette

| | |
|---|---|
| $T_{min}$ 15 | K = 1,23 |
| $T_{min}$ 20 | K = 1,13 |
| $T_{min}$ 30 | K = 1,00 |
| $T_{min}$ 45 | K = 0,89 |
| $T_{min}$ 60 | K = 0,81 |
| $T_{min}$ 90 | K = 0,72 |

# ELECCIÓN CONDICIONES CORTE SEGUN CALIDADES FRESADO
Milling Cutting Condition Choice depending on Qualities
Choix de conditions de coupe à cause de qualités fraisage

## S

| Porta-Plaquitas Tool-Holder Porte-Plaquettes | Plaquitas Inserts Plaquettes | Condiciones Corte Cutting Conditions Conditions coupe | Calidades Qualities Qualités C-526 | P-610 | P-615 | P-625 | P-630 | P-640 | P-010 |
|---|---|---|---|---|---|---|---|---|---|
| S90XN08 S90AP-10 S90AP-16 S90XO-06 SAP-16D | XNMX APKT XOET APET | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | 50 | | | 45<br>40 | 75<br>70 | |
| S-45-SN-12 50060 | SEHT WNMW | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | | 90<br>50<br>20 | | 80<br>40<br>20 | |
| S-45OD06-45 W45SE-12 | ODMT SEKR SEKN | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | 50 | | 90<br>85 | | 80<br>75 | |
| W90TP-22 | TPKN TPKR | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | | | | | |
| S90... | SNHQ | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | | | | 80<br>80 | |
| S-45OD06-45 W45SE-12 | RDHT RDHW | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | | | 90<br>50<br>20 | 80<br>40<br>20 | |
| SRC SLC | RC LC | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | 90<br>85 | | 50 | | |

Factor K- Corrige Vc en función de K Factor- Correct Vc depending on Facteur K- Vc correct à cause de

| | |
|---|---|
| Forjados/fundidos carcasa Forging/melting w. frame Forgeage/fondu carcasse | K = 0,70-0,90 |
| Maq. en buen estado Good condition mach. Mach. en bon état | K = 1,05-1,20 |
| Maq. en mal estado Bad condition mach. Mach. en mauvais état | K = 0,80-0,95 |

Vida plaquita Insert life Vie plaquette

| | |
|---|---|
| $T_{min}$ 15 | K = 1,23 |
| $T_{min}$ 20 | K = 1,13 |
| $T_{min}$ 30 | K = 1,00 |
| $T_{min}$ 45 | K = 0,89 |
| $T_{min}$ 60 | K = 0,81 |
| $T_{min}$ 90 | K = 0,72 |

## N

| Porta-Plaquitas Tool-Holder Porte-Plaquettes | Plaquitas Inserts Plaquettes | Condiciones Corte Cutting Conditions Conditions coupe | Calidades Qualities Qualités C-526 | P-610 | P-615 | P-625 | P-630 | P-640 | P-010 |
|---|---|---|---|---|---|---|---|---|---|
| S90XN08 S90AP-10 S90AP-16 S90XO-06 SAP-16D | XNMX APKT XOET APET | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | | | | | 900<br>400<br>350 |
| S-45-SN-12 50060 | SEHT WNMW | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | | | | | 900<br>400<br>350 |
| S-45OD06-45 W45SE-12 | ODMT SEKR SEKN | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | | | | | |
| W90TP-22 | TPKN TPKR | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | | | | | |
| S90... | SNHQ | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | | | | | |
| S-45OD06-45 W45SE-12 | RDHT RDHW | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | | | | | |
| SRC SLC | RC LC | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | 775<br>735<br>700 | | 660<br>625<br>580 | | |

Factor K- Corrige Vc en función de K Factor- Correct Vc depending on Facteur K- Vc correct à cause de

| | |
|---|---|
| Forjados/fundidos carcasa Forging/melting w. frame Forgeage/fondu carcasse | K = 0,70-0,90 |
| Maq. en buen estado Good condition mach. Mach. en bon état | K = 1,05-1,20 |
| Maq. en mal estado Bad condition mach. Mach. en mauvais état | K = 0,80-0,95 |

Vida plaquita Insert life Vie plaquette

| | |
|---|---|
| $T_{min}$ 15 | K = 1,23 |
| $T_{min}$ 20 | K = 1,13 |
| $T_{min}$ 30 | K = 1,00 |
| $T_{min}$ 45 | K = 0,89 |
| $T_{min}$ 60 | K = 0,81 |
| $T_{min}$ 90 | K = 0,72 |

## H

| Porta-Plaquitas Tool-Holder Porte Plaquettes | Plaquitas Inserts Plaquettes | Condiciones Corte Cutting Conditions Conditions coupe | Calidades Qualities Qualités C-526 | P-610 | P-615 | P-625 | P-630 | P-640 | P-010 |
|---|---|---|---|---|---|---|---|---|---|
| S90XN08 S90AP-10 S90AP-16 S90XO-06 SAP-16D | XNMX APKT XOET APET | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | 40<br>35 | | | 55<br>55 | | |
| S-45-SN-12 50060 | SEHT WNMW | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | 55<br>50 | | 40<br>35 | | | | |
| S-45OD06-45 W45SE-12 | ODMT SEKR SEKN | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | 55<br>50 | 45<br>35 | | 60<br>55 | | | |
| W90TP-22 | TPKN TPKR | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | | | | | |
| S90... | SNHQ | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | | | | | |
| S-45OD06-45 W45SE-12 | RDHT RDHW | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | | | | | | |
| SRC SLC | RC LC | Acabado - Finishing - Finition<br>Semidesbaste - Semiroughing - Semiébauche<br>Desbaste - Roughing - Ébauche | | 55<br>50 | | | | | |

Factor K- Corrige Vc en función de K Factor- Correct Vc depending on Facteur K- Vc correct à cause de

| | |
|---|---|
| Forjados/fundidos carcasa Forging/melting w. frame Forgeage/fondu carcasse | K = 0,70-0,90 |
| Maq. en buen estado Good condition mach. Mach. en bon état | K = 1,05-1,20 |
| Maq. en mal estado Bad condition mach. Mach. en mauvais état | K = 0,80-0,95 |

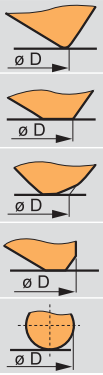
Vida plaquita Insert life Vie plaquette

| | |
|---|---|
| $T_{min}$ 15 | K = 1,23 |
| $T_{min}$ 20 | K = 1,13 |
| $T_{min}$ 30 | K = 1,00 |
| $T_{min}$ 45 | K = 0,89 |
| $T_{min}$ 60 | K = 0,81 |
| $T_{min}$ 90 | K = 0,72 |

# CÓDIGOS ISO ELECCIÓN PORTA-PLAQUITAS PLATO FRESADO
Milling SHELL Tool-Holder Choice ISO Codes
Codes ISO choix Porte-Plaquettes PLATEAU fraisage

## ISO 7406-88 DIN 8029/1

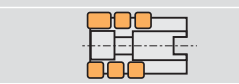
### 1
Diámetro filo corte
Cutter diameter
Diamétre filet coupe




### 2
Tipo de corte, designación y/o tamaño anclaje
Cutter type, designation and/or size of clamping
Type coupe, nom et/oú taille fixation

| | | | |
|---|---|---|---|
| A | ISO 6462/A DIN 8030/A CSN 22 2301/A | B | ISO 6462/B DIN 8030/B CSN 22 2301/B |
| C | ISO 6462/C DIN 8030/C CSN 22 2301/C | | |

| | |
|---|---|
| F | ød =27° |
| G | ød =32° |
| H | ød =40° |
| J | ød =50° |
| K | ød =60° |
| M | ød =80° |
| T | |



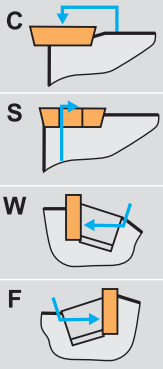




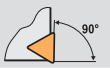
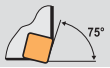

### 3
Nº filos trabajando
Nº of working edges
Numéro filets qui travaillent

### 4
Dirección corte
Direction of cut
Direction coupe

### 5
Designación anclaje
Clamping desgnation
Type fixation

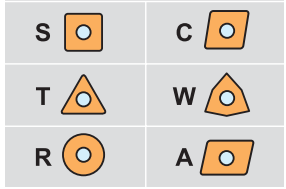



### 6
Angulo entrada
Setting angle
Angle entrée

| | |
|---|---|
| K 90° |  |
| K 75° |  |
| K 60° | |
| K 45° | |
| K MO | |



### 7
Forma plaquita
Insert shape
Forme plaquette



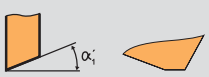

### 8
Angulo incidencia
Clearance angle
Angle incidence

| | | | |
|---|---|---|---|
| N | $\alpha_1$ = 0° | D | $\alpha_1$ = 15° |
| C | $\alpha_1$ = 7° | E | $\alpha_1$ = 20° |
| P | $\alpha_1$ = 11° | F | $\alpha_1$ = 25° |

### 9
Tamaño plaquita o longitud filo corte
Insert size or cutting edge length
Taille plaquette oú longueur filet coupe

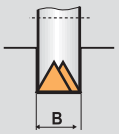
| d [mm] | S | C | T | W | R | A |
|---|---|---|---|---|---|---|
| 6,35 | | | | | | 09/11 |
| 7,94 | | | | 05 | | |
| 8,00 | | | | | 08 | |
| 9,525 | 09 | 09 | 16 | 06 | | 12 |
| 10,00 | | | | | 10 | |
| 12,00 | | | | | 12 | |
| 12,70 | 12 | 12 | 22 | 08 | | 15 |
| 15,875 | 15 | | | | | |
| 16,00 | | | | | 16 | |
| 25,00 | | | | | 25 | |
| 25,40 | 25 | | | | | |

### 10
Angulo incidencia
Clearance angle
Angle incidence

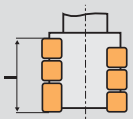



| | | | |
|---|---|---|---|
| N | $\alpha_1$ = 0° | E | $\alpha_1$ = 20° |
| P | $\alpha_1$ = 11° | F | $\alpha_1$ = 25° |
| D | $\alpha_1$ = 15° | | |

### 11
Longitud (ancho) filo corte
Cutting edge length (width)
Longueur arête de coupe




B [mm]



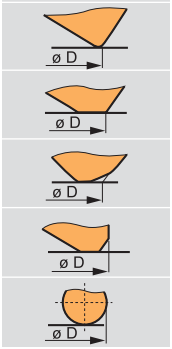
l [mm]

| 1 | 2 | 3 | 4 | | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 160 | H | 05 | N | | F | 90 | T | P | 16 | P | 22 |
| 250 | C | 16 | R | – | W | 45 | S | E | 12 | F | |

# CÓDIGOS ISO ELECCIÓN PORTA-PLAQUITAS MANGO FRESADO
Milling END Tool-Holder Choice ISO Codes
Codes ISO choix Porte-Plaquettes QUEUE fraisage

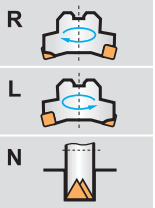
## ISO 7548-86 DIN 8029/2

### 1
Diámetro filo corte
Cutter diameter
Diamètre filet coupe

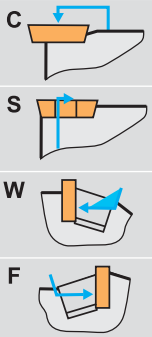



### 3
Nº filos trabajando
Nº of working edges
Numéro filets qui travaillent

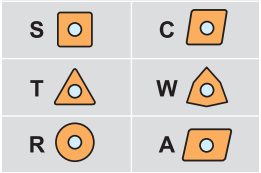
### 4
Dirección corte
Direction of cut
Direction coupe




### 5
Designación anclaje
Clamping designation
Type fixation




### 7
Forma Plaquita
Insert Shape
Forme plaquette



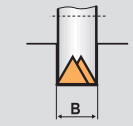

### 8
Angulo Incidencia
Clearance Angle
Angle d'incidence

| | | | |
|---|---|---|---|
| N | $\alpha_1$ = 0° | D | $\alpha_1$ = 15° |
| C | $\alpha_1$ = 7° | E | $\alpha_1$ = 20° |
| P | $\alpha_1$ = 11° | F | $\alpha_1$ = 25° |

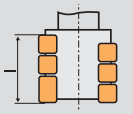
### 9
Tamaño plaquita o longitud filo corte
Insert size or cutting edge length
Taille plaquette oú longueur filet coupe

| d [mm] | S | C | T | W | R | A |
|---|---|---|---|---|---|---|
| 6,35 | | | | | | 09/11 |
| 7,94 | | | | 05 | | |
| 8,00 | | | | | 08 | |
| 9,525 | 09 | 09 | 16 | 06 | | 12 |
| 10,00 | | | | | 10 | |
| 12,00 | | | | | 12 | |
| 12,70 | 12 | 12 | 22 | 08 | | 15 |
| 15,875 | 15 | | | | | |
| 16,00 | | | | | 16 | |
| 25,00 | | | | | 25 | |
| 25,40 | 25 | | | | | |

### 11
Longitud (ancho) filo corte
Cutting edge length (width)
Longueur arête de coupe



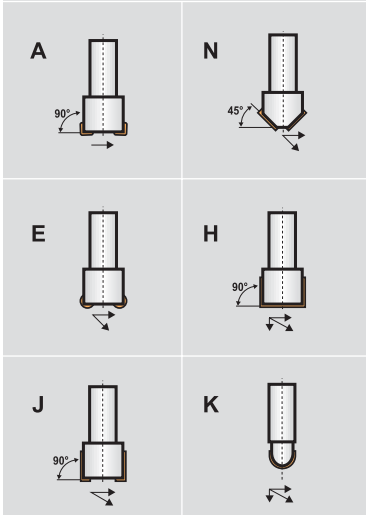

B [mm]



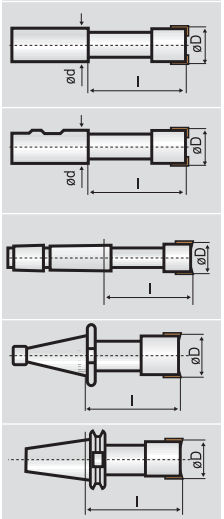
l [mm]

| 1 | 1a | 3 | 4 | 2a | 3a | 4a | | 5 | 7 | 8 | 9(11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 63 | J | 4 | R | 150 | H | 50 | – | S | SA | P | 95 |
| 32 | A | 3 | R | 040 | B | 32 | | S | A | D | 12 |

### 1a
Tipo de corte y ángulo de entrada
Cutter type & setting angle
Type coupe et angle d'entrée




### 2a
Tipo de corte y ángulo de entrada
Cutter type & setting angle
Type coupe et angle d'entrée




### 3a
Designación mango
Shank designation
Type fixation

| | |
|---|---|
| A | DIN 1835/1-A |
| B | ISO 3338/B<br>DIN 1835/1-B<br>CSN 22 0412 |
| E | ISO 296<br>DIN 228/A<br>CSN 22 0420 |
| G | ISO 297<br>DIN 2080/1<br>CSN 22 0430 |
| X | CSN 22 0432 |
| H | ISO 7388/1<br>DIN 69871/A<br>CSN 22 0434 |

### 4a
Tamaño mango
Shank size
Type queue

| ø D | ø d |
|---|---|
| 08 + 32 | 10 + 32 |

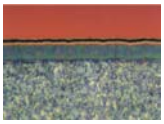
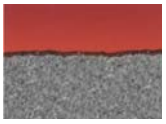
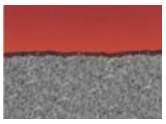
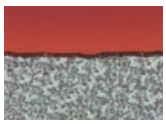
| ø D | ø d |
|---|---|
| 10; 12; 16 | 16 |
| 20 | 20 |
| 25 | 25 |
| 32; 40 | 32 |

| ø D | MORSE No. |
|---|---|
| 10; 12; 16 | 02 |
| 20; 25; 32 | 03 |
| 40 | 04 |

| ø D | 7:24 No. |
|---|---|
| 32; 40 | 40 |
| (50; 63) | |
| 50; 63; 80 | 50 |

| ø D | 7:24 No. |
|---|---|
| 32; 40 | 40 |
| 50; 63; 80 | 50 |

# GRADOS RECUBRIMIENTO MÉTODOS CVD-PVD FRESADO
Milling CVD-PVD Methods Coating Grades
Degré revêtement méthodes CVD-PVD fraisage

| Grado Grades Degré | Microestructura Microestructure Microstructure | Grupo Material Pieza Trabajo Workpiece Material Group Groupe materiel piece travail | Aplicación Recomendada Recommended Application Application conseillée | | |
|---|---|---|---|---|---|
| C-526 | CVD  | P M K S N H ● ○ ● ○ ○ | - Sustrato de metal duro sin carburos<br>- Capa fina de recubrimiento depositada por metodo CVD<br>- Recomendada para materiales P-K y plaquitas con ángulo posición 90°<br>- Grandes secciones de viruta<br>- Buenas condiciones de corte y elevadas Vc sin refrigeración | - Substrate without carbides.<br>- Thin coated layer applied by MTCVD method<br>- Suitable for materials group P-K & cutting inserts with rake angle of 90°<br>- Big chip cross section<br>- Good cutting conditions and high Vc without coolant | - Substrat Carbure sans carbures<br>- Couche Fine Revêtement par méthode CVD<br>- Conseillée pour matériaux P-K et plaquettes avec angle de position 90°<br>- Grandes sections de copeaux<br>- Bonnes conditions de coupe et hautes Vc sans refroidissemment |
| P-605 | PVD  | P M K S N H ● ○ ○ ○ ○ ● | - Sustrato de micrograno sin carburos y bajo contenido de cobalto<br>- Recubrimiento nanocapa con contenido Al2 por metodo PVD<br>- Recomendada para condiciones de trabajo con elevada fatiga térmica<br>- Aplicación general<br>- Secciones de viruta corta. Elevadas Vc en condiciones estables | - Fine grained substrate without carbides with low cobalt content<br>- Nanostructural coating with high Al2 content, applied by PVD method<br>- Recommended for cutting conditions with high thermal stress<br>- General purpose. Small chip cross section. High Vc in stable conditions | - Substrat micrograin sans carbures et faible contenu en cobalt<br>- Revêtement nanocouche avec contenu AL2 par méthode PVD<br>- Conseillée pour conditions de travail avec faible fatigue thérmique<br>- Appl. générale. Sections copeaux courts, hautes Vc en conditions stables |
| P-610 | PVD  | P M K S N H ○ ● ● ○ ● ● | - Sustrato de micrograno sin carburos y bajo contenido de cobalto<br>- Recubrimiento nanocapa con contenido Al2 por metodo PVD<br>- Recomendada para condiciones de trabajo con elevada fatiga térmica<br>- Aplicación general<br>- Secciones de viruta corta. Elevadas Vc en condiciones estables | - Fine grained substrate without carbides with low cobalt content<br>- Nanostructural coating with high Al2 content, applied by PVD method<br>- Recommended for cutting conditions with high thermal stress<br>- General purpose. Small chip cross section. High Vc in stable conditions | - General purpose. Small chip cross section. High Vc in stable conditions<br>- Substrat micrograin sans carbures et faible contenu en cobalt<br>- Revêtement nanocouche avec contenu AL2 par méthode PVD<br>- Conseillée pour conditions de travail avec faible fatigue thérmique<br>- Appl. générale. Sections copeaux courts, hautes Vc en conditions stables |
| P-615 | PVD | P M K S N H ● ● ● ○ ● ● | - Sustrato de ultramicrograno sin carburos<br>- Nuevo recubrimiento de PVD<br>- Alta resistencia a la oxidación<br>- Medias y bajas secciones de viruta<br>- Medias a altas Vc en condiciones de trabajo estables | - Submicron substrate without carbides.<br>- New PVD coating<br>- High resistance against oxidation<br>- Lower up to medium chip cross-section<br>- Medium up to high cutting speed in stable working conditions | - Substrat ultramircrograin sans carbures<br>- Nouveau revêtement PVD<br>- Haute résistance à l´oxidation<br>- Moyennes et Faibles sections de copeaux<br>- Moyennes et Hautes Vc en conditions de travail stables |
| P-620 | PVD  | P M K S N H ● ● ● | - Sustrato de micrograno con alto contenido en carburos<br>- Recubrimiento de nanocapa con elevado contenido en Al2<br>- Recomendada para materiales del grupo P-M<br>- Moderados y elevados avances en condiciones estables | - Substrate with high content of carbides<br>- Nanostructural coating with high content of Al2<br>- Recommended for materials of groups P-M<br>- Medium up to high feed in stable conditions | - Substrat micrograin avec un haut contenu en carbures<br>- Revêtement nanocouche avec haut contenu en AL2<br>- Conseillée pour matériaux du groupe P-M<br>- Hauts et Modérés avances en conditions stables |
| P-625 | PVD | P M K S N H ● ● ● | - Sustrato de micrograno con alto contenido en carburos<br>- Recubrimiento de nanocapa con elevado contenido en Al2<br>- Recomendada para materiales del grupo P-M<br>- Moderados y elevados avances en condiciones estables | - Substrate with high content of carbides<br>- Nanostructural coating with high content of Al2<br>- Recommended for materials of groups P-M<br>- Medium up to high feed in stable conditions | - Substrat micrograin avec un haut contenu en carbures<br>- Revêtement nanocouche avec haut contenu en AL2<br>- Conseillée pour matériaux du groupe P-M<br>- Hauts et Modérés avances en conditions stables |
| P-630 | CVD | P M K N H ● ● ● ● ● ● | - Sustrato de ultramicrograno sin carburos con alto contenido en cobalto<br>- Nuevo recubrimiento de PVD con gran resistencia contra la oxidación<br>- Medias y bajas secciones de viruta<br>- Aplicable en todos grupos de materiales en condiciones desfavorables | - Submicron substrate without carbides with high content of cobalt<br>- New PVD coating with increased resistance against oxidation<br>- Low up to medium chip cross-section<br>- Suitable for all material groups in worse working conditions | - Substrat ultramicrograin sans carbures avec un haut contenu en cobalt<br>- Nouveau revêtement PVD avec haute résistance à l´oxidation<br>- Moyennes et faibles sections de copeaux<br>- Application sur tous les groupes de matériaux en conditions défavorables |
| P-640 | PVD | P M K S N H ● ● ● ● | - Sustrato de gran tenacidad sin carburos y elevado contenido en cobalto<br>- Nanorecubrimiento por metodo PVD<br>- Recomendada en condiciones de trabajo con elevada fatiga térmica<br>- Velocidades de corte bajas en condiciones inestables | - High tenacity substrate without carbides and high cobalt content<br>- Nanostructural coating a pplied by PVD method<br>- Recommended for cutting conditions with high thermal stress<br>- Low cutting speed in non-stable conditions | - Substrat très tenace sans carbures et haut contenu en cobalt<br>- Nanorevêtement par méthode PVD<br>- Conseillée en conditions de travail avec haute fatigue thermique<br>- Vitesses de coupe faible en conditions pas stables |
| P-010 | Sin rec. No coat.-Sans rev. | P M K S N H ○ ● ○ ● ○ | - Sustrato de submicrograno sin carburos y bajo contenido en cobalto<br>- Aplicación general en todos los materiales menos el grupo P<br>- Secciones de viruta corta en condiciones de trabajo estables | - Submicron substrate without carbides and low content of cobalt<br>- General purpose for all materials but group P<br>- Small chip cross-section in stable working conditions | - Substrat submicrograin sans carbures et faible contenu en cobalt<br>- Application générale sur tous les matériaux sauf le groupe P<br>- Sections de copeaux courtes en conditions de travail stables |

# PORTA-PLAQUITAS FRESADO ALTO AVANCE
## High Feed Tool-Holders
## Porte-Plaquettes Fraisage haute avance

ALTO AVANCE
High Feed
Haute avance

**REFRIGERACIÓN INTERIOR -** Internal Cooling - Lubrification interne

Ref. 8231
**SLO-03**

Ref. 8232
**A50060**

Ref. 8233
**SWN-09**

Ref. 8234
**SSD-12**

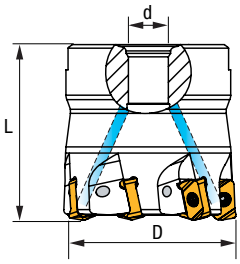
Ref. 8261
**SLO-03**

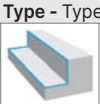
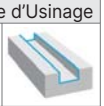
Ref. 8262
**SSD-12**

# Ref. 8231

## PORTA-PLAQUITAS FRESADO ALTO AVANCE SLO-03 REFRIGERACIÓN INTERIOR
Internal Cooling SLO-03 High Feed Tool-Holder
Porte-Plaquettes fraisage haute avance SLO-03 lubrification interne

New!



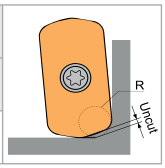

| Tipo Mecanizado<br>Machining Type - Type d'Usinage | | |
|---|---|---|
| |  |  |
| ● | | |
| | | |
| ● | | |

| ISO | ø D | ø d H7 | Z | L | N° Art. | € | Ref. 8804 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 40E6R40-SLO03 | 40 | 16 | 6 | 40 | 48491 | **223,56** | **M3×7**<br>Art. 70192<br>**3,42 €** | 5 | **ZT-8**<br>Art. 10506<br>**11,06 €** | 1 |
| 50E7R50-SLO03 | 50 | 22 | 7 | 50 | 48500 | **261,30** | | | | |
| 63E9R50-SLO03 | 63 | 22 | 9 | 50 | 70191 | **319,77** | | | | |

**Plaquita** / Insert / Plaquette:
**Pag. 628**

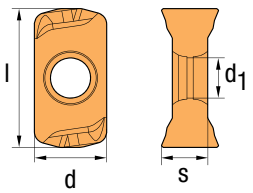
| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

**Programación del radio de esquina**
Programming of the corner radius
Programmation du rayon de coin

| Descripción<br>Designation<br>Description | Approx. R (mm) | | |
|---|---|---|---|
| | Input R | Uncut | |
| LOGX-030310 | 1,6 | 0,39 |  |



| Condiciones Corte<br>Cutting Conditions<br>Conditions coupe | |
|---|---|
| f<br>mm | $a_p$<br>mm |
| 0,30-1,60 | 0,30-0,90 |




## LOGX

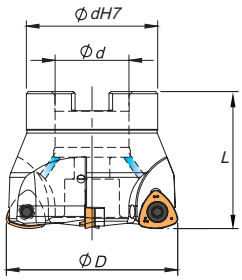
| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones<br>Dimensions | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | l | d | s | $d_1$ |
| LOGX-030310-ZSG | | | | | | | ● | ● | | 11,90 | 6,20 | 3,96 | 3,45 |

**Plaquita** / Insert / Plaquette:
**Pag. 628**

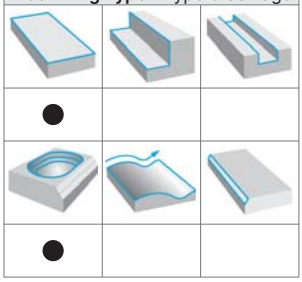
# Ref. 8232

## PORTA-PLAQUITAS FRESADO ALTO AVANCE A50060 REFRIGERACIÓN INTERIOR
Internal Cooling A50060 Milling High Feed Tool-Holder
Porte-Plaquettes fraisage haute avance A50060 lubrification interne

**TRABAJO DE INTERPOLACIÓN**
**Interpolation Work**
Travail d'Interpolation




**Tipo Mecanizado**
**Machining Type** - Type d'Usinage



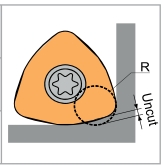
| ISO | D | dH7 | L | Z | N° Art. | € | Ref. 8804 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **052-A50060-03** | 52 | 22 | 45 | 3 | 59764 | **477,89** | **Z-052-80** Art. 59770 **8,65 €** | 5 | **ZT-20** Art. 13845 **11,06 €** | 1 |
| **063-A50060-04** | 63 | 27 | 50 | 4 | 59765 | **547,07** | | | | |
| **080-A50060-05** | 80 | 27 | 50 | 5 | 59766 | **633,08** | | | | |

**Plaquita** / Insert / Plaquette:
**Pag. 635**

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

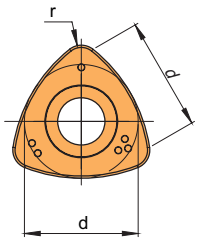
**Programación del radio de esquina**
Programming of the corner radius
Programmation du rayon de coin

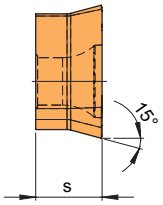
| Descripción Designation Description | Approx. R (mm) | |
|---|---|---|
| | Input R | Uncut |
| **WNMW-1207SP** | 3,50 | 0,90 |




| Condiciones Corte Cutting Conditions Conditions coupe | |
|---|---|
| $f_z$ mm | $a_p$ mm |
| 0,30-1,50 | 1,80 |

**WNMW**



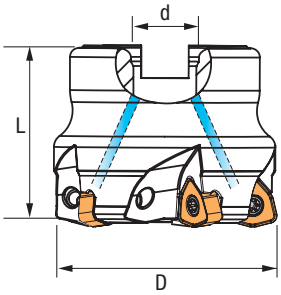

| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones Dimensions | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | d | s | r |
| **WNMW-1207SP** | | | ● | | ● | | | | | 12 | 7,00 | 2 |

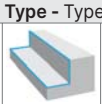
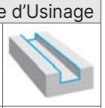
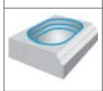
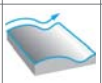
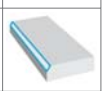
**Plaquita** / Insert / Plaquette:
**Pag. 635**

# Ref. 8233

## PORTA-PLAQUITAS FRESADO ALTO AVANCE SWN-09 REFRIGERACIÓN INTERIOR
Internal Cooling SWN-09 High Feed Tool-Holder
Porte-Plaquettes Fraisage haute avance SWN-09 lubrification interne

New!



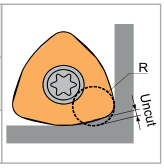

| Tipo Mecanizado<br>Machining Type - Type d'Usinage | | |
|---|---|---|
| |  |  |
| ● | | |
|  |  |  |
| ● | | |

| ISO | D | dH7 | L | Z | N° Art. | € | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 040E4R40-SWN09 | 40 | 16 | 40 | 4 | 48647 | **171,30** | **M3×7** Art. 70192 **3,42 €** | 5 | **ZT-8** Art. 10506 **11,06 €** | 1 |
| 050E5R40-SWN09 | 50 | 22 | 40 | 5 | 48650 | **200,22** | | | | |
| 063E6R40-SWN09 | 63 | 22 | 40 | 6 | 74821 | **245,03** | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 636**

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

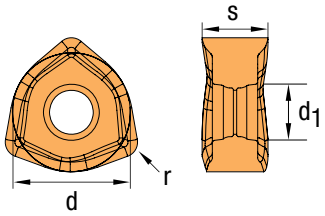
**Programación del radio de esquina**
Programming of the corner radius
Programmation du rayon de coin

| Descripción Designation Description | Approx. R (mm) | |  |
|---|---|---|---|
| | Input R | Uncut | |
| WNMX09T3 | 2,5 | 0,60 | |



| Condiciones Corte<br>Cutting Conditions<br>Conditions coupe | |
|---|---|
| f mm | $a_p$ mm |
| 0,40-1,50 | 0,40-1,35 |

**WNMX**




| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones Dimensions | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | d | s | r | $d_1$ |
| WNMX-09T316-ZMG | | | | | | | ● | ● | | 9,53 | 3,97 | 1,60 | 3,60 |

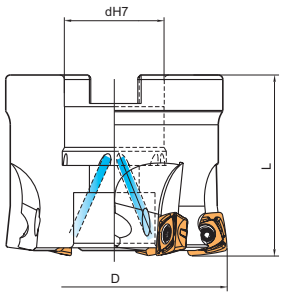
**Plaquita** / Insert / Plaquette: **Pag. 636**

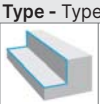
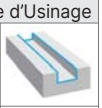
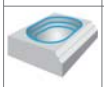
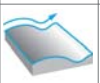
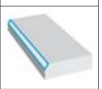
# Ref. 8234

## PORTA-PLAQUITAS FRESADO ALTO AVANCE SSD-12 REFRIGERACIÓN INTERIOR
Internal Cooling SSD-12 High Feed Tool-Holder
Porte-Plaquettes Fraisage haute avance SSD-12 lubrification interne

New!

ALTO AVANCE
High Feed
Haute avance



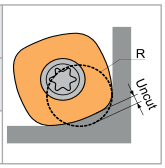

| Tipo Mecanizado<br>Machining Type - Type d'Usinage | | |
|---|---|---|
| |  |  |
| ● | | |
|  |  |  |
| ● | | |

| ISO | D | dH7 | L | Z | N° Art. | € | Ref. 8804 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **50E4R40-SSD12** | 50 | 22 | 40 | 4 | 77740 | **222,38** | **M4×8**<br>Art. 77794<br>**3,42 €** | 5 | **ZT-15**<br>Art. 10512<br>**11,06 €** | 1 |
| **63E5R40-SSD12** | 63 | 22 | 40 | 5 | 77749 | **270,47** | | | | |

**Plaquita** / Insert / Plaquette:
**Pag. 630**

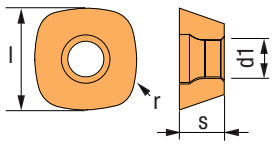
| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

**Programación del radio de esquina**
Programming of the corner radius
Programmation du rayon de coin

| Descripción<br>Designation<br>Description | Approx. R (mm) | | |
|---|---|---|---|
| | Input R | Uncut | |
| **SDMT1205** | 4,5 | 0,83 |  |



| Condiciones Corte<br>Cutting Conditions<br>Conditions coupe | |
|---|---|
| **f**<br>**mm** | **$a_p$**<br>**mm** |
| 0,50-1,80 | 0,30-1,50 |



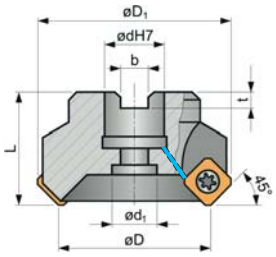

## SDMT

| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones<br>Dimensions | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | l | s | r | $d_1$ |
| **SDMT-1205ZDTN-ZMG** | | | | | ● | | ● | | | 12,7 | 5,56 | 15 | 4,60 |

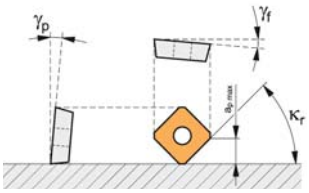
**Plaquita** / Insert / Plaquette:
**Pag. 630**

# Ref. 8230

## PORTA-PLAQUITAS FRESADO S45SE12F-45° REFRIGERACIÓN INTERIOR
Internal Cooling S45SE12F-45° Milling Tool-Holder
Porte-Plaquettes fraisage S45SE12F-45° lubrification interne



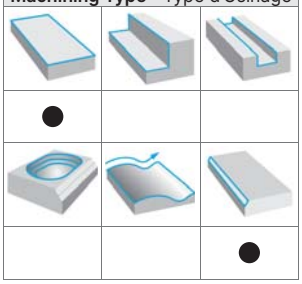

| | | | |
|---|---|---|---|
| $\gamma_p$ | +18° | $K_r$ | 45° |
| $\gamma_f$ | -6° | $a_{p\ max}$ | 6,00 mm |




| ISO | D | dH7 | L | $D_1$ | Z | N° Art. | € |
|---|---|---|---|---|---|---|---|
| **050R-S45SE12F** | 50 | 22 | 40 | 62 | 4 | 20566 | **266,81** |
| **063R-S45SE12F** | 63 | 22 | 50 | 75 | 5 | 20567 | **328,68** |
| **080R-S45SE12F** | 80 | 27 | 50 | 92 | 6 | 20596 | **465,51** |
| **100R-S45SE12F** | 100 | 32 | 50 | 112 | 6 | 20600 | **546,45** |
| **125R-S45SE12F** | 125 | 40 | 63 | 132 | 7 | 20607 | **695,18** |

| Ref. 8804 | | Ref. 8804 | | Ref. 8801 | |
|---|---|---|---|---|---|
| **Z-155** Art. 21009 **3,97€** | 5 | **Z-910** Art. 20998 **4,56 €** | 5 | **ZT-20** Art. 13845 **11,06 €** | 1 |
| | | **Z-912** Art. 20999 **3,82 €** | 5 | | |
| | | **Z-917** Art. 21001 **7,11 €** | 5 | | |
| | | - | | | |

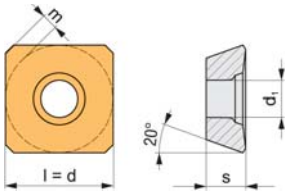
**Tipo Mecanizado**
**Machining Type** - Type d'Usinage



**Plaquita** / Insert / Plaquette: **Pag. 630, 632**

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

**SEHT**



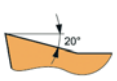

| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones Dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | l | d | s | $d_1$ | $m_\varepsilon$ |
| **SEHT 1204AFSN** | ● | | | | | | | | | 12,70 | 12,70 | 4,76 | 5,50 | 1,6 |
| **SEHT 1204AFTN** | | | | | ● | | | ● | | 12,70 | 12,70 | 4,76 | 5,50 | 1,6 |
| **SEHT 1204AFFN-FA** | | | ● | | | | | | ● | 12,70 | 12,70 | 4,76 | 5,50 | 1,6 |

**Plaquita** / Insert / Plaquette: **Pag. 630, 632**

**SEHT FA**

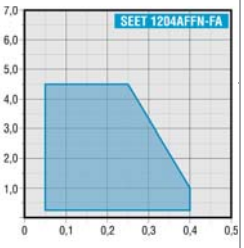
**Foto** Picture Photo

**Filo Corte** Cutting Edge Arête coupe




**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | | | | | ● | |
| Desb. Medio Roug. & Finish. Semi-Finition | | | | | ● | |
| Desb. Grueso Coarse Rough. Ébauche | | | | | ● | |



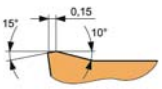

**Condiciones Corte** Cutting Conditions Conditions coupe

| | |
|---|---|
| $f_z$ | 0,10-0,30 mm/z |
| $a_p$ | 1,00-6,00 mm |

**SEHT**

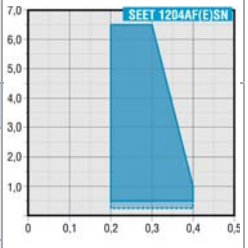
**Foto** Picture Photo

**Filo Corte** Cutting Edge Arête coupe




**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | ● | ● | ○ | ○ | | ○ |
| Desb. Medio Roug. & Finish. Semi-Finition | ● | ● | ○ | ○ | | ○ |
| Desb. Grueso Coarse Rough. Ébauche | ● | ● | ○ | ○ | | ○ |



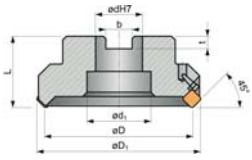

**Condiciones Corte** Cutting Conditions Conditions coupe

| | |
|---|---|
| $f_z$ | 0,10-0,30 mm/z |
| $a_p$ | 1,00-6,00 mm |

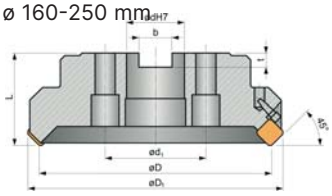
# Ref. 8235

## PORTA-PLAQUITAS FRESADO W45SE123F-45°
W45SE123F-45° Milling Tool-Holder
Porte-Plaquettes fraisage W45SE123F-45°

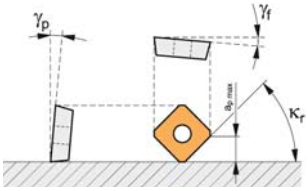
ø63-125mm



ø 160-250 mm



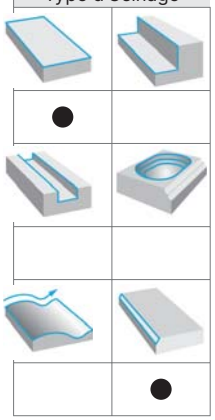
| | | | |
|---|---|---|---|
| $\gamma_p$ | +18° | $K_r$ | 45° |
| $\gamma_f$ | -3° | $a_{p\ max}$ | 6,5 mm |



| ISO | D | dH7 | L | $D_1$ | Z | N° Art. | € |
|---|---|---|---|---|---|---|---|
| **080R-W45SE1203F** | 80 | 27 | 50 | 98 | 6 | 20608 | **488,72** |
| **100R-W45SE1203F** | 100 | 32 | 50 | 108 | 6 | 20614 | **573,81** |
| **125R-W45SE1203F** | 125 | 40 | 63 | 139 | 7 | 20616 | **730,00** |
| **160R-W45SE1203F** | 160 | 40 | 63 | 174 | 8 | 20617 | **923,18** |

| Ref. 8804 | Ref. 8806 | Ref. 8809 | Ref. 8814 | Ref. 8804 |
|---|---|---|---|---|
| 5 | 5 | 5 | 5 | **Z-912** Art. 20999 **3,82 €** 5 |
| **Z-106** Art. 21004 **2,52 €** | **Z-206** Art. 21367 **2,83 €** | **Z-301** Art. 21372 **10,12 €** | **3×10** Art. 10955 **1,36 €** | **Z-917** Art. 21001 **7,11 €** 5 |
| | | | | - |
| | | | | **Z-952** Art. 21003 **3,82 €** 5 |

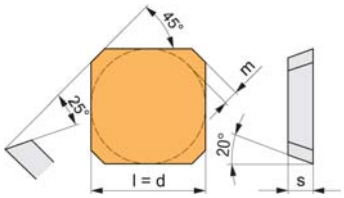
**Tipo Mecanizado**
**Machining Type**
Type d'Usinage

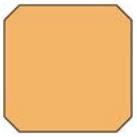


**Plaquita** / Insert / Plaquette: **Pag. 630**

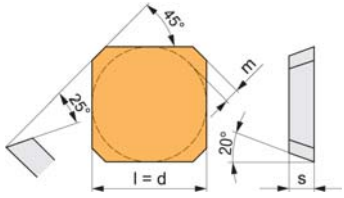
| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Arandela** - Clamp - Rondelle |
| | **Placa Base** - Base Plate - Plaque de base |
| | **Pasador** - Pin - Goupille |
| | **Tornillo** - Screw - Vis |

**SEKR**



**SEKN**




| ISO | Calidades Qualities Qualités C-526 | P-620 | P-640 | Dimensiones Dimensions l | d | s | $m_c$ |
|---|---|---|---|---|---|---|---|
| **SEKR-1203AFSN** | ● | ● | ● | 12,70 | 12,70 | 3,18 | 1,6 |
| **SEKN-1203AFSN** | ● | ● | | 12,70 | 12,70 | 3,18 | 1,6 |

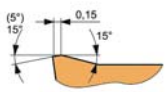
**Plaquita** / Insert / Plaquette: **Pag. 630**

### SEKR

Geometría / Geometry / Géométrie

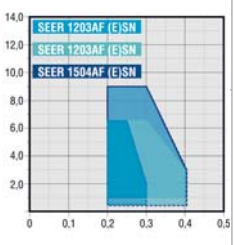
Foto / Picture / Photo

**Filo Corte**
Cutting Edge
Arête coupe



**Grupo Materiales Pieza Trabajo**
Workpiece Material Group
Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | ● | ● | ○ | ○ | | ○ |
| Desb. Medio Roug. & Finish. Semi-Finition | ● | ● | ○ | ○ | | ○ |
| Desb. Grueso Coarse Rough. Ébauche | ● | ● | ○ | ○ | | ○ |




**Condiciones Corte**
Cutting Conditions
Conditions coupe

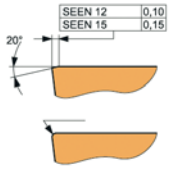
| | |
|---|---|
| $f_z$ | **Segun Dimensiones plaquita** According to insert dimensions Suivant dimensions plaquette |
| $a_p$ | |

### SEKN

Geometría / Geometry / Géométrie

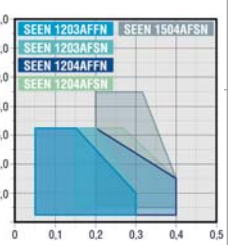
Foto / Picture / Photo

**Filo Corte**
Cutting Edge
Arête coupe




**Grupo Materiales Pieza Trabajo**
Workpiece Material Group
Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | ○ | ○ | ● | | | ● |
| Desb. Medio Roug. & Finish. Semi-Finition | ○ | ○ | ● | | | ● |
| Desb. Grueso Coarse Rough. Ébauche | ○ | ○ | ● | | | ● |

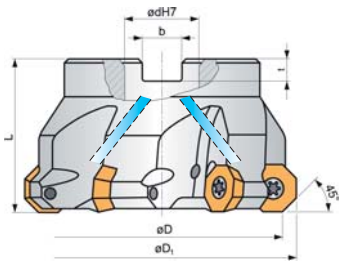



**Condiciones Corte**
Cutting Conditions
Conditions coupe

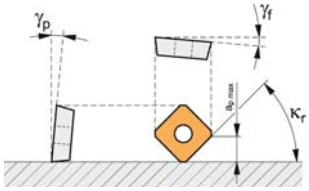
| | |
|---|---|
| $f_z$ | **Segun Dimensiones plaquita** According to insert dimensions Suivant dimensions plaquette |
| $a_p$ | |

# Ref. 8240

## PORTA-PLAQUITAS FRESADO S45OD06-45° REFRIGERACIÓN INTERIOR
Internal Cooling S45OD06-45° Milling Tool-Holder
Porte-Plaquettes fraisage S45OD06-45° lubrification interne




| | | | |
|---|---|---|---|
| $\lambda_p$ | +5° | $K_r$ | 45° |
| $\lambda_f$ | 0° | $a_{pmax}$ | 8,6 mm |




| ISO | D | dH7 | L | Z | N° Art. | € |
|---|---|---|---|---|---|---|
| 063R-S45OD06 | 63 | 27 | 50 | 5 | 20623 | 297,35 |
| 080R-S45OD06 | 80 | 32 | 50 | 6 | 20656 | 410,59 |
| 100R-S45OD06 | 100 | 40 | 50 | 7 | 20659 | 526,46 |
| 125R-S45OD06 | 125 | 40 | 63 | 8 | 20660 | 903,70 |

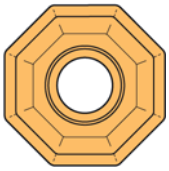
| Ref. 8804 | Ref. 8804 | | Ref. 8801 |
|---|---|---|---|
| 5 | Z-912 Art. 20999 **3,82 €** | 5 | 1 |
| **Z-125** Art. 21008 **3,97 €** | Z-917 Art. 21001 **7,11 €** | 5 | **ZT-07** Art. 19569 **11,06 €** |
| | Z-920 Art. 21002 **12,67 €** | 5 | |
| | - | | |

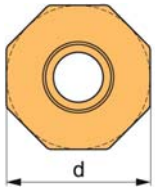
**Tipo Mecanizado**
**Machining Type** - Type d'Usinage

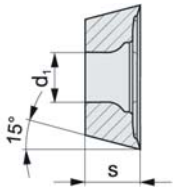
| | | |
|---|---|---|
| | | |
| ● | | |
| | | |
| | | ● |

**Plaquita** / Insert / Plaquette: **Pag. 627**

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |






**ODMT**

| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones Dimensions | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | d | s | $d_1$ |
| ODMT 0605ZZN | ● | | | | | | ● | ● | | 15,87 | 5,56 | 5,50 |

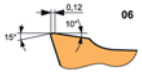
**Plaquita** / Insert / Plaquette: **Pag. 627**

Geometría / Geometry / Géométrie

**ODMT**

**Foto**
Picture
Photo

**Filo Corte**
Cutting Edge
Arête coupe



**Grupo Materiales Pieza Trabajo**
Workpiece Material Group
Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | ● | ○ | ● | ○ | | ○ |
| Desb. Medio Roug. & Finish. Semi-Finition | ● | ○ | ● | ○ | | ○ |
| Desb. Grueso Coarse Rough. Ebauche | ● | ○ | ● | | | |

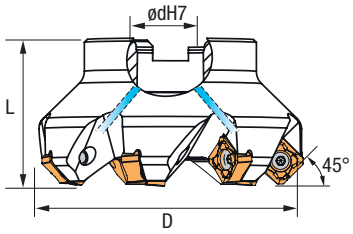
**Condiciones Corte**
Cutting Conditions
Conditions coupe

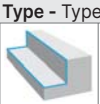
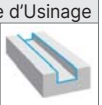
| | |
|---|---|
| $f_z$ | 0,15-0,45 mm/z |
| $a_p$ | 1,00-8,60 mm |

# Ref. 8236

## PORTA-PLAQUITAS FRESADO S45SN12 REFRIGERACIÓN INTERIOR
Internal Cooling S45SN12 Tool-Holder
Porte-Plaquettes Fraisage S45SN12 lubrification interne

New!



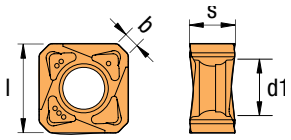

| Tipo Mecanizado<br>Machining Type - Type d'Usinage | | |
|---|---|---|
| |  |  |
| ● | | |
| | | |
| | | ● |

| ISO | D | dH7 | L | Z | N° Art. | € | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 050E5R40-S45SN12 | 50 | 22 | 40 | 5 | 70916 | **228,44** | **M5×12** Art. 70746 **3,42 €** | 5 | **ZT-20** Art. 13845 **11,06 €** | 1 |
| 063E6R40-S45SN12 | 63 | 22 | 40 | 6 | 48653 | **261,55** | | | | |
| 080E7R50-S45SN12 | 80 | 27 | 50 | 7 | 70949 | **304,58** | | | | |
| 100E8R50-S45SN12 | 100 | 32 | 50 | 8 | 70955 | **397,28** | | | | |
| 125E10R63-S45SN12 | 125 | 40 | 63 | 10 | 70986 | **536,33** | | | | |

**Plaquita** / Insert / Plaquette:
**Pag. 633**

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

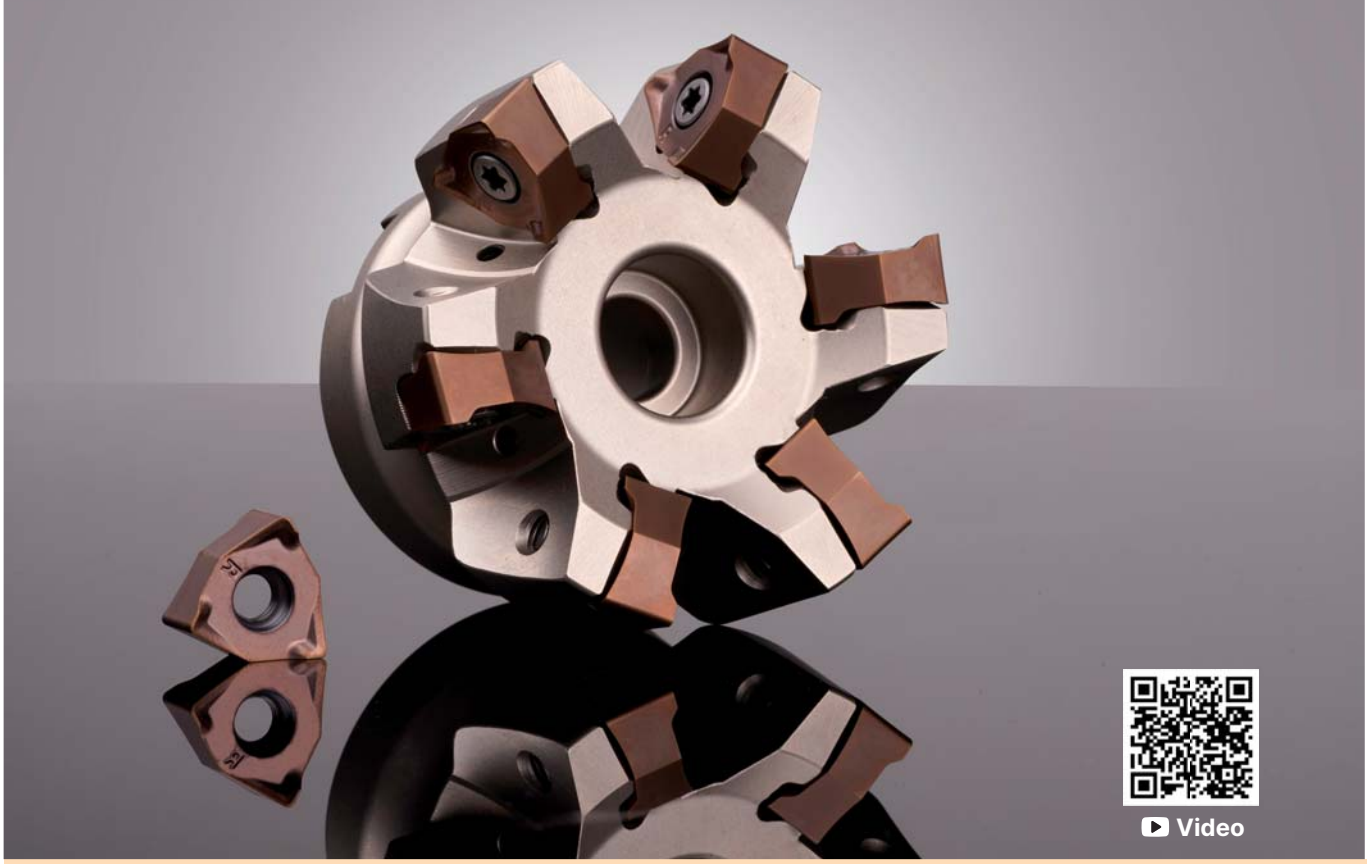
| Condiciones Corte<br>Cutting Conditions<br>Conditions coupe | |
|---|---|
| **f mm** | **$a_p$ mm** |
| 0,08-0,30 | 0,30-6,00 |




**SNMX**

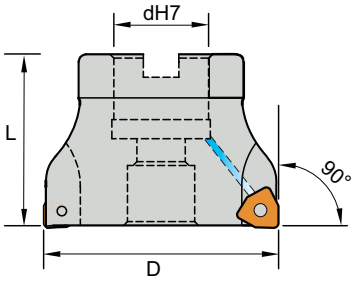
| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones Dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | l mm | d mm | s mm | b mm | $d_1$ mm |
| SNMX-1205-ZMG | | | | | | | ● | ● | | 12,7 | 12,7 | 6,4 | 1,5 | 6 |
| SNMX-1205-ZRG | | | | | | | ● | ● | | 12,7 | 12,7 | 6,4 | 1,5 | 6 |

**Plaquita** / Insert / Plaquette:
**Pag. 633**

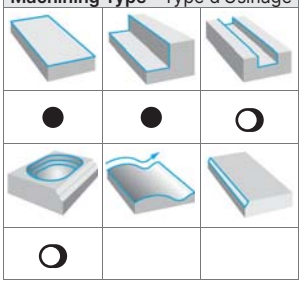



# Ref. 8241

**PORTA-PLAQUITAS FRESADO ESCUADRA S90XN08 REFRIGERACIÓN INTERIOR**
Internal Cooling S90XN08 Square Milling Tool-Holder
Porte-Plaquettes fraisage équerre S90XN08 lubrification interne



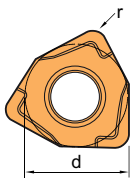

**Tipo Mecanizado**
**Machining Type -** Type d'Usinage

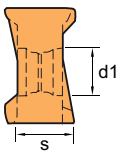


| ISO | D | dH7 | Z | L | N° Art. | € | 8804 | | 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 050B5R-S90XN08 | 50 | 22 | 5 | 45 | 17144 | 226,79 | M4×12,5 Art. 20689 3,42 € | 5 | ZT-15 Art. 10512 11,06 € | 5 |
| 063B6R-S90XN08 | 63 | 22 | 6 | 45 | 17147 | 268,88 | | | | |
| 080B7R-S90XN08 | 80 | 27 | 7 | 50 | 17208 | 348,99 | | | | |
| 100B7R-S90XN08 | 100 | 32 | 7 | 52 | 17256 | 447,50 | | | | |
| 125B10R-S90XN08 | 125 | 40 | 10 | 60 | 17267 | 614,97 | | | | |

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

**Plaquita** / Insert / Plaquette: **Pag. 634**




| Condiciones Corte Cutting Conditions Conditions coupe | |
|---|---|
| f mm | $a_p$ mm |
| 0,10-0,30 | 0,30-7,00 |

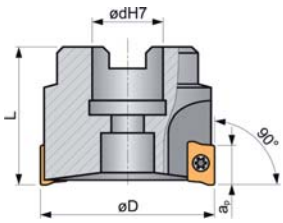
## XNMX

| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones Dimensions | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | d mm | s mm | $d_1$ mm | r mm |
| XNMX-080608-ZMG | | | | | ● | | ● | | | 12,53 | 6,5 | 4,5 | 0,8 |
| XNMX-080608-ZRG | | | | | | | | ● | | 12,53 | 6,5 | 4,5 | 0,8 |

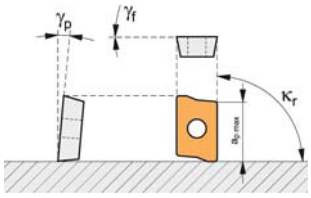
**Plaquita** / Insert / Plaquette: **Pag. 634**

# Ref. 8245

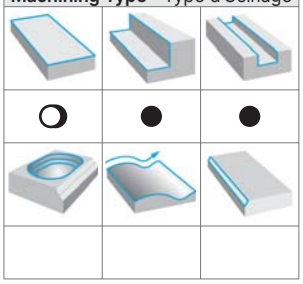
## PORTA-PLAQUITAS FRESADO ESCUADRA S90AP10D-90°
S90AP10D-90° Square Milling Tool-Holder
Porte Plaquettes fraisage équerre S90AP10D-90°




| | | | |
|---|---|---|---|
| $\gamma_p$ | +3° | $K_r$ | 90° |
| $\gamma_f$ | 0° | $a_{p\,max}$ | 9 mm |




**Tipo Mecanizado**
**Machining Type** - Type d'Usinage

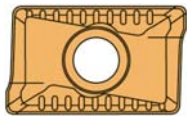


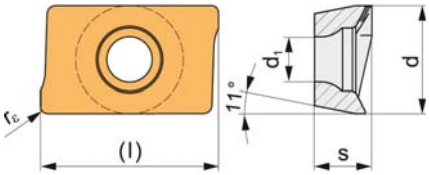
| ISO | D | dH7 | L | Z | N° Art. | € |
|---|---|---|---|---|---|---|
| **040R-S90AP10D** | 40 | 16 | 40 | 6 | 20662 | **298,68** |
| **050R-S90AP10D** | 50 | 22 | 40 | 7 | 20665 | **317,91** |
| **063R-S90AP10D** | 63 | 22 | 50 | 9 | 20670 | **394,82** |

| Ref. 8816 | Ref. 8804 | | Ref. 8801 |
|---|---|---|---|
| 5 | **Z-105** Art. 20997 **2,98 €** | 5 | 1 |
| **T-07** Art. 10846 **3,20 €** | **Z-910** Art. 20998 **4,56 €** | 5 | **ZT-07** Art. 19569 **11,06 €** |

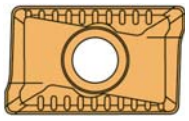
**Plaquita** / Insert / Plaquette: **Pag. 626**

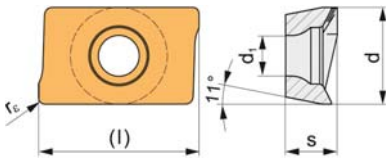
| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |






## APKT






## APET FA
Al

| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones Dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | l | d | s | $d_1$ | $r_\varepsilon$ |
| **APKT 1003PDER-M** | ● | | | | ● | | ● | ● | | 10 | 6,7 | 3,50 | 2,88 | 0,5 |
| **APET 1003PDFR-FA** | | | | | | | | | ● | 10 | 6,7 | 3,50 | 2,88 | 0,5 |

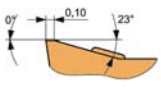
**Plaquita** / Insert / Plaquette: **Pag. 626**

**APKT-10..**

Geometría / Geometry / Géométrie

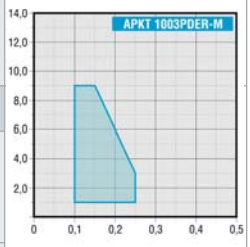
**Foto** Picture Photo

**Filo Corte** Cutting Edge Arête coupe




**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| | Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|---|
| Acabado Finishing Finition | | ● | ● | ● | ○ | | |
| Desb. Medio Roug. & Finish. Semi-Finition | | ● | ● | ● | ○ | | |
| Desb. Grueso Coarse Rough. Ébauche | | ○ | ○ | ○ | ○ | | |




**Condiciones Corte** Cutting Conditions Conditions coupe

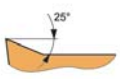
| | |
|---|---|
| $f_z$ | 0,08-0,20 mm/z |
| $a_p$ | 1,00-9,00 mm |

**APET FA**

Geometría / Geometry / Géométrie

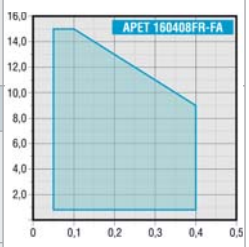
**Foto** Picture Photo

**Filo Corte** Cutting Edge Arête coupe




**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| | Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|---|
| Acabado Finishing Finition | | | | | | ● | |
| Desb. Medio Roug. & Finish. Semi-Finition | | | | | | ● | |
| Desb. Grueso Coarse Rough. Ébauche | | | | | | ● | |

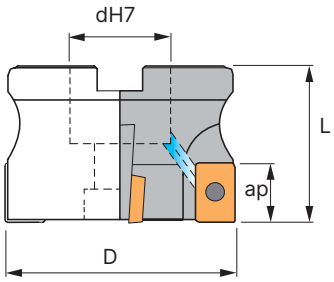



**Condiciones Corte** Cutting Conditions Conditions coupe

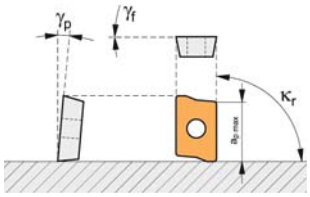
| | |
|---|---|
| $f_z$ | 0,07-0,20 mm/z |
| $a_p$ | 1,00-9,00 mm |

# Ref. 8247

## PORTA-PLAQUITAS FRESADO ESCUADRA S90AP10D-RF-90º REFRIGERACIÓN INTERIOR
Internal Cooling S90AP10D-RF-90º-Square Milling Tool-Holder
Porte-Plaquettes fraisage équerre S90AP10D-RF-90º lubrification interne



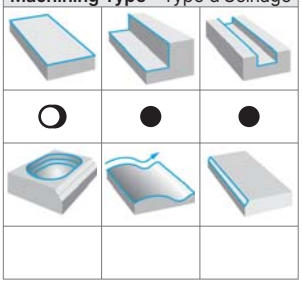

| | | | |
|---|---|---|---|
| $\gamma_p$ | +3° | $K_r$ | 90° |
| $\gamma_f$ | 0° | $a_{p\ max}$ | 9 mm |




| ISO | D | dH7 | L | Z | Nº Art. | € |
|---|---|---|---|---|---|---|
| 040R-S90AP10D-RF | 40 | 16 | 40 | 6 | 80595 | 364,52 |
| 050R-S90AP10D-RF | 50 | 22 | 40 | 7 | 80596 | 388,37 |
| 063R-S90AP10D-RF | 63 | 22 | 50 | 9 | 80597 | 480,35 |

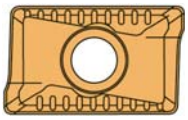
| Ref. 8816 | Ref. 8804 | | Ref. 8801 |
|---|---|---|---|
| 5 | Z-105 Art. 20997 **2,98 €** | 5 | 1 |
| **T-07** Art. 10846 **3,20 €** | Z-910 Art. 20998 **4,56 €** | 5 | **ZT-07** Art. 19569 **11,06 €** |

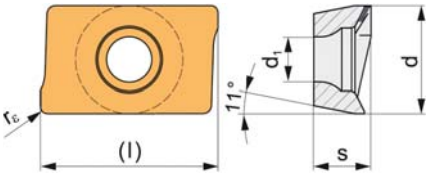
**Tipo Mecanizado**
**Machining Type** - Type d'Usinage



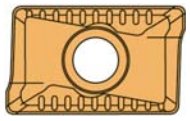
**Plaquita** / Insert / Plaquette: **Pag. 626**

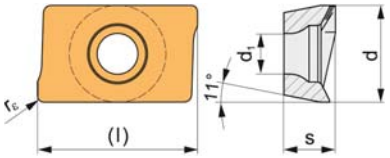
| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |






## APKT






## APET FA
Al

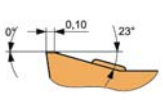
| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones Dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | l | d | s | $d_1$ | $r_\epsilon$ |
| APKT 1003PDER-M | ● | | | | ● | | ● | ● | | 10 | 6,7 | 3,50 | 2,88 | 0,5 |
| APET 1003PDFR-FA | | | | | | | | | ● | 10 | 6,7 | 3,50 | 2,88 | 0,5 |

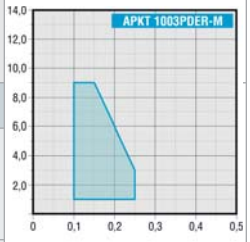
**Plaquita** / Insert / Plaquette: **Pag. 626**

**APKT-10..**

| Geometría Geometry Géométrie | Foto Picture Photo | Grupo Materiales Pieza Trabajo Workpiece Material Group Groupe matériaux pièce travail | P | M | K | S | N | H |
|---|---|---|---|---|---|---|---|---|
| | | Fresado Milling Fraisage | | | | | | |
| | | Acabado Finishing Finition | ● | ● | ● | ○ | | |
| | | Desb. Medio Roug. & Finish. Semi-Finition | ● | ● | ● | ○ | | |
| | | Desb. Grueso Coarse Rough. Ébauche | ○ | ○ | ○ | ○ | | |

**Filo Corte**
Cutting Edge
Arête coupe



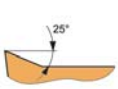

**Condiciones Corte**
Cutting Conditions
Conditions coupe

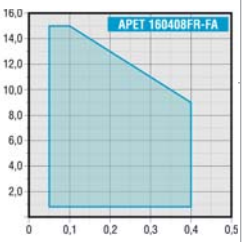
| | |
|---|---|
| $f_z$ | 0,08-0,20 mm/z |
| $a_p$ | 1,00-9,00 mm |

**APET FA**

| Geometría Geometry Géométrie | Foto Picture Photo | Grupo Materiales Pieza Trabajo Workpiece Material Group Groupe matériaux pièce travail | P | M | K | S | N | H |
|---|---|---|---|---|---|---|---|---|
| | | Fresado Milling Fraisage | | | | | | |
| | | Acabado Finishing Finition | | | | | ● | |
| | | Desb. Medio Roug. & Finish. Semi-Finition | | | | | ● | |
| | | Desb. Grueso Coarse Rough. Ébauche | | | | | ● | |

**Filo Corte**
Cutting Edge
Arête coupe



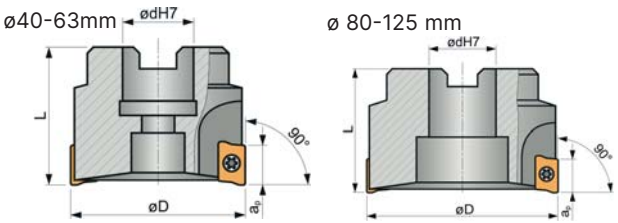




**Condiciones Corte**
Cutting Conditions
Conditions coupe

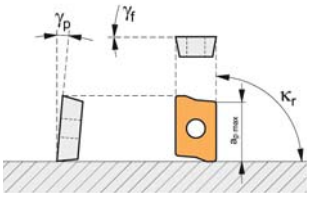
| | |
|---|---|
| $f_z$ | 0,07-0,20 mm/z |
| $a_p$ | 1,00-9,00 mm |

# Ref. 8250

## PORTA-PLAQUITAS FRESADO ESCUADRA S90AP16D-90°
S90AP16D-90° Square Milling Tool-Holder
Porte-Plaquettes fraisage équerre S90AP16D-90°

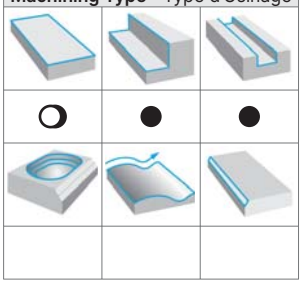



| | | | |
|---|---|---|---|
| $\gamma_p$ | +6° | $K_r$ | 90° |
| $\gamma_f$ | 0° | $a_{p\,max}$ | 13,50 mm |



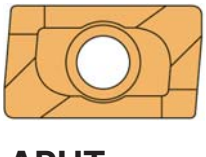

| ISO | D | dH7 | L | Z | N° Art. | € | Ref. 8816 | Ref. 8804 | Ref. 8801 |
|---|---|---|---|---|---|---|---|---|---|
| 050R-S90AP16D | 50 | 22 | 40 | 5 | 20671 | 266,81 | 5 | Z-910 Art. 20998 4,56 € 5 | 1 |
| 063R-S90AP16D | 63 | 27 | 50 | 6 | 20674 | 316,32 | T-15 Art. 10895 3,42 € | Z-912 Art. 20999 3,82 € 5 | ZT-15 Art. 10512 11,06 € |
| 080R-S90AP16D | 80 | 27 | 50 | 7 | 20683 | 410,59 | | | |
| 100R-S90AP16D | 100 | 32 | 50 | 8 | 20692 | 526,46 | | Z-916 Art. 21000 3,82 € 5 | |
| 125R-S90AP16D | 125 | 40 | 63 | 8 | 20693 | 723,49 | | - | |

**Tipo Mecanizado**
**Machining Type** - Type d'Usinage

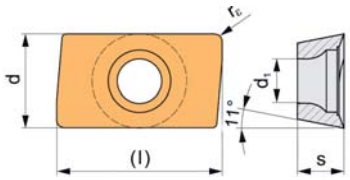


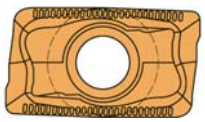
**Plaquita** / Insert / Plaquette: **Pag. 626, 627**

**Tornillo** - Screw - Vis | **Tornillo** - Screw - Vis | **Destornillador** - Screwdriver - Tournevis

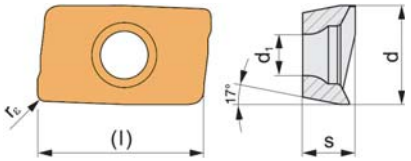


## APHT



## APKT



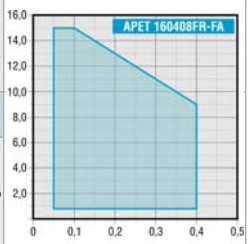

| ISO | Calidades / Qualities / Qualités C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | Dimensiones Dimensions l | d | s | $d_1$ | $r_\epsilon$ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| APHT 160408FR-FA | | | | | | | | | ● | 16 | 9,45 | 5,35 | 4,5 | 0,8 |
| APKT 1604PDER | ● | | | | ● | | ● | ● | | 16 | 9,45 | 5,35 | 4,6 | 0,8 |

**Plaquita** / Insert / Plaquette: **Pag. 626, 627**

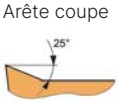
### APHT

Geometría Geometry Géométrie | Foto Picture Photo | Grupo Materiales Pieza Trabajo Workpiece Material Group Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | | | | | ● | ○ |
| Desb. Medio Roug. & Finish. Semi-Finition | | | | | ● | ○ |
| Desb. Grueso Coarse Rough. Ébauche | | | | | ● | ○ |




**Filo Corte** Cutting Edge Arête coupe



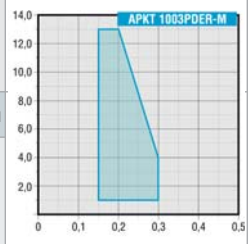

**Condiciones Corte** Cutting Conditions Conditions coupe

| | |
|---|---|
| $f_z$ | 0,07-0,20 mm/z |
| $a_p$ | 1,00-13,50 mm |

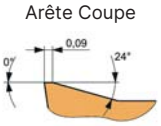
### APKT-PDER

Geometría Geometry Géométrie | Foto Picture Photo | Grupo Materiales Pieza Trabajo Workpiece Material Group Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | ● | ● | ● | | ● | |
| Desb. Medio Roug. & Finish. Semi-Finition | ● | ● | ● | | ● | |
| Desb. Grueso Coarse Rough. Ébauche | ● | ● | ● | | ○ | |




Filo Corte Cutting Edge Arête Coupe

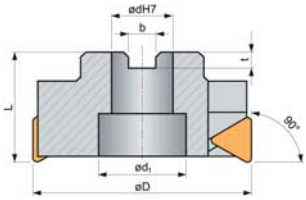



**Condiciones Corte** Cutting Conditions Conditions coupe

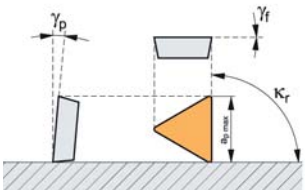
| | |
|---|---|
| $f_z$ | 0,07-0,20 mm/z |
| $a_p$ | 1,00-13,50 mm |

# Ref. 8255

## PORTA-PLAQUITAS FRESADO ESCUADRA W90TP16D-90°
W90TP16D-90° Square Milling Tool-Holder
Porte-Plaquettes fraisage équerre W90TP16D-90°

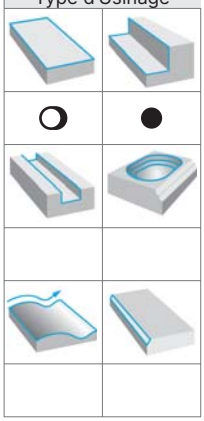



| | | | |
|---|---|---|---|
| $\gamma_p$ | +5° | $K_r$ | 90° |
| $\gamma_f$ | 0° | $a_{p\ max}$ | 13 mm |



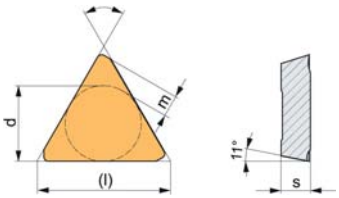

| ISO | D | dH7 | L | Z | N° Art. | € | Ref. 8804 | Ref. 8806 | Ref. 8809 | Ref. 8807 | Ref. 8804 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 050R-W90TP16D | 50 | 22 | 40 | 4 | 20698 | 242,55 | Z-116 Art. 21005 2,52 € (5) | 5 | - | - | Z-910 Art. 20998 4,56 € (5) |
| 063R-W90TP16D | 63 | 27 | 50 | 4 | 20708 | 297,35 | | | | | Z-912 Art. 20999 3,82 € (5) |
| 080R-W90TP16D | 80 | 32 | 50 | 5 | 20723 | 410,59 | Z-106 Art. 21004 2,52 € (5) | Z-206 Art. 21367 2,83 € | Z-316 Art. 21373 10,12 € (5) | Z-416 Art. 21371 1,31 € (5) | Z-916 Art. 21000 3,82 € (5) |
| 100R-W90TP16D | 100 | 40 | 50 | 6 | 20738 | 526,46 | | | | | Z-920 Art. 21002 12,67 € (5) |

**Tipo Mecanizado**
**Machining Type**
Type d'Usinage



**Plaquita** / Insert / Plaquette: **Pag. 634**

**TPKN-TPKR**




| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Arandela** - Clamp - Rondelle |
| | **Placa Base** - Base Plate - Plaque de base |
| | **Pasador** - Pin - Goupille |
| | **Tornillo** - Screw - Vis |

| ISO | Calidades / Qualities / Qualités C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | Dimensiones Dimensions l | d | s | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPKN 1603PDSR | | | | | ● | | | ● | ● | 16,5 | 9,53 | 3,18 | 2,45 |
| TPKR 1603PDSR | | | | | ● | | | ● | | 16,5 | 9,53 | 3,18 | 2,45 |

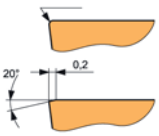
**Plaquita** / Insert / Plaquette: **Pag. 634**

**TPKN**

Geometría / Geometry / Géométrie

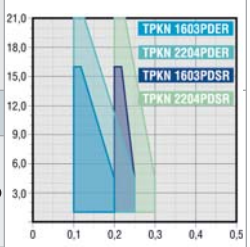
**Foto** Picture Photo

**Filo Corte** Cutting Edge Arête coupe




**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | ◎ | ○ | ● | | | ● |
| Desb. Medio Roug. & Finish. Semi-Finition | ◎ | ○ | ● | | | ● |
| Desb. Grueso Coarse Rough. Ébauche | | | | | | |




**Condiciones Corte** Cutting Conditions Conditions coupe

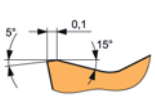
| | |
|---|---|
| $f_z$ | 0,08-0,20 mm/z |
| $a_p$ | 1,00-13,00 mm |

**TPKR**

Geometría / Geometry / Géométrie

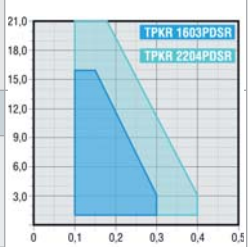
**Foto** Picture Photo

**Filo Corte** Cutting Edge Arête coupe




**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | ● | ◎ | ● | | | |
| Desb. Medio Roug. & Finish. Semi-Finition | ● | ◎ | ● | | | |
| Desb. Grueso Coarse Rough. Ébauche | | | | | | |

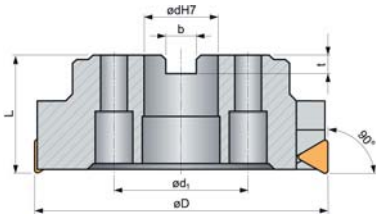



**Condiciones Corte** Cutting Conditions Conditions coupe

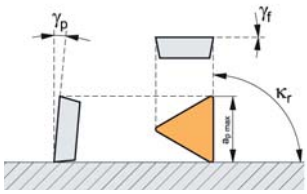
| | |
|---|---|
| $f_z$ | 0,08-0,20 mm/z |
| $a_p$ | 1,00-13,00 mm |

# Ref. 8260

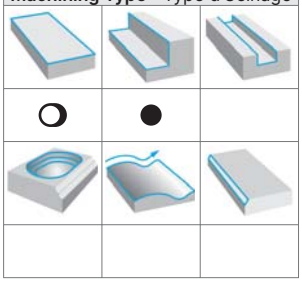
## PORTA-PLAQUITAS FRESADO ESCUADRA W90TP22D-90°
W90TP22D-90° Square Milling Tool-Holder
Porte-Plaquettes fraisage équerre W90TP22D-90°




| | | | |
|---|---|---|---|
| $\gamma_p$ | +5° | $K_r$ | 90° |
| $\gamma_f$ | 0° | $a_{p\ max}$ | 18 mm |




**Tipo Mecanizado**
**Machining Type** - Type d'Usinage

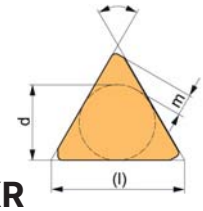


| ISO | D | dH7 | L | Z | N° Art. | € | Ref. 8804 | Ref. 8810 | Ref. 8810 | Ref. 8811 | Ref. 8804 | Ref. 8804 | Ref. 8801 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 5 | 5 | 5 | 5 | 5 | Z-912 Art. 20999 **3,82 €** 5 | 1 |
| **160R-W90TP22D** | 160 | 40 | 63 | 9 | 20743 | **1.402,74** | **Z-077** Art. 21374 **3,82 €** | **Z-434** Art. 21376 **10,12 €** | **Z-436** Art. 21390 **10,12 €** | **Z-942** Art. 21392 **36,25 €** | **Z-116** Art. 21005 **2,52 €** | **Z-916** Art. 21000 **3,82 €** 5 | **ZT-20** Art. 13845 **11,06 €** |
| | | | | | | | | | | | | - | |

**Ref. 8260 hasta fin de existencias** / while stock lasts / jusqu'à la fin de stock

**Plaquita** / Insert / Plaquette: **Pag. 634**

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Brida** - Clamp - Pince |
| | **Cuña** - Wedge - Cale |
| | **Tope** - Stop |
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |




## TPKN-TPKR

| ISO | Calidades / Qualities / Qualités C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | Dimensiones Dimensions l | d | s | m |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TPKN 2204PDSR** | | | ● | | ● | | | ● | ● | 22 | 12,70 | 4,76 | 3,55 |
| **TPKR 2204PDSR** | | | | | ● | | | ● | | 22 | 12,70 | 4,76 | 3,55 |

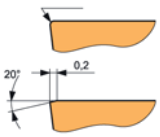
**Plaquita** / Insert / Plaquette: **Pag. 634**

**TPKN**

Geometría / Geometry / Géométrie

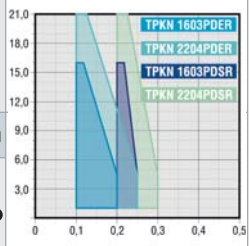
**Foto** Picture Photo

**Filo Corte** Cutting Edge Arête coupe




**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| | Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|---|
| Acabado | Finishing Finition | ○ | ○ | ● | | | ● |
| Desb. Medio | Roug. & Finish. Semi-Finition | ○ | ○ | ● | | | ● |
| Desb. Grueso | Coarse Rough. Ébauche | | | | | | |




**Condiciones Corte** Cutting Conditions Conditions coupe

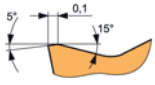
| | |
|---|---|
| $f_z$ | 0,10-0,30 mm/z |
| $a_p$ | 1,00-18,00 mm |

**TPKR**

Geometría / Geometry / Géométrie

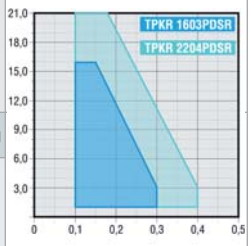
**Foto** Picture Photo

**Filo Corte** Cutting Edge Arête coupe




**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| | Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|---|
| Acabado | Finishing Finition | ● | ● | ● | | | |
| Desb. Medio | Roug. & Finish. Semi-Finition | ● | ● | ● | | | |
| Desb. Grueso | Coarse Rough. Ébauche | | | | | | |




**Condiciones Corte** Cutting Conditions Conditions coupe

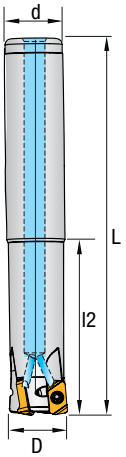
| | |
|---|---|
| $f_z$ | 0,10-0,30 mm/z |
| $a_p$ | 1,00-18,00 mm |

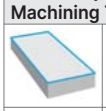
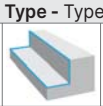
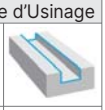
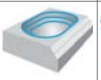
# Ref. 8261

## PORTA-PLAQUITAS FRESADO ALTO AVANCE SLO-03 REFRIGERACIÓN INTERIOR
## Internal Cooling SLO-03 High Feed Tool-Holder
## Porte-Plaquettes Fraisage haute avance SLO-03 lubrification interne

New!

ALTO AVANCE
High Feed
Haute avance



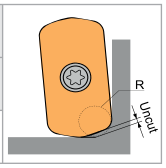

| Tipo Mecanizado<br>Machining Type - Type d'Usinage | | |
|---|---|---|
|  |  |  |
| ● | | |
|  | | |
| ● | | |

| ISO | D | dH6 | L | l2 | Z | N° Art. | € | Ref. 8804 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **20-SLO-03** | 20 | 20 | 150 | 60 | 3 | 44837 | **169,21** | **M3×7**<br>Art. 70192<br>**3,42 €** | 5 | **ZT-8**<br>Art. 10506<br>**11,06 €** | 1 |
| **25-SLO-03** | 25 | 25 | 150 | 60 | 4 | 44930 | **186,13** | | | | |

**Plaquita** / Insert / Plaquette:
**Pag. 628**

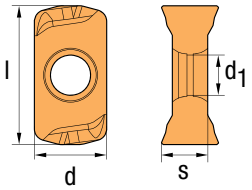
| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

**Programación del radio de esquina**
Programming of the corner radius
Programmation du rayon de coin

| Descripción<br>Designation<br>Description | Approx. R (mm) | |  |
|---|---|---|---|
| | Input R | Uncut | |
| **LOGX-030310** | 1,6 | 0,39 | |



| Condiciones Corte<br>Cutting Conditions<br>Conditions coupe | |
|---|---|
| f<br>mm | $a_p$<br>mm |
| 0,30-1,60 | 0,30-0,90 |




## LOGX

| | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones<br>Dimensions | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ISO | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | l | d | s | $d_1$ |
| **LOGX-030310-ZSG** | | | | | | | ● | ● | | 11,90 | 6,20 | 3,96 | 3,45 |

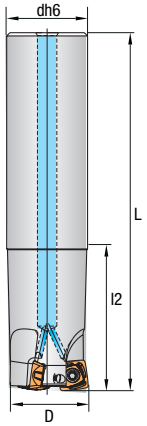
**Plaquita** / Insert / Plaquette:
**Pag. 628**

# Ref. 8262

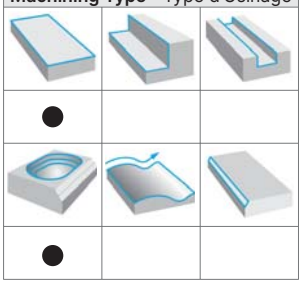
## PORTA-PLAQUITAS FRESADO ALTO AVANCE SSD-12 REFRIGERACIÓN INTERIOR
Internal Cooling SSD-12 High Feed Tool-Holder
Porte-Plaquettes Fraisage haute avance SSD-12 lubrification interne

New!

ALTO AVANCE
High Feed
Haute avance




**Tipo Mecanizado**
**Machining Type** - Type d'Usinage



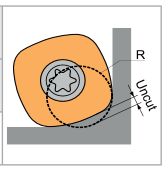
| ISO | D | dh6 | L | l2 | Z | N° Art. | € | Ref. 8804 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **32-SSD-12** | 32 | 32 | 160 | 70 | 2 | 77795 | **207,63** | **M4×8** Art. 77794 **3,42 €** | 5 | **ZT-15** Art. 10512 **11,06 €** | 1 |
| **40-SSD-12** | 40 | 32 | 200 | 70 | 3 | 77796 | **264,45** | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 630**

**Tornillo** - Screw - Vis
**Destornillador** - Screwdriver - Tournevis

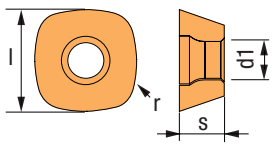
**Programación del radio de esquina**
Programming of the corner radius
Programmation du rayon de coin

| Descripción Designation Description | Approx. R (mm) | |
|---|---|---|
| | Input R | Uncut |
| **SDMT1205** | 4,5 | 0,83 |




**Condiciones Corte**
Cutting Conditions
Conditions coupe

| f mm | $a_p$ mm |
|---|---|
| 0,50-1,80 | 0,30-1,50 |




## SDMT

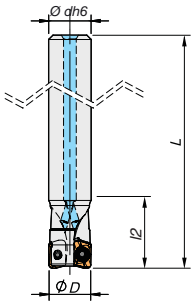
| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones Dimensions | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | l | s | r | $d_1$ |
| **SDMT-1205ZDTN-ZMG** | | | | | ● | | ● | | | 12,7 | 5,56 | 15 | 4,60 |

**Plaquita** / Insert / Plaquette: **Pag. 630**

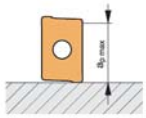
# Ref. 8264

## PORTA-PLAQUITAS FRESADO ESCUADRA SAP-06
SAP-06 Square Milling Tool-Holder
Porte-Plaquettes fraisage équerre SAP-06

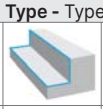
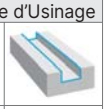
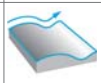
EXCLUSIVO Exclusive Exclusif — IZAR CUTTING TOOLS




| | | | |
|---|---|---|---|
| $\gamma_p$ | | $K_r$ | |
| $\gamma_f$ | | $a_{p\ max}$ | 4 mm |



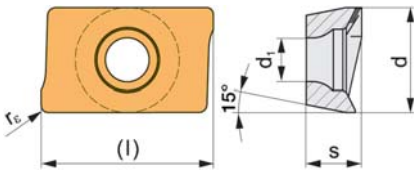
**Tipo Mecanizado**
**Machining Type** - Type d'Usinage

| | | |
|---|---|---|
| |  |  |
| ● | ● | ● |
| |  | |
| ● | | |

| ISO | dh6 | D | L | $l_2$ | Z | N° Art. | € | Ref. 8804 |
|---|---|---|---|---|---|---|---|---|
| **10-SAP-06** | 10 | 10 | 55 | 16 | 2 | 19833 | **265,50** | **P-180300** Art. 30435 **11,10 €** — 5 |
| **12-SAP-06** | 12 | 12 | 80 | 17 | 2 | 19835 | **265,50** | |
| **16-SAP-06** | 16 | 16 | 90 | 20 | 3 | 20028 | **303,41** | **P-180400** Art. 30437 **11,10 €** — 5 |

**Plaquita** / Insert / Plaquette: **Pag. 635**

**Tornillo** - Screw - Vis



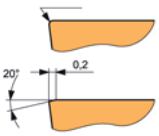

## XOET

| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones Dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | l | d | s | $d_1$ | r |
| **XOET-060204** | | | | | ● | | | | | 6,96 | 3,98 | 2,30 | 1,92 | 0,4 |
| **XOET-060208** | | | | | ● | | | | | 6,96 | 3,98 | 2,30 | 1,92 | 0,8 |

**Plaquita** / Insert / Plaquette: **Pag. 635**

| Geometría Geometry Géométrie | Foto Picture Photo | Grupo Materiales Pieza Trabajo Workpiece Material Group Groupe matériaux pièce travail | P | M | K | S | N | H |
|---|---|---|---|---|---|---|---|---|
| XOET | | Fresado Milling Fraisage | | | | | | |
| | | Acabado Finishing Finition | ● | ● | ● | ● | | |
| | | Desb. Medio Roug. & Finish. Semi-Finition | ● | ● | ● | ● | | |
| | | Desb. Grueso Coarse Rough. Ebauche | ● | ● | ● | ● | | |

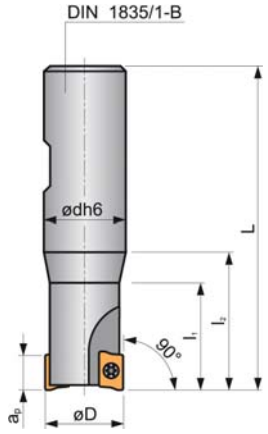
**Filo Corte**
Cutting Edge
Arête coupe



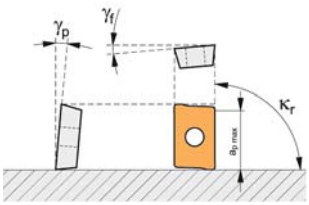

| Condiciones Corte Cutting Conditions Conditions coupe | |
|---|---|
| $f_z$ | 0,05-0,07 mm/z |
| $a_p$ | 1-4 mm |

# Ref. 8265

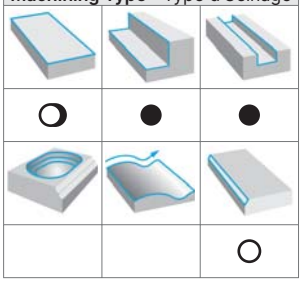
## PORTA-PLAQUITAS FRESADO ESCUADRA SAP-10D
SAP-10D Square Milling Tool-Holder
Porte-Plaquettes fraisage équerre SAP-10D




| | | | |
|---|---|---|---|
| $\gamma_p$ | +4-10° | $K_r$ | 90° |
| $\gamma_f$ | 12° | $a_{p\,max}$ | 9 mm |



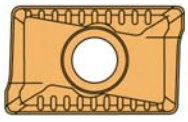

**Tipo Mecanizado**
**Machining Type** - Type d'Usinage

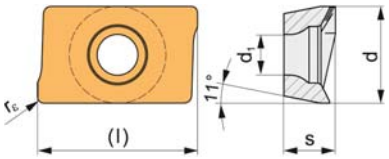


| ISO | dh6 | D | L | $l_2$ | Z | N° Art. | € | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | T-0 Art. 10846 3,20 € | 5 | ZT-07 Art. 19569 11,06 € | 1 |
| **16-SAP-10D** | 20 | 16 | 90 | 25 | 2 | 20746 | **157,78** | | | | |
| **20-SAP-10D** | 20 | 20 | 95 | 30 | 3 | 20750 | **180,68** | | | | |
| **25-SAP-10D** | 25 | 25 | 95 | 30 | 4 | 20752 | **204,76** | | | | |

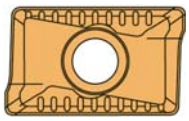
**Plaquita** / Insert / Plaquette: **Pag. 626**

**Tornillo** - Screw - Vis
**Destornillador** - Screwdriver - Tournevis

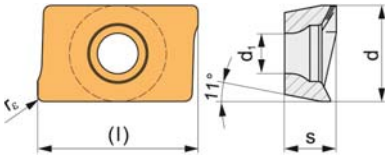





## APKT



## APET FA
Al



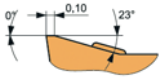

| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones Dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | l | d | s | $d_1$ | $r_\epsilon$ |
| **APKT-1003PDER-M** | ● | | | | ● | | ● | ● | | 10 | 6,7 | 3,50 | 2,88 | 0,5 |
| **APET 1003PDFR-FA** | | | | | | | | | ● | 10 | 6,7 | 3,50 | 2,88 | 0,5 |

**Plaquita** / Insert / Plaquette: **Pag. 626**

**Geometría** Geometry Géométrie — **APKT-10..**

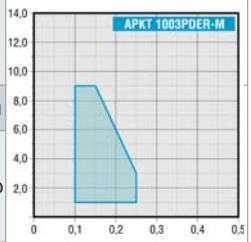
**Foto** Picture Photo

**Filo Corte** Cutting Edge Arête coupe




**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | ● | ● | ● | | | ○ |
| Desb. Medio Roug. & Finish. Semi-Finition | ● | ● | ● | | | ○ |
| Desb. Grueso Coarse Rough. Ébauche | ○ | ○ | ○ | ○ | | |



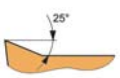

**Condiciones Corte** Cutting Conditions Conditions coupe

| | |
|---|---|
| $f_z$ | 0,10-0,25 mm/z |
| $a_p$ | 1,00-9,00 mm |

**Geometría** Geometry Géométrie — **APET FA**

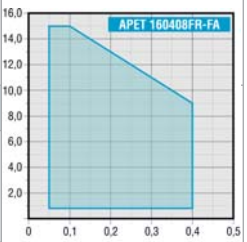
**Foto** Picture Photo

**Filo Corte** Cutting Edge Arête coupe




**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | | | | | ● | |
| Desb. Medio Roug. & Finish. Semi-Finition | | | | | ● | |
| Desb. Grueso Coarse Rough. Ébauche | | | | | ● | |

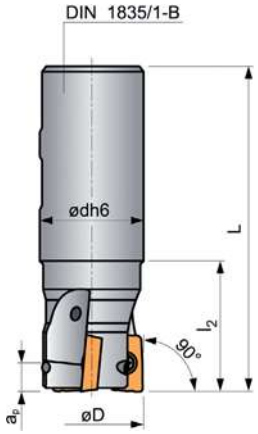



**Condiciones Corte** Cutting Conditions Conditions coupe

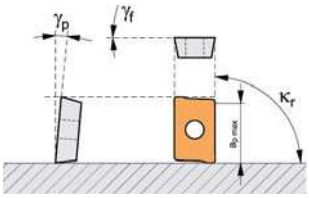
| | |
|---|---|
| $f_z$ | 0,05-0,40 mm/z |
| $a_p$ | 0,80-15,00 mm |

# Ref. 8270

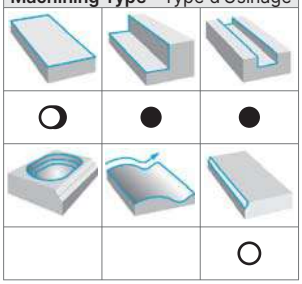
## PORTA-PLAQUITAS FRESADO ESCUADRA SAP-16D
SAP-16D Square Milling Tool-Holder
Porte-Plaquettes fraisage équerre SAP-16D




| | | | |
|---|---|---|---|
| $\gamma_p$ | +0-8° | $K_r$ | 90° |
| $\gamma_f$ | 0° | $a_{p\,max}$ | 13,50 mm |



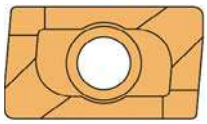

**Tipo Mecanizado**
**Machining Type** - Type d'Usinage

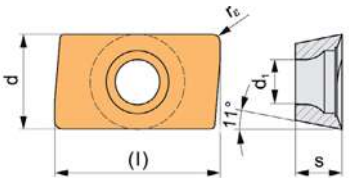


| ISO | dh6 | D | L | $l_2$ | Z | N° Art. | € | Ref. 8816 | | Ref. 8801 |
|---|---|---|---|---|---|---|---|---|---|---|
| **25-SAP-16D** | 25 | 25 | 100 | 30 | 2 | 20759 | **204,75** | **T 15** Art. 35217 **3,42 €** | 5 | **ZT-15** Art. 10512 **11,06 €** 1 |
| **32-SAP-16D** | 32 | 32 | 110 | 35 | 3 | 20762 | **216,79** | **T-15** Art. 10895 **3,42 €** | 5 | |
| **40-SAP-16D** | 32 | 40 | 110 | 35 | 4 | 20789 | **234,87** | | | |

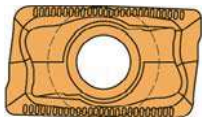
**Tornillo** - Screw - Vis
**Destornillador** Screwdriver Tournevis

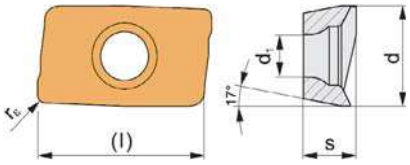
**Plaquita** / Insert / Plaquette: **Pag. 626, 627**






## APHT






## APKT

| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones Dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | l | d | s | $d_1$ | $r_\epsilon$ |
| **APHT-160408PDFR-FA** | | | | | | | | | ● | 16 | 9,45 | 5,35 | 4,5 | 0,8 |
| **APKT-1604PDER** | ● | | | | ● | | ● | ● | | 16 | 9,45 | 5,35 | 4,6 | 0,8 |

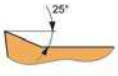
**Plaquita** / Insert / Plaquette: **Pag. 626, 627**

### APHT

**Geometría** Geometry Géométrie

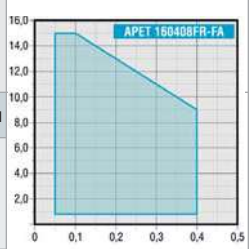
**Foto** Picture Photo

**Filo Corte** Cutting Edge Arête coupe




**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | | | | | ● | |
| Desb. Medio Roug. & Finish. Semi-Finition | | | | | ● | |
| Desb. Grueso Coarse Rough. Ébauche | | | | | ● | |




**Condiciones Corte** Cutting Conditions Conditions coupe

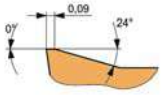
| | |
|---|---|
| $f_z$ | 0,07-0,20 mm/z |
| $a_p$ | 1,00-13,50 mm |

### APKT-PDER

**Geometría** Geometry Géométrie

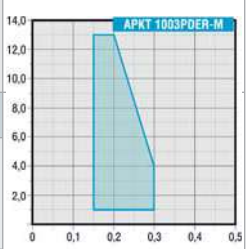
**Foto** Picture Photo

**Filo Corte** Cutting Edge Arête coupe




**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | ● | ● | ● | ○ | | |
| Desb. Medio Roug. & Finish. Semi-Finition | ● | ● | ● | ○ | | |
| Desb. Grueso Coarse Rough. Ébauche | ○ | ○ | ○ | ○ | | |

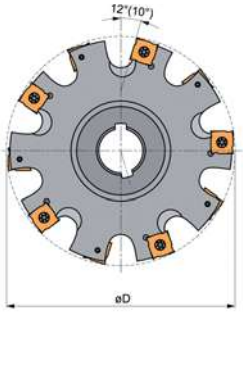



**Condiciones Corte** Cutting Conditions Conditions coupe

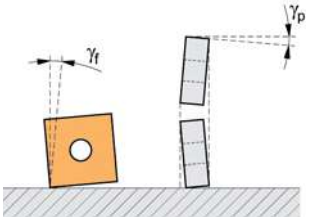
| | |
|---|---|
| $f_z$ | 0,07-0,15 mm/z |
| $a_p$ | 1,00-13,50 mm |

# Ref. 8275

## PORTA-PLAQUITAS RANURADO S90SN12
S90SN12 Side & Face Milling Tool-Holder
Porte-Plaquettes rainurage S90SN12

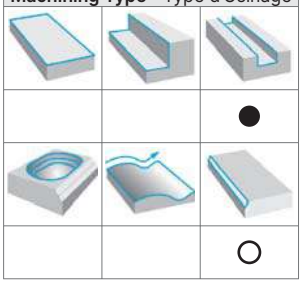



| | | | |
|---|---|---|---|
| $\gamma_p$ | -0°30´ | $K_r$ | 90° |
| $\gamma_f$ | +2°30´ | $a_{p\ max}$ | H |



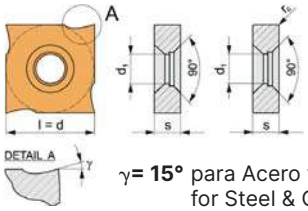

| ISO | D | dH7 | H | s | $d_1$ | Z | Plaquita Insert Plaquette | N° Art. | € | Ref. 8804 | Ref. 8801 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **S90-100-06** | 100 | 27 | 25 | 6 | 41 | 10 | SNH.-1203.. | 20840 | **897,07** | **Z-745** Art. 21315 **3,61 €** (5) | **ZT-15** Art. 10512 **11,06 €** (1) |
| **S90-125-06** | 125 | 32 | 40 | 6 | 48 | 12 | SNH.-1203.. | 20869 | **1.020,67** | | |
| **S90-160-06** | 160 | 40 | 44 | 6 | 58 | 16 | SNH.-1203.. | 20873 | **1.216,51** | | |
| **S90-100-08** | 100 | 27 | 25 | 8 | 41 | 10 | SNH.-1204.. | 20855 | **897,07** | **Z-846** Art. 21364 **3,61 €** (5) | |
| **S90-125-08** | 125 | 32 | 40 | 8 | 48 | 12 | SNH.-1204.. | 20870 | **1.020,67** | | |
| **S90-160-08** | 160 | 40 | 44 | 8 | 58 | 16 | SNH.-1204.. | 20874 | **1.216,51** | | |
| **S90-100-10** | 100 | 27 | 25 | 10 | 41 | 10 | SNH.-1205.. | 20858 | **897,07** | **Z-845** Art. 21349 **3,61 €** (5) | |
| **S90-125-10** | 125 | 32 | 40 | 10 | 48 | 12 | SNH.-1205.. | 20871 | **1.020,67** | | |
| **S90-160-10** | 160 | 40 | 44 | 10 | 58 | 16 | SNH.-1205.. | 20876 | **1.216,51** | | |
| **S90-100-12** | 100 | 27 | 25 | 12 | 41 | 10 | SNH.-1207.. | 20867 | **897,07** | **Z-847** Art. 21365 **4,05 €** (5) | |
| **S90-125-12** | 125 | 32 | 40 | 12 | 48 | 12 | SNH.-1207.. | 20872 | **1.020,67** | | |
| **S90-160-12** | 160 | 40 | 44 | 12 | 58 | 16 | SNH.-1207.. | 20877 | **1.216,51** | | |

**Tipo Mecanizado**
**Machining Type** - Type d'Usinage



| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Destornillador** Screwdriver Tournevis |

**Plaquita** / Insert / Plaquette: **Plaquette: Pag. 632**




## SNHQ

**γ= 15°** para Acero y Fundición
for Steel & Cast Iron
Pour acier et fonte

| | Calidades Qualities Qualités | Dimensiones Dimensions | | |
|---|---|---|---|---|
| **ISO** | **P-640** | **l** | **s** | **$d_1$** |
| **SNHQ 1203AZTN** | ● | 12,70 | 3,20 | 5 |
| **SNHQ 1204AZTN** | ● | 12,70 | 4,50 | 5 |
| **SNHQ 1205AZTN** | ● | 12,70 | 5,40 | 5 |
| **SNHQ 1207AZTN** | ● | 12,70 | 7,00 | 5 |

**Plaquita** / Insert / Plaquette: **Pag. 632**

**Geometría** Geometry Géométrie

**SNHQ**

**Filo Corte**
Cutting Edge
Arête coupe

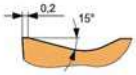
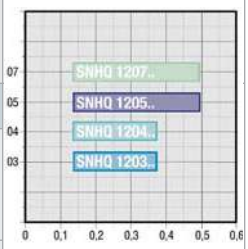



**Foto**
Picture
Photo

**Grupo Materiales Pieza Trabajo**
Workpiece Material Group
Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| **Acabado** Finishing Finition | ● | ● | ● | ● | ○ | ○ |
| **Desb. Medio** Roug. & Finish. Semi-Finition | ● | ● | ● | ● | ○ | ○ |
| **Desb. Grueso** Coarse Rough. Ébauche | ● | ● | ● | ● | ○ | ○ |

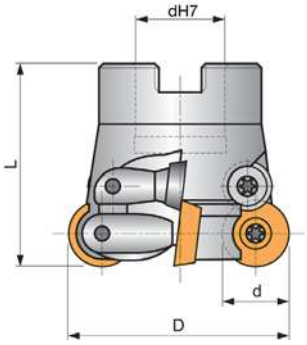



**Condiciones Corte**
Cutting Conditions
Conditions coupe

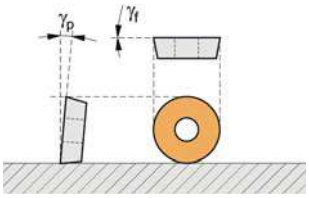
| | |
|---|---|
| $f_z$ | 0,20-0,50 mm/z |

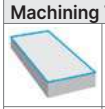
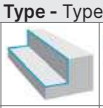
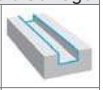
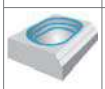
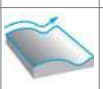
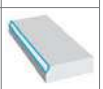
# Ref. 8280

## PORTA-PLAQUITAS PERFILADO SCMORD
SCMORD Profile Tool-Holder
Porte-Plaquettes profilage SCMORD




| | | | |
|---|---|---|---|
| $\gamma_p$ | +5° | $a_{p\ max}$ | 2,50 mm |
| $\gamma_f$ | 0° | | 3,50 mm |



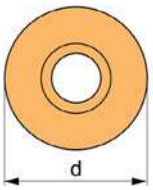

| Tipo Mecanizado Machining Type - Type d'Usinage | | |
|---|---|---|
|  |  |  |
| ● | | |
|  |  |  |
| ● | ● | |

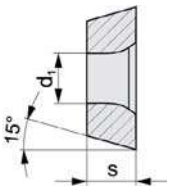
| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Arandela** - Clamp - Rondelle |
| | **Destornillador** - Screwdriver Tournevis |

| ISO | D | d | dH7 | L | Z | Plaquita Insert - Plaquette | Nº Art. | € | Ref. 8804 | | Ref. 8806 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **52-SCMORD-12** | 52 | 12 | 22 | 50 | 5 | RD..12T3 | 20883 | **305,40** | **Z-235** Art. 21011 **3,82 €** | 5 | **Z-209** Art. 21368 **2,83 €** | 5 | **ZT-15** Art. 10512 **11,06 €** | 1 |
| **66-SCMORD-12** | 66 | 12 | 27 | 50 | 6 | RD..12T3 | 20885 | **394,43** | | | | | | |
| **80-SCMORD-12** | 80 | 12 | 27 | 50 | 7 | RD..12T3 | 20886 | **558,60** | | | | | | |
| **52-SCMORD-16** | 52 | 16 | 22 | 50 | 4 | RD..1604 | 20887 | **305,40** | **Z-245** Art. 21013 **3,41 €** | 5 | **Z-210** Art. 21369 **2,83 €** | 5 | **ZT-20** Art. 13845 **11,06 €** | 1 |
| **66-SCMORD-16** | 66 | 16 | 27 | 50 | 5 | RD..1604 | 20891 | **394,43** | | | | | | |
| **80-SCMORD-16** | 80 | 16 | 27 | 50 | 6 | RD..1604 | 20892 | **558,60** | | | | | | |

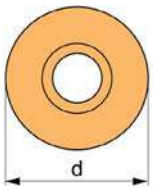
**Plaquita** / Insert / Plaquette: **Pag. 629**

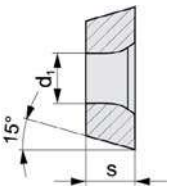
**RDHW**



**RDHT**




| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones Dimensions | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | D | $d_1$ | s |
| **RDHW 12T3MOT** | | | ● | | ● | | | | | 12,00 | 3,90 | 3,97 |
| **RDHT 12T3MOT** | | | ● | | ● | | | | | 12,00 | 3,90 | 3,97 |
| **RDHW 1604MOT** | | | ● | | ● | | | | | 16,00 | 5,20 | 4,76 |
| **RDHT 1604MOT** | | | ● | | ● | | | | | 16,00 | 5,20 | 4,76 |

**Plaquita** / Insert / Plaquette: **Pag. 629**

**RDHW**

Geometría / Geometry / Géométrie

**Filo Corte** Cutting Edge Arête coupe

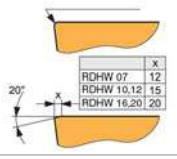
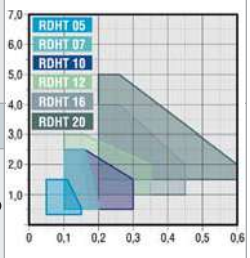



**Foto** Picture Photo

**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | ○ | ○ | ● | | | ● |
| Desb. Medio Roug. & Finish. Semi-Finition | ○ | ○ | ● | | | ● |
| Desb. Grueso Coarse Rough. Ébauche | ○ | ○ | ● | | | ● |




**Condiciones Corte** Cutting Conditions Conditions coupe

| | |
|---|---|
| $f_z$ | 0,10-0,27 mm/z |
| $a_p$ | **Segun Dimensiones plaquita** According to insert dimensions Suivant dimensions plaquette |

**RDHT**

Geometría / Geometry / Géométrie

**Filo Corte** Cutting Edge Arête coupe

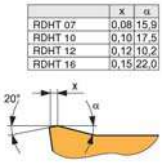
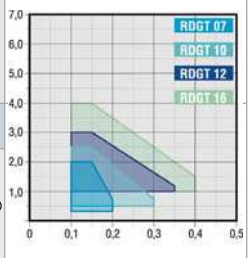



**Foto** Picture Photo

**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| Acabado Finishing Finition | ● | ● | ○ | ○ | | ○ |
| Desb. Medio Roug. & Finish. Semi-Finition | ● | ● | ○ | ○ | | ○ |
| Desb. Grueso Coarse Rough. Ébauche | ● | ● | ○ | ○ | | ○ |

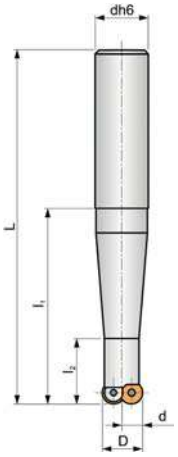



**Condiciones Corte** Cutting Conditions Conditions coupe

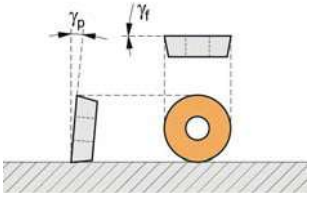
| | |
|---|---|
| $f_z$ | 0,10-0,27 mm/z |
| $a_p$ | **Segun Dimensiones plaquita** According to insert dimensions Suivant dimensions plaquette |

# Ref. 8285

## PORTA-PLAQUITAS PERFILADO SRD
SRD Profile Tool-Holder
Porte-Plaquettes profilage SRD

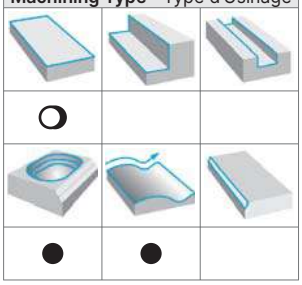



| | | | |
|---|---|---|---|
| $\gamma_p$ | +5° | $a_{p\ max}$ | 1,50 mm |
| $\gamma_f$ | 0° | | 2,50 mm |




| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Arandela** - Clamp - Rondelle |
| | **Destornillador** - Screwdriver<br>Tournevis |

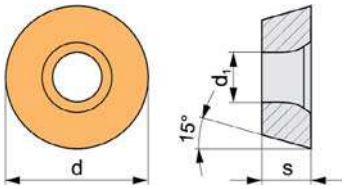
**Tipo Mecanizado**
**Machining Type** - Type d'Usinage



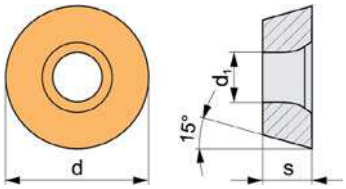
| ISO | D | dh6 | L | $l_2$ | Z | Plaquita<br>**Insert** - Plaquette | N° Art. | € | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | **Ref. 8801** |
| **15-SRD-07** | 15 | 20 | 100 | 40 | 2 | RD..0702 | 20894 | **221,09** | **T-07**<br>**Ref. 8816** - Art. 10846<br>**3,20 €** | 5 | **ZT-07**<br>Art. 19569<br>**11,06 €** | 1 |
| **15-SRD-07** | 15 | 20 | 150 | 40 | 2 | RD..0702 | 20896 | **276,04** | | | | |
| **20-SRD-10** | 20 | 20 | 100 | 40 | 2 | RD..1003 | 20901 | **221,09** | **Z-435**<br>**Ref. 8804** - Art. 21058<br>**3,82 €** | 5 | | |
| **20-SRD-10** | 20 | 20 | 150 | 40 | 2 | RD..1003 | 20906 | **276,04** | | | | |

**Plaquita** / Insert / Plaquette: **Pag. 629**

**RDHW**



**RDHT**




| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones<br>Dimensions | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | D | $d_1$ | s |
| **RDHW 0702MOT** | | | ● | | ● | | | | | 7,00 | 2,80 | 2,38 |
| **RDHT 0702MOT** | | | ● | | ● | | | | | 7,00 | 3,90 | 2,38 |
| **RDHW 1003MOT** | | | ● | | ● | | | | | 10,00 | 2,80 | 2,38 |
| **RDHT 1003MOT** | | | ● | | ● | | | | | 10,00 | 3,90 | 3,18 |

**Plaquita** / Insert / Plaquette: **Pag. 629**

**RDHW**

Geometría / Geometry / Géométrie

**Filo Corte**
Cutting Edge
Arête coupe

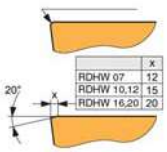
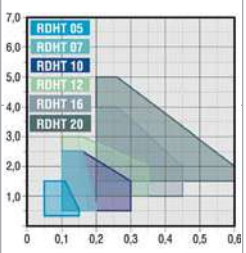



**Foto**
Picture
Photo

**Grupo Materiales Pieza Trabajo**
Workpiece Material Group
Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| **Acabado** Finishing Finition | ○ | ○ | ● | | | ● |
| **Desb. Medio** Roug. & Finish. Semi-Finition | ○ | ○ | ● | | | ● |
| **Desb. Grueso** Coarse Rough. Ébauche | ○ | ○ | ● | | | ● |




**Condiciones Corte**
Cutting Conditions
Conditions coupe

| | |
|---|---|
| $f_z$ | 0,10-0,24 mm/z |
| $a_p$ | **Segun Dimensiones plaquita**<br>According to insert dimensions<br>Suivant dimensions plaquette |

**RDHT**

Geometría / Geometry / Géométrie

Filo Corte
Cutting Edge
Arête Coupe

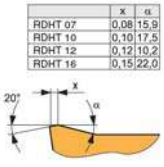
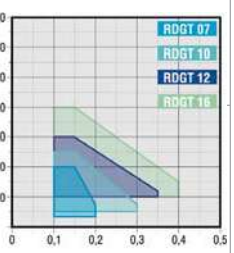



**Foto**
Picture
Photo

**Grupo Materiales Pieza Trabajo**
Workpiece Material Group
Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| **Acabado** Finishing Finition | ● | ● | ● | ● | | ○ |
| **Desb. Medio** Roug. & Finish. Semi-Finition | ● | ● | ● | ● | | ○ |
| **Desb. Grueso** Coarse Rough. Ébauche | ● | ● | ● | ● | | ○ |



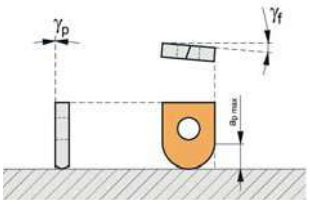

**Condiciones Corte**
Cutting Conditions
Conditions coupe

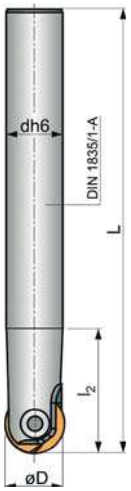
| | |
|---|---|
| $f_z$ | 0,10-0,24 mm/z |
| $a_p$ | **Segun Dimensiones plaquita**<br>According to insert dimensions<br>Suivant dimensions plaquette |

# Ref. 8290

## PORTA-PLAQUITAS COPIADO SRC
SRC Copy Tool-Holder
Porte-Plaquettes copiage SRC

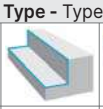
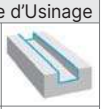
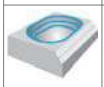
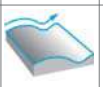
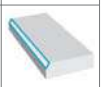
| | | | |
|---|---|---|---|
| $\gamma_p$ | 0° | $a_{p\ max}$ | 2-6 mm |
| $\gamma_f$ | -7-14° | | |



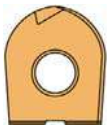

| ISO | D | L | $l_2$ | dh6 | Plaquita Insert - Plaquette | N° Art. | € | Ref. 8804 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SRC-10** | 10 | 105 | 35 | 12 | RC10 | 20910 | **202,34** | **Z-359** Art. 21016 **14,23 €** | 5 | **ZT-15** Art. 10512 **11,06 €** | 1 |
| **SRC-10** | 10 | 150 | 50 | 12 | RC10 | 20911 | **216,79** | | | | |
| **SRC-12** | 12 | 105 | 35 | 16 | RC12 | 20913 | **202,34** | **Z-509** Art. 21155 **14,23 €** | 5 | | 1 |
| **SRC-12** | 12 | 160 | 50 | 16 | RC12 | 20914 | **216,79** | | | | |
| **SRC-16** | 16 | 105 | 45 | 20 | RC16 | 20916 | **202,34** | **Z-519** Art. 21156 **14,23 €** | 5 | **ZT-20** Art. 13845 **11,06 €** | |
| **SRC-16** | 16 | 180 | 70 | 20 | RC16 | 20918 | **216,79** | | | | |
| **SRC-20** | 20 | 125 | 50 | 25 | RC20 | 20919 | **216,79** | **Z-529** Art. 21229 **14,23 €** | 5 | | |
| **SRC-20** | 20 | 200 | 70 | 25 | RC20 | 20920 | **264,99** | | | | |
| **SRC-25** | 25 | 125 | 55 | 32 | RC25 | 20921 | **264,99** | **Z-609** Art. 21230 **16,43 €** | 5 | **ZT-30** Art. 21588 **22,69 €** | 1 |
| **SRC-25** | 25 | 220 | 100 | 32 | RC25 | 20923 | **301,10** | | | | |

**Tipo Mecanizado**
**Machining Type** - Type d'Usinage

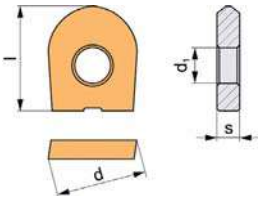
| | | |
|---|---|---|
| |  |  |
| ○ | | |
|  |  |  |
| ● | ● | |

**Plaquita** / Insert / Plaquette: **Pag. 629**

**Tornillo** - Screw - Vis
**Destornillador** - Screwdriver - Tournevis



**RC**



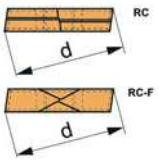

| ISO | Calidades Qualities Qualités P-615 | P-640 | Dimensiones Dimensions D | l | $d_1$ | s |
|---|---|---|---|---|---|---|
| **RC-10** | ● | ● | 10,00 | 11,50 | 4,00 | 2,50 |
| **RC-12** | ● | ● | 12,00 | 12,00 | 5,00 | 2,50 |
| **RC-16** | ● | ● | 16,00 | 14,00 | 5,00 | 3,00 |
| **RC-20** | ● | ● | 20,00 | 16,00 | 5,00 | 3,00 |
| **RC-25** | ● | ● | 25,00 | 21,50 | 6,00 | 4,00 |

**Plaquita** / Insert / Plaquette: **Pag. 629**

**Geometría** Geometry Géométrie: **RC**

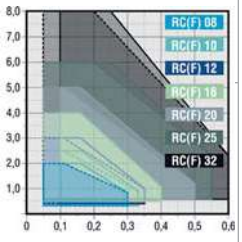
**Foto** Picture Photo

**Filo Corte** Cutting Edge Arête coupe




**Grupo Materiales Pieza Trabajo** Workpiece Material Group Groupe matériaux pièce travail

| Fresado Milling Fraisage | P | M | K | S | N | H |
|---|---|---|---|---|---|---|
| **Acabado** Finishing Finition | ● | | ● | | | ● |
| **Desb. Medio** Roug. & Finish. Semi-Finition | ● | | ● | | | ○ |
| **Desb. Grueso** Coarse Rough. Ébauche | ◉ | | ◉ | | | ○ |



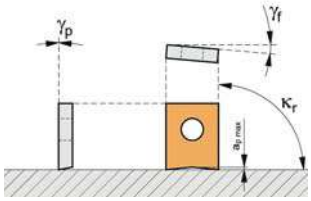

**Condiciones Corte** Cutting Conditions Conditions coupe

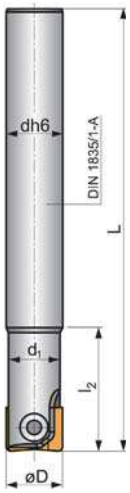
| | |
|---|---|
| $f_z$ | **Segun Dimensiones plaquita** According to insert dimensions Suivant dimensions plaquette |
| $a_p$ | |

# Ref. 8295

## PORTA-PLAQUITAS COPIADO SLC
SLC Copy Tool-Holder
Porte-Plaquettes copiage SLC

| | | | |
|---|---|---|---|
| $\gamma_p$ | 0° | $K_r$ | 90° |
| $\gamma_f$ | -7-14° | $a_{p\ max}$ | 0,6-1,6mm |



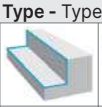
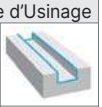
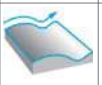



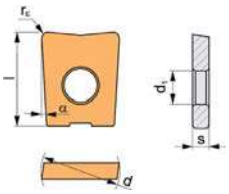

| ISO | D | dh6 | $d_1$ | L | $l_2$ | Plaquita Insert - Plaquette | N° Art. | € | Ref. 8804 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SLC-12** | 12 | 12 | 10 | 130 | 30 | LCK12 | 20924 | **249,56** | **Z-354** Art. 21015 **9,61 €** | 5 | **ZT-20** Art. 13845 **11,06 €** | 1 |
| **SLC-16** | 16 | 16 | 14 | 140 | 35 | LCK16 | 20925 | **262,59** | **Z-619** Art. 21295 **9,61 €** | 5 | | |
| **SLC-20** | 20 | 20 | 18 | 160 | 45 | LCK20 | 20926 | **302,75** | **Z-629** Art. 21298 **9,61 €** | 5 | | |

**Plaquita** / Insert / Plaquette: **Pag. 627**

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |

**Tipo Mecanizado**
**Machining Type** - Type d'Usinage

| | | |
|---|---|---|
| |  |  |
| ○ | ◑ | ○ |
| |  | |
| ● | ● | |



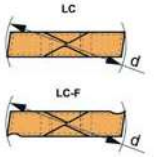

**LC**

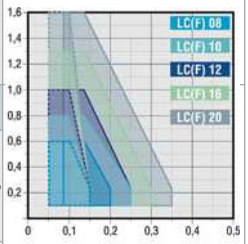
| ISO | Calidades Qualities Qualités P-615 | Dimensiones Dimensions d | l | $d_1$ | s | r |
|---|---|---|---|---|---|---|
| **LC-1210** | ● | 12,00 | 14,00 | 5,00 | 2,50 | 1,00 |
| **LC-1610** | ● | 16,00 | 16,00 | 5,00 | 3,00 | 1,00 |
| **LC-2010** | ● | 20,00 | 18,00 | 5,00 | 3,00 | 1,00 |

**Plaquita** / Insert / Plaquette: **Pag. 627**

| Geometría Geometry Géométrie | Foto Picture Photo | Grupo Materiales Pieza Trabajo Workpiece Material Group Groupe matériaux pièce travail | P | M | K | S | N | H |
|---|---|---|---|---|---|---|---|---|
| LC | | Fresado Milling Fraisage | | | | | | |
| | | Acabado Finishing Finition | ● | | ● | | | ○ |
| | | Desb. Medio Roug. & Finish. Semi-Finition | ○ | | ○ | | | ○ |
| | | Desb. Grueso Coarse Rough. Ébauche | ○ | | ○ | | | ○ |

**Filo Corte**
Cutting Edge
Arête coupe



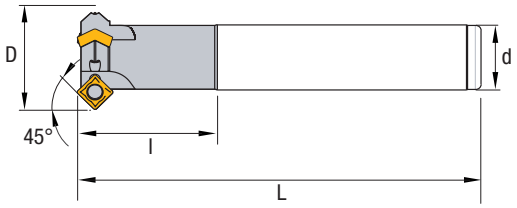

**Condiciones Corte**
Cutting Conditions
Conditions coupe

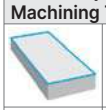
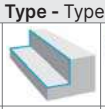
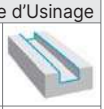
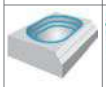
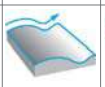
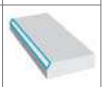
| | |
|---|---|
| $f_z$ | **Segun Dimensiones plaquita** According to insert dimensions Suivant dimensions plaquette |
| $a_p$ | |

# Ref. 8296

## PORTA-PLAQUITAS DE ACHAFLANADO CHS.. A 45º
45º CHS.. Chamfering Tool-Holder
Porte-Plaquettes chanfreinage CHS.. 45º

New!

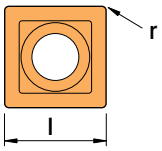


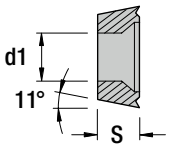

| Tipo Mecanizado<br>Machining Type - Type d'Usinage | | |
|---|---|---|
|  |  |  |
| | | |
|  |  |  |
| | | ● |

| ISO | D | d | L | l | Z | Nº Art. | € | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 25M-32CHSP09 | 32 | 25 | 150 | 30 | 2 | 26647 | 159,15 | M3,5X8,5<br>Art. 70740<br>3,42 € | 5 | ZT-15<br>Art. 10512<br>11,06 € | 1 |
| 25M-40CHSP09 | 40 | 25 | 150 | 50 | 3 | 77477 | 168,37 | | | | |

**Plaquita** / Insert / Plaquette:
**Pag. 633**

| | |
|---|---|
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |




| Condiciones Corte<br>Cutting Conditions<br>Conditions coupe | |
|---|---|
| f<br>mm | $a_p$<br>mm |
| 0,10-2,50 | 2,50 |

## SPMG

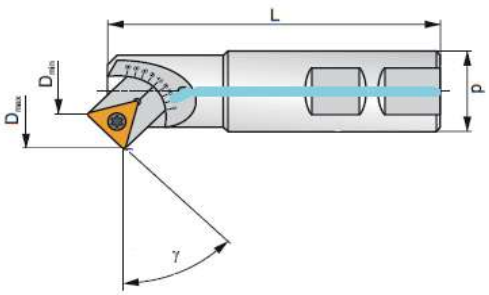
| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones<br>Dimensions | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | l | S | d1 | r |
| SPMG-090408-ZMG | | | | | | | ● | | | 9,8 | 4,3 | 4,5 | 0,8 |
| SPMG-090408-ZRG | | | | | | | | ● | | 9,8 | 4,3 | 4,5 | 0,8 |

**Plaquita** / Insert / Plaquette:
**Pag. 633**

# Ref. 8297

**PORTA-PLAQUITAS ACHAFLANADO AJUSTABLE CHS REFRIGERACIÓN INTERIOR**
Internal Cooling CHS Adjustable Angle Chamfering Tool-Holder
Porte-plaquettes chanfreinage angle réglable CHS lubrification interne

New!



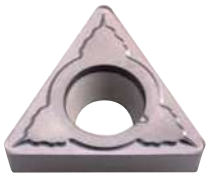

*** Ángulo ajustable**
**Adjustable Angle**
Angle réglable

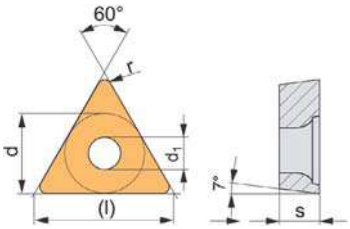
| Tipo Mecanizado<br>Machining Type - Type d'Usinage | | |
|---|---|---|
| | | |
| | | |
| | | |
| | | ● |

| ISO | Dmax | Dmin | d | L | γ° | N° Art. | € | Ref. 8811 | | Ref. 8816 | | Ref. 8816 | | Ref. 8801 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CHS25H-05-31-TC16 | 31 | 5 | 25 | 100 | 10-80 | 77499 | **251,85** | **Z-H21**<br>Art. 77503<br>**68,19 €** | 1 | **M6X15**<br>Art. 77504<br>**3,42 €** | 5 | **M3,5X8,5**<br>Art. 70740<br>**3,42 €** | 5 | **ZT-15**<br>Art. 10512<br>**11,06 €** | 1 |

**Plaquita** / Insert / Plaquette:
**Pag. 541**

| | |
|---|---|
| | **Placa Base** - Base Plate - Plaque dae base |
| | **Tornillo** - Screw - Vis |
| | **Tornillo** - Screw - Vis |
| | **Destornillador** - Screwdriver - Tournevis |






## TCMT

| ISO | Calidades / Qualities / Qualités | | | | | | | | | Dimensiones Dimensions | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | C-526 | P-605 | P-610 | P-615 | P-620 | P-625 | P-630 | P-640 | P-010 | l | d | s | d1 | r |
| TCMT-16T308-E-ZRR | | | | | | ● | | | | 16,5 | 9,5 | 3,97 | 4,4 | 0,8 |

**Plaquita** / Insert / Plaquette:
**Pag. 541**

# CÓDIGOS ISO ELECCIÓN PLAQUITAS FRESADO
Milling Insert Choice ISO Codes
Codes ISO choix **plaquettes fraisage**

## 1
**Forma Plaquita** / Insert Shape / Forme plaquette

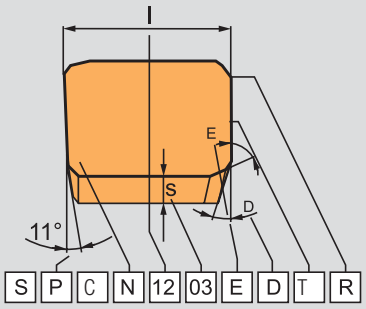
| | | | |
|---|---|---|---|
| H | O | P | R |
| S | T | C 80° | D 55° |
| E 75° | M 86° | V 35° | W 80° |
| L | A 85° | B 82° | K 55° |

## 2
**Angulo Incidencia**
Clearance Angle / Angle d'incidence

| | |
|---|---|
| A 3° | B 5° |
| C 7° | D 15° |
| E 20° | F 25° |
| G 30° | N 0° |
| P 11° | O Especial Special |

## 4
**Tipo Plaquita**
Insert type / Type plaquette

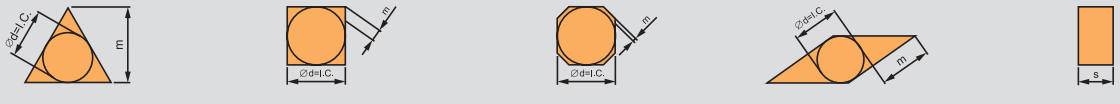
| | |
|---|---|
| N | R |
| F | A |
| M | G |
| W | T |
| Q | X Especial Special |




| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| ISO | S | P | G | N |
| | S | P | K | N |
| ANSI | S | P | G | |
| | S | P | K | N |

## 3
**Tolerancias** / Tolerances / Tolérances

| Símbolo Symbol Symbole | Tolerancias / Tolerances / Tolérances [mm] | | | Tolerancias [Pulg.] / Tolerances [Inch] / Tolérances [Pouc.] | | |
|---|---|---|---|---|---|---|
| | m (±) | s (±) | d = I.C. (±) | m (±) | s (±) | d = I.C. (±) |
| A | 0,005 | 0,025 | 0,025 | 0,0002 | 0,001 | 0,0010 |
| F | 0,005 | 0,025 | 0,013 | 0,0002 | 0,001 | 0,0005 |
| C | 0,013 | 0,025 | 0,025 | 0,0005 | 0,001 | 0,0010 |
| H | 0,013 | 0,025 | 0,013 | 0,0005 | 0,001 | 0,0005 |
| E | 0,025 | 0,025 | 0,025 | 0,0010 | 0,001 | 0,0010 |
| G | 0,025 | 0,130 | 0,025 | 0,0010 | 0,005 | 0,0010 |
| J | 0,005 | 0,025 | 0,05 ÷ 0,13 | 0,0002 | 0,001 | 0,002 ÷ 0,005 |
| K | 0,013 | 0,025 | 0,05 ÷ 0,13 | 0,0005 | 0,001 | 0,002 ÷ 0,005 |
| L | 0,025 | 0,025 | 0,05 ÷ 0,13 | 0,0010 | 0,001 | 0,002 ÷ 0 005 |
| M | 0,08 ÷ 0,18 | 0,130 | 0,05 ÷ 0,13 | 0,003 ÷ 0,007 | 0,005 | 0,002 ÷ 0 005 |
| N | 0,08 ÷ 0,18 | 0,025 | 0,05 ÷ 0,13 | 0,003 ÷ 0,007 | 0,001 | 0,002 ÷ 0,005 |
| U | 0,05 ÷ 0,38 | 0,130 | 0,05 ÷ 0,13 | 0,005 ÷ 0,015 | 0,005 | 0,003 ÷ 0,010 |

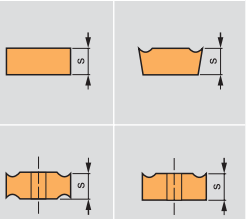


# CÓDIGOS ISO ELECCIÓN PLAQUITAS FRESADO
Milling Insert Choice ISO Codes
Codes ISO choix **plaquettes fraisage**

## 5
Longitud Filo Corte / Cutting Edge Length / Longuer arête coupe

| d = I.C. | | R | S | T | C | D | V | W |
|---|---|---|---|---|---|---|---|---|
| mm | [" ] | | | | | | | |
| 3,97 | 5/32" | | | 06 | | | | |
| 5,00 | - | 05 | | | | | | |
| 5,56 | 7/32" | | | 09 | | | | 03 |
| 6,00 | - | 06 | | | | | | |
| 6,35 | 1/4" | | | 11 | 06 | 07 | | 04 |
| 8,00 | - | 08 | | | | | | |
| 9,525 | 3/8" | 09 | 09 | 16 | 09 | 11 | 16 | 06 |
| 10,0 | - | 10 | | | | | | |
| 12,0 | - | 12 | | | | | | |
| 12,7 | 1/2" | 12 | 12 | 22 | 12 | 15 | | 08 |
| 15,875 | 5/8" | 15 | 15 | 27 | 16 | | | |
| 16,0 | - | 16 | | | | | | |
| 19,05 | 3/4" | 19 | 19 | 33 | 19 | | | |
| 20,0 | - | 20 | | | | | | |
| 25,0 | - | 25 | | | | | | |
| 25,4 | 1" | 25 | 25 | | 25 | | | |
| 31,75 | 1 1/4" | 31 | | | | | | |
| 32,0 | - | 32 | | | | | | |

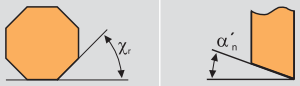
## 6
Espesor / Thickness / Épaisseur



| Símbolo /Symbol | s | |
|---|---|---|
| | [m m] | ["] |
| 01 | 1,59 | 1/16" |
| T1 | 1,98 | 5,64" |
| 02 | 2,38 | 3/32" |
| 03 | 3,18 | 1/8" |
| T3 | 3,97 | 5,32" |
| 04 | 4,76 | 3/16" |
| 05 | 5,56 | 7/32" |
| 06 | 6,35 | 1/4" |
| 07 | 7,94 | 5/16" |
| 09 | 9,52 | 3/8" |

## 7
Angulo filo corte / Cutting edge angle / Angle arête coupe

Angulo incidencia / Clearance angle / Angle incidence



| | $\chi_r$ | | $\alpha'_n$ |
|---|---|---|---|
| A | 45° | A | 3° |
| D | 60° | B | 5° |
| E | 75° | C | 7° |
| F | 85° | D | 15° |
| P | 90° | E | 20° |
| Z | Especial / Special | F | 25° |
| | | G | 30° |
| | | N | 0° |
| | | P | 11° |
| | | Z | Especial / Special |

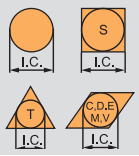
ZZ - Especial / Special

| 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|
| 12 | 03 | 08 | | |
| 12 | 03 | ED | S | R |

| 5a | 6a | 7a | 8 | 9 |
|---|---|---|---|---|
| 4 | 2 | 2 | | |
| 4 | 2 | ED | S | R |

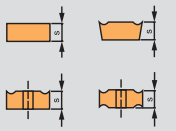
# ANSI

## 5a
Círculo inscrito / Inscribed circle / Cercle inscrite




| Symbol | d = I.C. | |
|---|---|---|
| | [m m] | ["] |
| 1 | 3,175 | 1/8" |
| (1.2) | 3,969 | 5/32" |
| (1.5) | 4,763 | 3/16" |
| (1.8) | 5,556 | 7/32" |
| 2 | 6,350 | 1/4" |
| (2.5) | 7,938 | 5/16" |
| 3 | 9,525 | 3/8" |
| 4 | 12,700 | 1/2" |
| 5 | 15,875 | 5/8" |
| 6 | 19,050 | 3/4" |
| 7 | 22,225 | 7/8" |
| 8 | 25,400 | 1" |
| 10 | 31,750 | 5/8" |

## 6a
Espesor / Thickness / Épaisseur



| Symbol | s | |
|---|---|---|
| | [m m] | ["] |
| 1 | 1,588 | 1/16" |
| (1.2) | 1,984 | 5/64" |
| (1.5) | 2,381 | 3/32" |
| (1.8) | 3,175 | 1/8" |
| 2 | 3,969 | 5/32" |
| (2.5) | 4,763 | 3/16" |
| 3 | 5,556 | 7/32" |
| 4 | 6,350 | 1/4" |
| 5 | 7,938 | 5/16" |
| 6 | 9,525 | 3/8" |
| 7 | 11,113 | 7/16" |
| 8 | 12,700 | 1/2" |
| 9 | 14,288 | 9/16" |
| 10 | 15,875 | 5/8" |

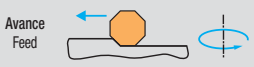
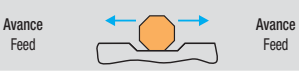
## 7a
Radio vértice / Nose radius / Rayon pointe

| Symbol | $r_\varepsilon$ | |
|---|---|---|
| | [m m] | ["] |
| 0 | 0 050 | 1/512" |
| (0.2) | 0 099 | 1/256" |
| (0.5) | 0,198 | 1/128" |
| 1 | 0,397 | 1/64" |
| 2 | 0,794 | 1/32" |
| 3 | 1,191 | 3/64" |
| 4 | 1,588 | 1/16" |
| 5 | 1,984 | 5/64" |
| 6 | 2,381 | 3/32" |
| 7 | 2,778 | 7/64" |
| 8 | 3,175 | 1/8" |
| 10 | 3,969 | 5/32" |
| 12 | 4,763 | 3/16" |
| 14 | 5,556 | 7/32" |
| 16 | 6,350 | 1/4" |
| x | Otros/Others/Autres | |

## 8
Designación Filo Corte / Cutting Edge Condition / Description arête coupe

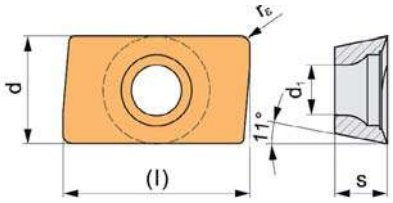
| | |
|---|---|
| F — Filos agudos / Sharp edges / Arêtes aigües | E — Filos redondeados / Rounded edges / Arêtes arrondes |
| T — Filos con faceta / Edges with facet / Arêtes avec facette | S — Filos redondeados con faceta / Rounded edges with facet / Arêtes arrondes avec facette |
| K — Filos con doble faceta / Edges with double facet / Arêtes avec double facette | P — Filos redondeados con doble faceta / Rounded edges with double facet / Arêtes arrondes avec double facette |

## 9
Dirección Avance / Feed Direction / Direction avance

| | |
|---|---|
| R | |
| L |   |
| N |   |

# Ref. 8633

## PLAQUITA INTERCAMBIABLE FRESADO APHT
APHT Milling Indexable Insert
Plaquette fraisage APHT

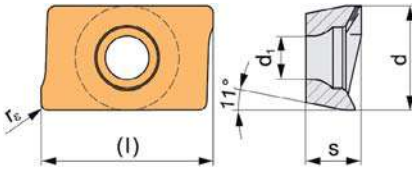



| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-010 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **Aluminio - Aluminium -** Aluminium | | | | | | | | | | |
| **APHT-160408PDFR-FA** | 16,00 | 9,45 | 4,76 | 4,50 | 0,80 | 0,07-0,20 | 1,00-13,50 | 10 | 20929 | **22,78** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 609, 616**

# Ref. 8636

## PLAQUITA INTERCAMBIABLE FRESADO APET 10F
APET 10F Milling Indexable Insert
Plaquette fraisage APET 10F

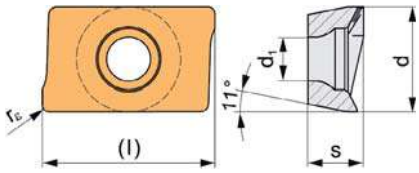



| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-010 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **Aluminio - Aluminium -** Aluminium | | | | | | | | | | |
| **APET-1003PDFR-FA** | 10,00 | 6,70 | 3,50 | 2,88 | 0,50 | 0,07-0,20 | 1,00-9,00 | 10 | 20933 | **20,88** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 608, 615**

# Ref. 8639

## PLAQUITA INTERCAMBIABLE FRESADO APKT 10M
APKT 10M Milling Indexable Insert
Plaquette fraisage APKT 10M

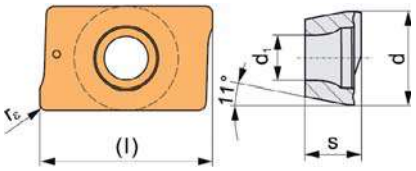



| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-620 | N° Art. P-630 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **APKT-1003PDER-M** | 10,00 | 6,70 | 3,50 | 2,88 | 0,50 | 0,08-0,20 | 1,00-9,00 | 10 | 20934 | 20935 | **10,24** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 608, 615**

# Ref. 8642

## PLAQUITA INTERCAMBIABLE FRESADO APKT 16
APKT 16 Milling Indexable Insert
Plaquette fraisage APKT 16

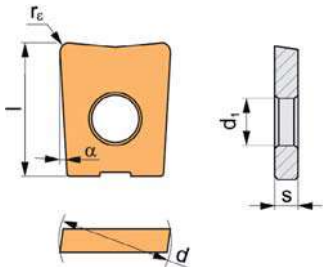



| | ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-620 | N° Art. P-630 | N° Art. P-640 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **APKT-1604PDER** | 16,00 | 9,45 | 5,35 | 4,50 | 0,80 | 0,07-0,20 | 1,00-13,50 | 10 | 35175 | 20938 | 20939 | **13,76** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 609, 616**

# Ref. 8645

## PLAQUITA INTERCAMBIABLE FRESADO LC
LC Milling Indexable Insert
Plaquette fraisage LC



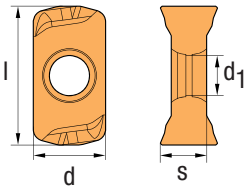

| | ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-615 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **LC-1210** | 14,00 | 12,00 | 2,50 | 5,00 | 1,00 | 0,08-0,25 | 0,10-1,00 | 10 | 20940 | **42,24** |
| | **LC-1610** | 16,00 | 16,00 | 3,00 | 5,00 | 1,00 | 0,08-0,30 | 0,10-1,00 | 10 | 20941 | **45,89** |
| | **LC-2010** | 18,00 | 20,00 | 3,00 | 5,00 | 1,00 | 0,08-0,30 | 0,10-1,00 | 10 | 20942 | **52,83** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 621**

# Ref. 8691

## PLACA INTERCAMBIABLE FRESADO LOGX
LOGX Milling Indexable Insert
Plaquette Fraisage LOGX

New!




| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-630 | N° Art. P-640 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **Semi-Acabado / Semi-Finishing** / Semi-Finition | | | | | | | | | | |
| **LOGX-030310-ZSG** | 11,90 | 6,20 | 3,96 | 3,45 | 0,30-1,60 | 0,30-0,90 | 10 | 44834 | 70190 | **18,97** |

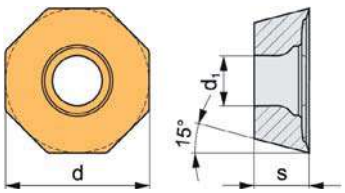
**Ejemplo Pedido** / Order Example / Exemple commande:
**Ref. 8691 LOGX-030310-ZSG P-630**

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pags. 612, 598**

- **Con las plaquitas de fresado de doble cara LOGX obtenemos 4 filos de corte**
- **Los filos de corte de alta precisión y alto avance son adecuados para el mecanizado de aleaciones termorresistentes y consiguen un excelente acabado superficial**
- **Profundidad máxima de corte de 0,90 mm**
- **With LOGX double-sided milling inserts, we obtain 4 cutting edges.**
- **The high-precision and high-feed cutting edges are suitable for machining heat-resistant alloys and achieve an excellent surface finish.**
- **Maximum cutting depth of 0.90 mm.**
- Avec des plaquettes de fraisage double face LOGX, nous obtenons 4 arêtes de coupe.
- Les arêtes de coupe haute précision et à avance élevée conviennent à l'usinage des alliages résistants à la chaleur et permettent d'obtenir une excellente finition de surface.
- Profondeur de coupe maximale de 0,90 mm.

# Ref. 8648

## PLAQUITA INTERCAMBIABLE FRESADO ODMT
ODMT Milling Indexable Insert
Plaquette fraisage ODMT

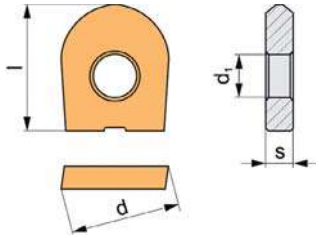



| ISO | Dimensiones Dimensions d mm | s mm | $d_1$ mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-526 | N° Art. P-630 | N° Art. P-640 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **ODMT-0605ZZN** | 15,87 | 5,56 | 5,50 | 0,15-0,45 | 1,00-8,60 | 10 | 30137 | 20943 | 20944 | **19,09** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 604**

# Ref. 8651

## PLAQUITA INTERCAMBIABLE FRESADO RC
RC Milling Indexable Insert
Plaquette fraisage RC



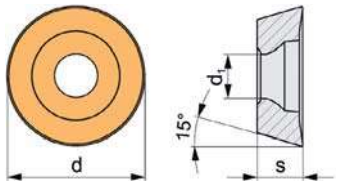
| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-615 | N° Art. P-640* | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **RC-10** | 11,50 | 10,00 | 2,50 | 4,00 | 0,10-0,33 | 0,30-2,50 | 10 | 20945 | | **37,65** |
| **RC-12** | 12,00 | 12,00 | 2,50 | 5,00 | 0,10-0,35 | 0,40-3,00 | 10 | 20947 | | **40,51** |
| **RC-16** | 14,00 | 16,00 | 3,00 | 5,00 | 0,10-0,40 | 0,50-4,00 | 10 | 20949 | | **45,89** |
| **RC-20** | 16,00 | 20,00 | 3,00 | 5,00 | 0,10-0,50 | 0,60-5,00 | 10 | 20951 | 20952 | **52,83** |
| **RC-25** | 21,50 | 25,00 | 4,00 | 6,00 | 0,10-0,55 | 0,60-6,00 | 10 | 20953 | 20954 | **70,88** |

* **Hasta fin de existencias**
**while stock lasts /** jusqu'à la fin de stock

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 620**

# Ref. 8654

## PLAQUITA INTERCAMBIABLE FRESADO RDHT
RDHT Milling Indexable Insert
Plaquette fraisage RDHT



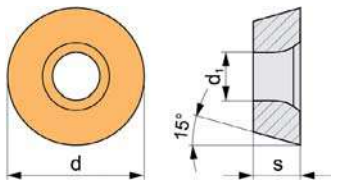
| ISO | Dimensiones Dimensions d mm | s mm | $d_1$ mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-610* | N° Art. P-620 | € |
|---|---|---|---|---|---|---|---|---|---|
| **RDHT-0702MOT** | 7,00 | 2,38 | 2,90 | 0,10-0,18 | 0,50-1,50 | 10 | 29974 | 20955 | **10,94** |
| **RDHT-1003MOT** | 10,00 | 3,18 | 4,10 | 0,10-0,24 | 0,50-2,50 | 10 | | 20956 | **11,77** |
| **RDHT-12T3MOT** | 12,00 | 3,97 | 4,10 | 0,10-0,27 | 1,00-2,50 | 10 | | 20957 | **13,27** |
| **RDHT-1604MOT** | 16,00 | 4,76 | 5,20 | 0,10-0,33 | 1,00-3,50 | 10 | | 20958 | **16,95** |

* **Hasta fin de existencias**
**while stock lasts /** jusqu'à la fin de stock

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 618, 619**

# Ref. 8657

## PLAQUITA INTERCAMBIABLE FRESADO RDHW
RDHW Milling Indexable Insert
Plaquette fraisage RDHW



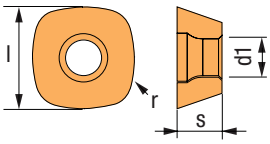
| ISO | Dimensiones Dimensions d mm | s mm | $d_1$ mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-610 | N° Art. P-620 | € |
|---|---|---|---|---|---|---|---|---|---|
| **RDHW-0702MOT** | 7,00 | 2,38 | 2,90 | 0,10-0,18 | 0,50-1,50 | 10 | 20959 | 20960 | **10,94** |
| **RDHW-1003MOT** | 10,00 | 3,18 | 4,10 | 0,10-0,24 | 0,50-2,50 | 10 | 20961 | 20962 | **11,28** |
| **RDHW-12T3MOT** | 12,00 | 3,97 | 4,10 | 0,10-0,27 | 1,00-2,50 | 10 | 20963 | 20964 | **11,97** |
| **RDHW-1604MOT** | 16,00 | 4,76 | 5,20 | 0,10-0,33 | 1,00-3,50 | 10 | 20965 | 20966 | **13,04** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 618, 619**

# Ref. 8693

## PLACA INTERCAMBIABLE FRESADO SDMT
SDMT Milling Indexable Insert
Plaquette Fraisage SDMT

New!



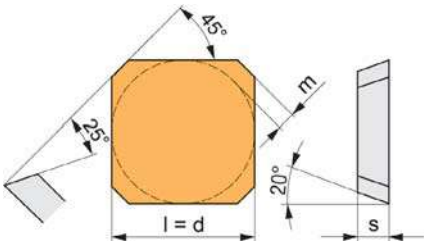

| ISO | Dimensiones Dimensions l mm | r mm | s mm | $d_1$ mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-620 | N° Art. P-630 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **SDMT-1205ZDTN-ZMG** | 12,7 | 15 | 5,56 | 4,6 | 0,5-1,8 | 0,3-1,5 | 10 | 54992 | 48659 | **10,54** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pags. 613, 601**

- **Plaquita económica con 4 robustos filos de corte y de alto avance para una amplia variedad de materiales y aplicaciones.**
- **Profundidad máxima de corte de 1,5 mm**
- **Economical insert with 4 strong cutting edges and high feed for a wide variety of materials and applications**
- **Maximum cutting depth of 1.5 mm**
- Plaquette économique avec 4 arêtes de coupe robustes et avance élevée pour une large gamme de matériaux et d'applications
- Profondeur de coupe maximale de 1,5 mm

# Ref. 8660

## PLAQUITA INTERCAMBIABLE FRESADO SEKN FSN
SEKN FSN Milling Indexable Insert
Plaquette fraisage SEKN FSN

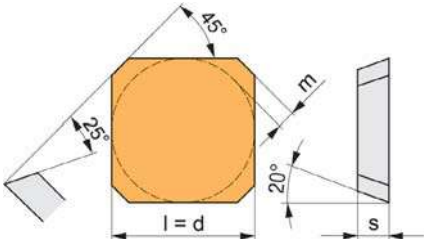



| ISO | Dimensiones Dimensions l mm | d mm | s mm | m mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-620 | € |
|---|---|---|---|---|---|---|---|---|---|
| **SEKN-1203AFSN** | 12,70 | 12,70 | 3,18 | 1,60 | 0,15-0,30 | 1,00-6,50 | 10 | 20968 | **9,82** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 603**

# Ref. 8663

## PLAQUITA INTERCAMBIABLE FRESADO SEKR FSN
SEKR FSN Milling Indexable Insert
Plaquette fraisage SEKR FSN

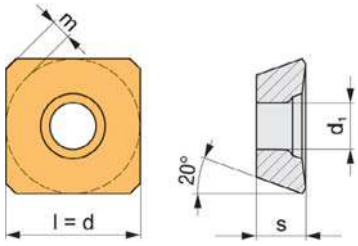



| | ISO | Dimensiones Dimensions l mm | d mm | s mm | m mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-620 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| | **SEKR-1203AFSN** | 12,70 | 12,70 | 3,18 | 1,60 | 0,20-0,30 | 1,00-6,50 | 10 | 20969 | **11,28** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 603**

# Ref. 8666

## PLAQUITA INTERCAMBIABLE FRESADO SEHT FSN/FTN
SEHT FSN/FTN Milling Indexable Insert
Plaquette fraisage SEHT FSN/FTN

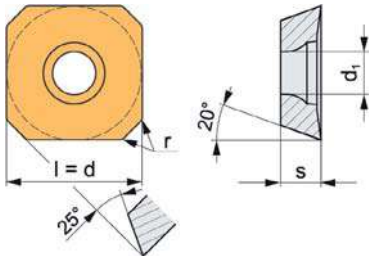



| | ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | m mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-526 | N° Art. P-620 | N° Art. P-640 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SEHT-1204AFSN** | 12,70 | 12,70 | 4,76 | 5,50 | 1,60 | 0,10-0,30 | 1,00-6,50 | 10 | 30532 | | | **13,06** |
| | **SEHT-1204AFTN** | 12,70 | 12,70 | 4,76 | 5,50 | 1,60 | 0,10-0,30 | 1,00-6,50 | 10 | | 20971 | 20973 | **13,06** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 602**

# Ref. 8667

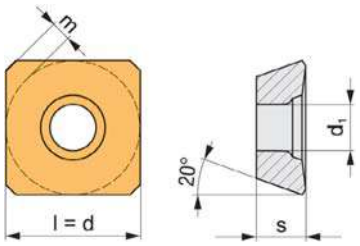
## PLAQUITA INTERCAMBIABLE FRESADO SEET PM
SEET PM Milling Indexable Insert
Plaquette fraisage SEET PM




| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. C-526 | N° Art. P-630 | N° Art. P-640 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SEET-12T3M-PM** | 13,40 | 13,40 | 3,97 | 4,20 | 0,20-0,35 | 1,00-6,50 | 10 | 29979 | 26219 | 29980 | **16,95** |

# Ref. 8669

## PLAQUITA INTERCAMBIABLE FRESADO SEHT FA
SEHT FA Milling Indexable Insert
Plaquette fraisage SEHT FA

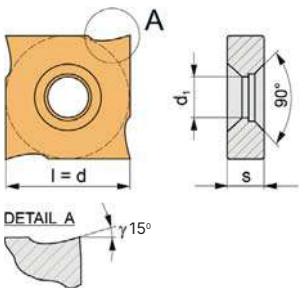



| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | m mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-610 | N° Art. P-010 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Aluminio - Aluminium -** Aluminium | | | | | | | | | | | |
| **SEHT-1204AFFN-FA** | 12,70 | 12,70 | 4,76 | 5,50 | 1,60 | 0,10-0,30 | 0,20-0,45 | 10 | 20974 | 20975 | **19,39** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 602**

# Ref. 8672

## PLAQUITA INTERCAMBIABLE FRESADO SNHQ
SNHQ Milling Indexable Insert
Plaquette fraisage SNHQ



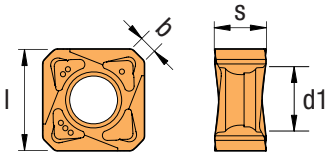

| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | | N° Art. P-640 | € |
|---|---|---|---|---|---|---|---|---|
| **SNHQ-1203-AZTN** | 12,70 | 12,70 | 3,20 | 5,00 | 0,20-0,40 | 10 | 38106 | **25,12** |
| **SNHQ-1204-AZTN** | 12,70 | 12,70 | 4,50 | 5,00 | 0,20-0,40 | 10 | 38410 | **27,41** |
| **SNHQ-1205-AZTN** | 12,70 | 12,70 | 5,40 | 5,00 | 0,20-0,50 | 10 | 38412 | **29,04** |
| **SNHQ-1207-AZTN** | 12,70 | 12,70 | 7,00 | 5,00 | 0,20-0,50 | 10 | 38980 | **31,49** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 617**

# Ref. 8673

## PLACA INTERCAMBIABLE FRESADO SNMX
SNMX Milling Indexable Insert
Plaquette Fraisage SNMX

New!



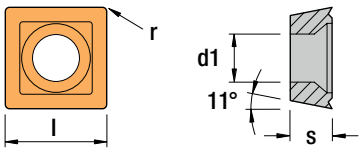

| | ISO | Dimensiones Dimensions l mm | d mm | s mm | b mm | $d_1$ mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-630 | N° Art. P-640 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SNMX-1205-ZMG** | 12,7 | 12,7 | 6,4 | 1,5 | 6 | 0,08-0,3 | 0,3-6 | 10 | 48665 | 70785 | **20,30** |
| | **SNMX-1205-ZRG** | 12,7 | 12,7 | 6,4 | 1,5 | 6 | 0,08-0,3 | 0,3-6 | 10 | 70788 | 70829 | **20,30** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 605**

# Ref. 8665

## PLACA INTERCAMBIABLE FRESADO SPMG
SPMG Milling Indexable Insert
Plaquette Fraisage SPMG

New!

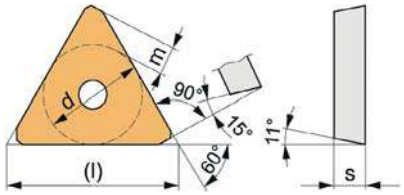



| | ISO | Dimensiones Dimensions l mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-630 | N° Art. P-640 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SPMG-090408-ZMG** | 9,8 | 4,3 | 4,05 | 0,8 | 0,10-0,15 | 2,5 | 10 | 26654 | | **11,42** |
| | **SPMG-090408-ZRG** | 9,8 | 4,3 | 4,05 | 0,8 | 0,10-0,15 | 2,5 | 10 | | 77476 | **11,42** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes:
**Pag. 622**

# Ref. 8675

## PLAQUITA INTERCAMBIABLE FRESADO TPKN
TPKN Milling Indexable Insert
Plaquette fraisage TPKN

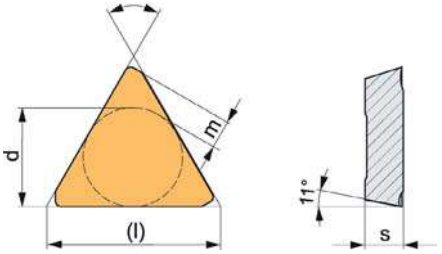



| ISO | Dimensiones Dimensions l mm | d mm | s mm | m mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-610 | N° Art. P-620 | N° Art. P-640 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TPKN-1603PDSR | 16,50 | 9,52 | 3,18 | 2,45 | 0,08-0,20 | 1,00-13,00 | 10 | | 20984 | 20985 | **11,43** |
| TPKN-2204PDSR | 22,00 | 12,70 | 4,76 | 3,55 | 0,10-0,30 | 1,00-18,00 | 10 | 35176 | 20990 | 20991 | **12,68** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 610, 611**

# Ref. 8678

## PLAQUITA INTERCAMBIABLE FRESADO TPKR
TPKR Milling Indexable Insert
Plaquette fraisage TPKR



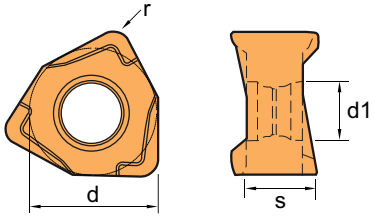

| ISO | Dimensiones Dimensions l mm | d mm | s mm | m mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-620 | N° Art. P-640 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| TPKR-1603PDSR | 16,50 | 9,52 | 3,18 | 2,45 | 0,08-0,20 | 1,00-16,00 | 10 | 20993 | | **8,12** |
| TPKR-2204PDSR | 22,00 | 12,70 | 4,76 | 3,55 | 0,10-0,30 | 1,00-22,00 | 10 | 20995 | 20996 | **12,68** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 610, 611**

# Ref. 8679

## PLACA INTERCAMBIABLE FRESADO XNMX
XNMX Milling Indexable Insert
Plaquette fraisage XNMX

Video



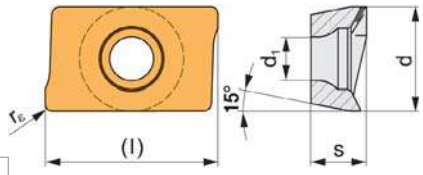

| ISO | Dimensiones Dimensions d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-620 | N° Art. P-630 | N° Art. P-640 | € |
|---|---|---|---|---|---|---|---|---|---|---|---|
| XNMX-080608-ZMG | 12,53 | 6,5 | 4,5 | 0,8 | 0,1-0,3 | 0,3-7,0 | 10 | 30930 | 83759 | | **21,83** |
| XNMX-080608-ZRG | 12,53 | 6,5 | 4,5 | 0,8 | 0,1-0,3 | 0,3-7,0 | 10 | | | 83760 | **21,83** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 606**

# Ref. 8680

## PLAQUITA INTERCAMBIABLE FRESADO XOET
XOET Milling Indexable Insert
Plaquette fraisage XOET

**ALTO RENDIMIENTO**
**High Performance**
Haut rendement

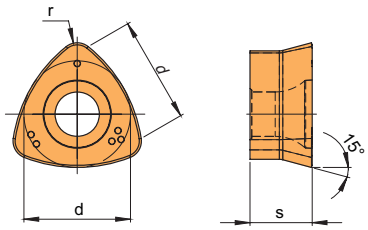



| ISO | Dimensiones Dimensions l mm | d mm | s mm | $d_1$ mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-720 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **XOET-060204** | 6,96 | 3,98 | 2,30 | 1,92 | 0,4 | 0,05-0,07 | 1,00-4,00 | 10 | 19646 | **15,26** |
| **XOET-060208** | 6,96 | 3,98 | 2,30 | 1,92 | 0,8 | 0,05-0,07 | 1,00-4,00 | 10 | 19647 | **15,26** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 614**

# Ref. 8690

## PLAQUITA INTERCAMBIABLE FRESADO WNMW
WNMW Milling Indexable Insert
Plaquette fraisage WNMW



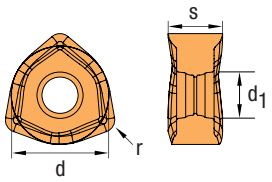

| ISO | Dimensiones Dimensions d mm | s mm | r mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-610 | N° Art. P-620 | € |
|---|---|---|---|---|---|---|---|---|---|
| **WNMW-1207SP** | 12,70 | 7,00 | 2,00 | 0,30-1,50 | 0,50-1,80 | 10 | 59772 | 59773 | **14,80** |

**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 599**

# Ref. 8692

## PLACA INTERCAMBIABLE FRESADO WNMX
WNMX Milling Indexable Insert
Plaquette Fraisage WNMX

New!



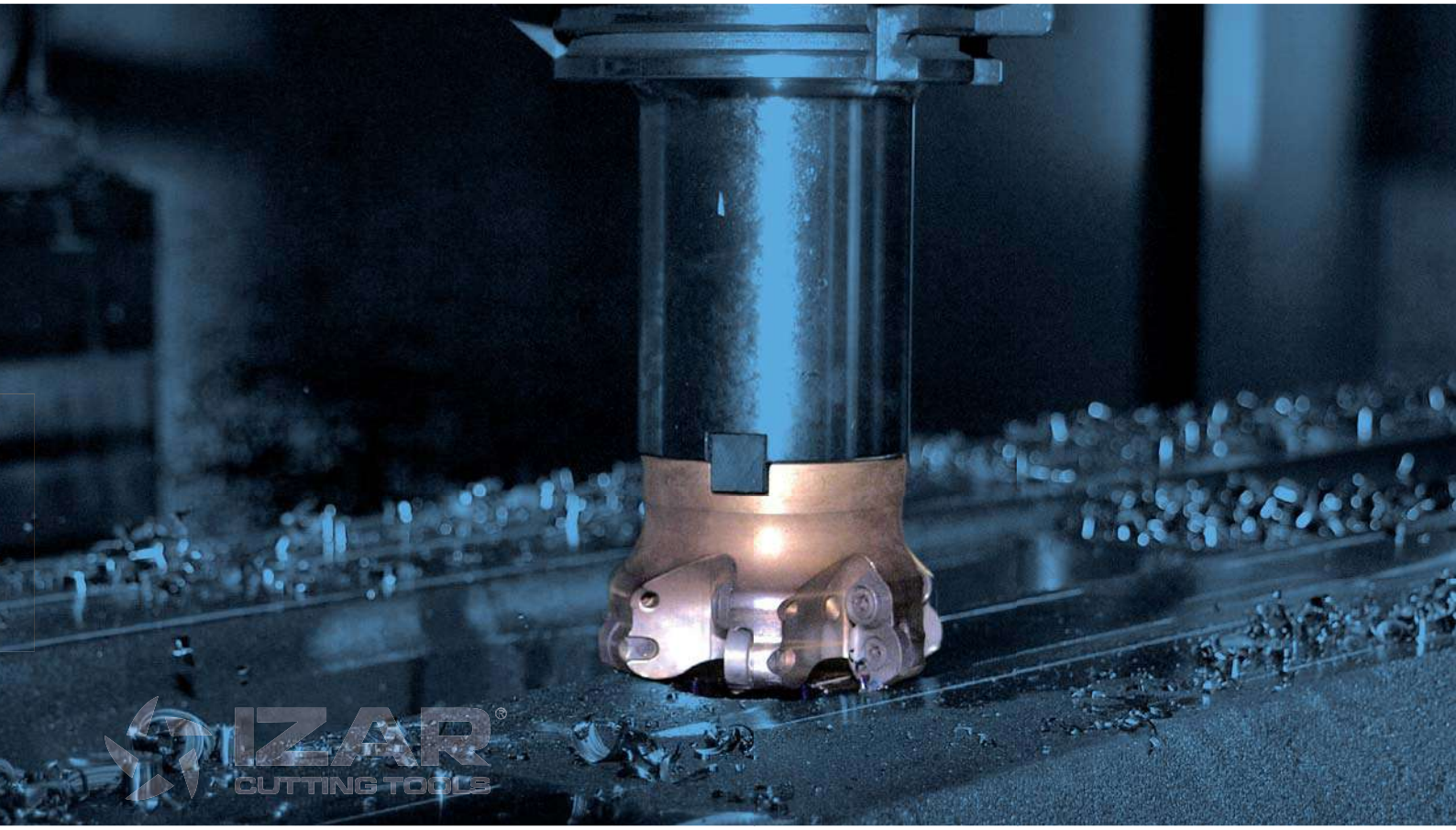

| ISO | Dimensiones Dimensions d mm | s mm | r mm | $d_1$ mm | Condiciones Corte Cutting Conditions Conditions coupe f mm | $a_p$ mm | | N° Art. P-630 | N° Art. P-640 | € |
|---|---|---|---|---|---|---|---|---|---|---|
| **WNMX-09T316-ZMG** | 9,53 | 3,97 | 1,60 | 3,60 | 0,40-1,50 | 0,40-1,35 | 10 | 48662 | 74819 | **15,04** |

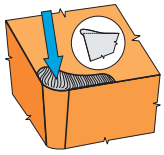
**Porta Plaquitas** / Tool Holder / Porte-Plaquettes: **Pag. 600**

- **Con las plaquitas de fresado de doble cara WNMX obtenemos 6 filos de corte.**
- **Plaquita económica de alto avance multifuncional.**
- **Profundidad máxima de corte de 1,35 mm.**

- **With double-sided WNMX milling inserts, we obtain 6 cutting edges.**
- **An economical, high-feed multi-functional insert.**
- **Maximum cutting depth of 1.35 mm.**

- Avec les plaquettes de fraisage double face WNMX, nous obtenons 6 arêtes de coupe.
- Une plaquette économique à avance élevée multifonctionnelle.
- Profondeur de coupe maximale de 1,35 mm.





**FILO APORTACIÓN**

**Causas:** Adherencia del material trabajado en la arista de corte; su ruptura puede causar el astillado de la arista y, como consecuencia, mal acabado superficial.

**Soluciones:**

- Incrementar Vc y avance
- Utilizar calidades con recubrimiento
- Utilizar una geometría de corte diferente
- No utilizar refrigeración

**BUILT-UP EDGE**

**Causes:** Sticking of machined material on the cutting edge. Its tear-off can cause the brittle crack of the edge, consequently the surface quality gets worse.

**Solutions:**

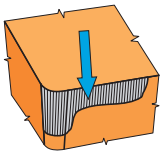
- Increase cutting speed & feed
- Use coated grade
- Use different cutting geometry
- No coolant

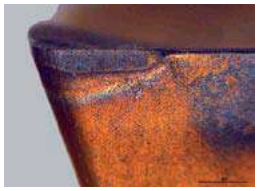
**FILET AVEC MATÉRIEL**

**Causes:** Matériel usiné reste soudé au filet de coupe, lui créant dommages. Mauvaise finition de surface.

**Solutions:**

- Augmenter vitesse coupe et avance
- Appliquer types de matériaux revêtus (spécialllemment avec PVD)
- Employer une diffèrente géométrie de coupe (plus positive et affutée)
- Pas de refroidissement





**DESGASTE INCIDENCIA**

**Causas:** Causado por la fricción entre la plaquita y el material a trabajar. No es posible eliminarlo, solamente reducirlo.

**Soluciones:**

- Usar una calidad con mayor resistencia al desgaste
- Reducir la velocidad de corte
- Incrementar el avance
- Usar refrigerante o aumentar la presión

**FLANK WEAR**

**Causes:** One of the main criteria of tool life. It appears due to friction of insert to the machined material. It's not possible to fully eliminate it, just to reduce.

**Solutions:**

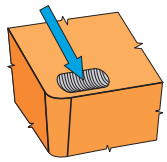
- Use more wear resistant grade
- Reduce cutting speed
- Increase feed
- Use coolant or increase its intensity

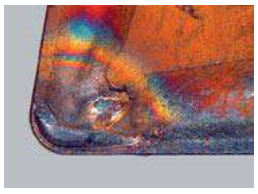
**USURE ANGLE D´INCIDENCE**

**Causes**: Conséquence de friction entre plaquette et matériel à usiner.

**Solutions:**

- Employer une qualité avec plus haute resistance à l´usure
- Employer huile de coupe où augmenter l´intensité
- Reduire la vitesse de coupe
- Augmenter l´avance si < 0.1 mm/tour (pour qualités CVD)





**CRATERIZACIÓN**

**Causas:** Aparece frecuentemente en plaquitas sin rompevirutas.

**Soluciones:**

- Usar una calidad con mayor resistencia al desgaste
- Utilizar una calidad con recubrimiento
- Usar una geometría de corte positiva
- Reducir Vc
- Usar refrigerante o aumentar su presión

**CRATERING**

**Causes:** It appears usually on inserts with plain face.

**Solutions:**

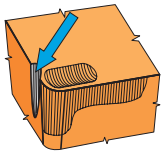
- Use more wear resistance grade
- Use coated grade
- Use positive cutting geometry
- Reduce cutting speed
- Use coolant or increase its intensity

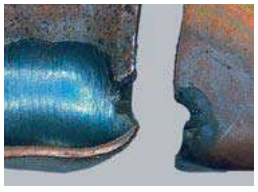
**CRATÈRES**

**Causes:** Apparait beaucoup en plaquette sans brisecopeaux.

**Solutions:**

- Employer une qualité avec plus haute résistance à l´usure.
- Employer huile de coupe où augmenter l´intensité
- Reduire la 1ere vitesse de coupe et/où avance
- Employer une géométrie de coupe différente (plus positive)
- Employer une qualité avec revêtement





**DESGASTE ARISTA SECUNDARIA**

**Causas:** Aparece frecuentemente en el torneado y limita la vida de la plaquita por oxidación y craterización.

**Soluciones:**

- Usar una calidad más resistente al desgaste, con recubrimiento $Al_2O_3$
- Reducir Vc
- Usar refrigerante o elevar su intensidad

**OXIDATION GROOVE ON THE MINOR EDGE**

**Causes:** The main criterion which limits the tool life, usually appeared at turning. Oxidation and cratering combined.

**Solutions:**

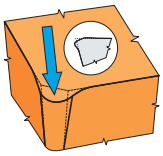
- Use more wear-resistant grade, if possible $Al_2O_3$ coated
- Reduce cutting speed
- Use coolant or increase its intensity

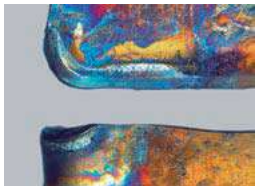
**USURE ARÊTE SECONDAIRE**

**Causes:** Apparait beaucoup sur tournage et limite la vie de la plaquette par oxidation et cratères.

**Solutions:**

- Employer une quatlité avec plus haute résistance à l´usure
- Employer plaquettes avec $Al_2O_3$ si les conditions sont convenables
- Employer huile de coupe où augmenter l´intensité
- Reduire la vitesse de coupe





**DEFORMACIÓN PLÁSTICA**

**Causas:** Elevada fatiga térmica de la arista de corte por la elevada Vc.

**Soluciones:**

- Usar una calidad con mayor resistencia al desgaste
- Reducir Vc y avance.
- Usar una plaquita con un radio mayor
- Usar refrigerante o elevar su intensidad

**PLASTIC DEFORMATION**

**Causes:** Caused by high thermal stress of the cutting edge (high feed and cutting speed).

**Solutions:**

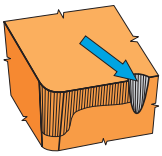
- Use a more wear-resistant grade
- Reduce Vc and feed
- Use an insert with bigger nose radius
- Use coolant or increase its intensity

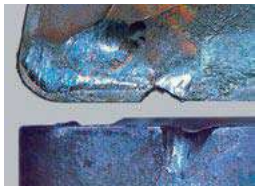
**DÉFORMATION PLASTIQUE**

**Causes:** Trop de pression sur le filet à cause d´une haute vitesse de coupe et avance.

**Solutions:**

- Employer une Qualité plus résistante à l´usure
- Reduire la vitesse de coupe et/ou avance
- Employer huile de coupe où augmenter l´intensité
- Employer une plaquette avec un rayon plus grand





**DESGASTE EN LA ARISTA PRINCIPAL**

**Causas:** Rotura creada en el area de contacto entre arista de corte y superficie de la pieza; causada por el endurecimiento de la superficie mecanizada y por rebabas. Suele aparecer en INOX austeníticos AISI-316-304.

**Soluciones:**

- Usar una calidad más resistente al desgaste y con recubrimiento $Al_2O_3$
- Utilizar una herramienta con menor ángulo de posición

**NOTCH WEAR**

**Causes:** Created in area of contact of the cutting edge with the surface of the work piece. Mainly caused by hardening of the surface layer of work piece and burrs. Usually appears on austenitic stainless steel AISI-316-304.

**Solutions:**

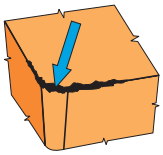
- Use more wear resistante grade and $Al_2O_3$ coated.
- Use a smaller setting angle tool

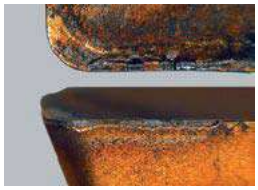
**USURE EN ARÊTE PRINCIPALE**

**Causes:** Rupture sur la surface de contact entre arête de coupe et surface de la pièce, a cause d´augmenter la dureté de la surface usiner et par bavures. Surtout en INOX austénitiques AISI 316-304.

**Solutions:**

- Employer une qualité plus résistante à l´´ usure et avec revêtement $AL_2O_3$
- Employer un outil avec angle d´aproximation inférieur





**ASTILLADO DE LA ARISTA DE CORTE**

**Causas:** Aparece junto con otro tipo de fallo causado por la baja rigidez entre máquina/herramienta/pieza o por formación de viruta.

**Soluciones:**

- Incrementar Vc
- Reducir el avance
- Fresado convencional
- Mejorar evacuación de viruta
- Cambiar posición herramienta
- Mejorar la estabilidad

**CHIPPING OF CUTTING EDGE**

**Causes:** It mainly appears with another type of wear, caused by low ridigity of machine-tool-work piece or hard chip forming.

**Solutions:**

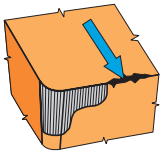
- Increase the cutting speed
- Reduce the feed rate
- Conventional milling
- Improve chip evacuation
- Change cutter positioning
- Improve stability

**COPEAUX SUR LES ARÊTES DE COUPE**

**Causes:** A cause de la faiblesse de la pièce à usiner sur la machine où à cause d´une énorme formation de copeaux.

**Solutions:**

- Augmenter la vitesse de coupe
- Reduire l´avance
- Fraisage Conventionnel
- Améliorer l´évacuation de copeaux
- Changer la position de l´outil
- Améliore la stabilité



**ASTILLADO DE LA ARISTA (FUERA DEL CORTE)**

**Causas:** Causada por una formación de virutas incorrecta, que dañan la arista.

**Soluciones:**

- Variar el avance
- Usar una herramienta con un ángulo de aproximación diferente
- Usar una geometría de plaquita diferente
- Utilizar una calidad más tenaz

**CHIPPING OF CUTTING EDGE (OUT OF CUT)**

**Causes:** Caused by inconvenient chip forming. The chip damages the edge.

**Solutions:**

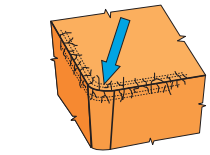
- Change feed.
- Use a different setting angle tool.
- Use different insert geometry
- Use tougher grade

**COPEAUX DEHORS DES ARÊTES DE COUPE**

**Causes:** Formation de copeaux déviées jusqu`aux filets de coupe.

**Solutions:**

- Varier l´avance
- Employer un outil avec un angle d´aproximation différent
- Employer une géométrie de coupe différentes (un autre brise copeaux)



**FISURAS TÉRMICAS**

**Causas:** Causadas por fatiga térmica en la arista de corte por cortes interrumpidos.

**Soluciones:**

- Usar abundante refrigeración o anularla
- Reducir la velocidad de corte
- Reducir el avance
- Usar una calidad más tenaz

**COMB CRACKS**

**Causes:** High thermal stress of the cutting edge at interrupted cut.

**Solutions:**

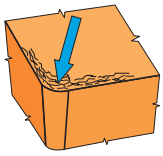
- Use an abundant flow of coolant or shut off the coolant
- Reduce the cutting speed
- Reduce the feed rate
- Use tougher grade

**FISURES THERMIQUES**

**Causes:** Trop de fatigue thermique sur l´arête de coupe par coupe interrompue.

**Solutions:**

- Employer beaucoup de lubrifiant où la fermer
- Réduire la vitesse de coupe
- Réduire l´avance
- Employer le Degré le plus fort
- Employer une qualité plus tenace



**FISURAS A LO LARGO DEL FLANCO**

**Causas:** Generada por fatiga dinámica en el area posterior de la arista de corte.

**Soluciones:**

- Usar una calidad más tenaz
- Cambiar condiciones de corte
- Usar plaquitas de fresado con geometría diferente (...T, ...S, ...K, ...P)
- Cambiar el avance
- Modificar la posición del porta-fresas

**CRACKS ALONG THE FLANK**

**Causes:** High dynamic stress of the area behind the cutting edge.

**Solutions:**

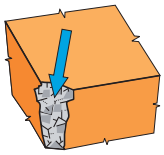
- Use tougher grade
- Change the cutting conditions
- Use different geometry of milling insert or inserts with different cutting edge condition (...T, ...S, ...K, ...P)
- Change the feed
- Change the cutter positioning

**FISURES AU COURS DU FILET**

**Causes:** Trop de stress dynamique de la zone postèrieure à l´arête de coupe.

**Solutions:**

- Employer une qualité plus tenace
- Changer les conditions de coupe
- Employer un géométrie de coupe différente de la plaquette de fraisage où plaquettes avec diffèrente conditions du filet de coupe (...T, ...S, ...K, ...P)
- Changer l´avance
- Changer la position du porte-fraises



**ROTURA DE LA PLAQUITA**

**Causas:** Causas variadas dependiendo del material, condiciones de corte, rigidez de la máquina, calidad del metal duro...

**Soluciones:**

- Usar una calidad más tenaz
- Reducir avance y profundidad de corte
- Usar plaquitas con mayor radio
- Mejorar la rigidez en su conjunto

**INSERT FRACTURE**

**Causes:** Various causes depending on work piece material, grade, condition and rigidity of machine-tool-work piece, extend and wear type, cutting conditions...

**Solutions:**

- Use a tougher grade
- Reduce feed & cutting depth.
- Use a bigger corner radius insert
- Improve stability

**RUPTURE PLAQUETTE**

**Causes:** Variées en fonction du matériel, conditions de coupe, rigidité de la machine, qualité du carbure...

**Solutions:**

- Employer une qualité plus tenace
- Reduire avance et profondeur de coupe
- Employer plaquettes avec Rayon plus grand
- Augmenter la rigidité de l´ensemble

IZAR®
CUTTING TOOLS

# 11.

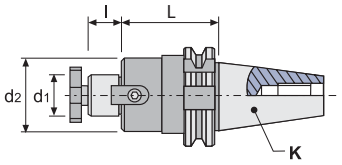
# ACCESORIOS
Accessories
Accessoires


**CONOS PORTAPLAQUITAS FRESADO**
Milling Tool-Holder Adaptors
Adaptateurs Porte-Plaquettes fraisage 642

**PINZAS**
Collets
Pinces 643

# Ref. 8200

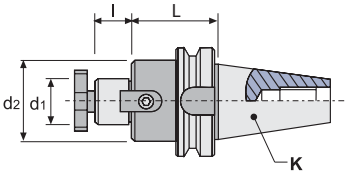
## CONO PORTAPLAQUITAS FRESADO DIN 69871-A-AD
DIN 69871-A-AD Milling Tool-Holder Adaptor
Adaptateur Porte-Plaquettes fraisage DIN 69871-A-AD




| ISO-K | $d_1$ mm | $d_2$ mm | L mm | l mm | N° Art. | € |
|---|---|---|---|---|---|---|
| **40** | **16** | 38 | 35 | 17 | 59928 | **110,46** |
| **40** | **22** | 48 | 35 | 19 | 59929 | **110,46** |
| **40** | **27** | 58 | 60 | 21 | 59930 | **114,26** |
| **40** | **32** | 63 | 60 | 24 | 59931 | **121,89** |
| **40** | **40** | 73 | 60 | 27 | 59932 | **144,73** |
| **50** | **16** | 38 | 35 | 17 | 59933 | **167,60** |
| **50** | **22** | 48 | 35 | 19 | 59935 | **167,60** |
| **50** | **27** | 58 | 40 | 21 | 59936 | **167,60** |
| **50** | **32** | 78 | 50 | 24 | 59941 | **175,20** |
| **50** | **40** | 88 | 50 | 27 | 59942 | **190,46** |
| **50** | **50** | 90 | 65 | 30 | 59944 | **248,13** |

# Ref. 8201

## CONO PORTAPLAQUITAS FRESADO JIS B 6339-BT
JIS B 6339-BT Milling Tool-Holder Adaptor
Adaptateur Porte-Plaquettes fraisage JIS B 6339-BT




| ISO-K | $d_1$ mm | $d_2$ mm | L mm | l mm | N° Art. | € |
|---|---|---|---|---|---|---|
| **40** | **16** | 38 | 40 | 17 | 59945 | **110,46** |
| **40** | **22** | 48 | 45 | 19 | 59946 | **110,46** |
| **40** | **27** | 58 | 50 | 21 | 59947 | **114,26** |
| **40** | **32** | 63 | 50 | 24 | 59948 | **121,89** |
| **40** | **40** | 73 | 55 | 27 | 59949 | **144,73** |
| **50** | **16** | 38 | 55 | 17 | 59950 | **167,60** |
| **50** | **22** | 48 | 55 | 19 | 59951 | **167,60** |
| **50** | **27** | 58 | 60 | 21 | 59952 | **167,60** |
| **50** | **32** | 78 | 60 | 24 | 59954 | **167,60** |
| **50** | **40** | 88 | 65 | 27 | 59955 | **190,46** |

# PINZAS DE SUJECIÓN ER PARA PORTAHERRAMIENTAS

New!

## ER Collets for Tool-Holders

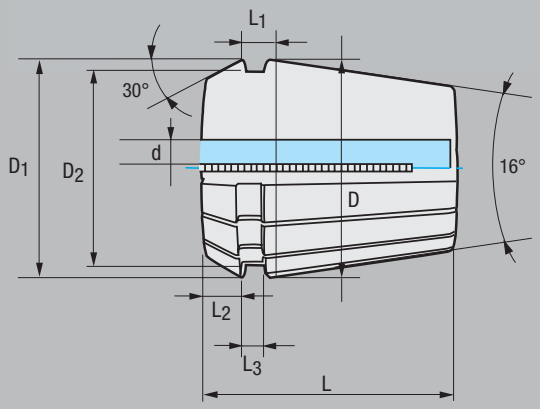
## Pinces ER pour les porte-outils

Ref. 8390
**ULTRAPRECISIÓN**

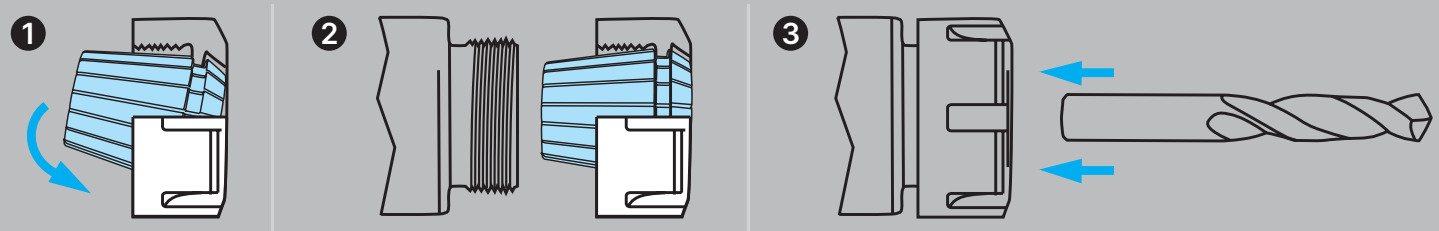
**P**
**↗ 0,005**

Ref. 8391
**ALTA PRECISIÓN**

**A**
**↗ 0,01**




| TIPO Type Type | d | D | D1 | D2 | L | L1 | L2 | L3 | Compresión elástica Elastic compression Compression élastique |
|---|---|---|---|---|---|---|---|---|---|
| ER11 | 1,0-7,0 | 11,50 | 11,50 | 9,50 | 18,00 | 3,80 | 2,50 | 2,00 | 0,50 |
| ER16 | 1,0-2,5 | 16,00 | 17,00 | 13,80 | 27,50 | 6,26 | 4,00 | 2,70 | 0,50 |
| | >2,5-10,0 | 16,00 | 17,00 | 13,80 | 27,50 | 6,26 | 4,00 | 2,70 | 1,00 |
| ER20 | 2,0-2,5 | 20,00 | 21,00 | 17,40 | 31,50 | 6,36 | 4,80 | 2,80 | 0,50 |
| | >2,5-13,0 | 20,00 | 21,00 | 17,40 | 31,50 | 6,36 | 4,80 | 2,80 | 1,00 |
| ER25 | 2,0-2,5 | 25,00 | 26,00 | 22,00 | 34,00 | 6,66 | 5,00 | 3,10 | 0,50 |
| | >2,5-16,0 | 25,00 | 26,00 | 22,00 | 34,00 | 6,66 | 5,00 | 3,10 | 1,00 |
| ER32 | >3,0-20,0 | 32,00 | 33,00 | 29,20 | 40,00 | 7,16 | 5,50 | 3,60 | 1,00 |
| ER40 | 3,0-26,0 | 40,00 | 41,00 | 36,20 | 46,00 | 7,66 | 7,00 | 4,10 | 1,00 |




### COLOCACIÓN DE LA HERRAMIENTA

**❶ Colocar la pinza ER en la tuerca ER**
**❷ Bloquear la pinza ER y la tuerca ER en el porta**
**❸ Insertar la herramienta en la pinza ER y luego apretar la tuerca**

### TOOL INSTALATION

**❶ Put the ER collet into the ER nut**
**❷ Lock the ER collet and the ER nut into the holder**
**❸ Insert the tool into the ER collet and then tighten the nut**

### MISE EN PLACE DE L'OUTIL

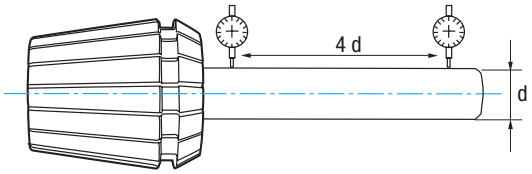
❶ Mettez la pince ER dans l'écrou ER
❷ Verrouillez la pince ER et l'écrou ER dans le porte-outil
❸ Insérez l'outil dans la pince ER puis serrez l'écrou

# Ref. 8390

## PINZAS DE SUJECIÓN ER DE ULTRAPRECISIÓN
## Ultra Precision ER Collets
## Pinces de fixation ER ultraprécision

New!

| Clase Class Classe | Tol. | DIN |
|---|---|---|
| P | ↗ 0,005 mm | 6499 B |




| TIPO Type Type | RANGO Range Intervalle | N° Art. | € |
|---|---|---|---|
| **ER11** | | | |
| **ER11-1** | 1,0-0,5 | 22134 | **56,33** |
| **ER11-1.5** | 1,5-1,0 | 22135 | **56,33** |
| **ER11-2** | 2,0-1,5 | 22136 | **56,33** |
| **ER11-2.5** | 2,5-2,0 | 22137 | **56,33** |
| **ER11-3** | 3,0-2,5 | 22138 | **56,33** |
| **ER11-3.5** | 3,5-3,0 | 22139 | **56,33** |
| **ER11-4** | 4,0-3,5 | 22141 | **56,33** |
| **ER11-4.5** | 4,5-4,0 | 22147 | **56,33** |
| **ER11-5** | 5,0-4,5 | 22148 | **56,33** |
| **ER11-5.5** | 5,5-5,0 | 22149 | **56,33** |
| **ER11-6** | 6,0-5,5 | 22152 | **56,33** |
| **ER11-6.5** | 6,5-6,0 | 22153 | **56,33** |
| **ER11-7** | 7,0-6,5 | 22157 | **56,33** |
| **ER16** | | | |
| **ER16-1** | 1,0-0,5 | 22158 | **51,59** |
| **ER16-2** | 2,0-1,5 | 22159 | **51,59** |
| **ER16-3** | 3,0-2,0 | 22160 | **51,59** |
| **ER16-4** | 4,0-3,0 | 22161 | **51,59** |
| **ER16-5** | 5,0-4,0 | 22163 | **51,59** |
| **ER16-6** | 6,0-5,0 | 22164 | **51,59** |
| **ER16-7** | 7,0-6,0 | 22165 | **51,59** |
| **ER16-8** | 8,0-7,0 | 22166 | **51,59** |
| **ER16-9** | 9,0-8,0 | 22167 | **51,59** |
| **ER16-10** | 10,0-9,0 | 22168 | **51,59** |
| **ER20** | | | |
| **ER20-2** | 2,0-1,5 | 22169 | **51,59** |
| **ER20-3** | 3,0-2,0 | 22170 | **51,59** |
| **ER20-4** | 4,0-3,0 | 22171 | **51,59** |
| **ER20-5** | 5,0-4,0 | 22172 | **51,59** |
| **ER20-6** | 6,0-5,0 | 22173 | **51,59** |
| **ER20-7** | 7,0-6,0 | 22174 | **51,59** |
| **ER20-8** | 8,0-7,0 | 22175 | **51,59** |
| **ER20-9** | 9,0-8,0 | 22176 | **51,59** |
| **ER20-10** | 10,0-9,0 | 22177 | **51,59** |
| **ER20-11** | 11,0-10,0 | 22178 | **51,59** |
| **ER20-12** | 12,0-11,0 | 22179 | **51,59** |
| **ER20-13** | 13,0-12,0 | 22180 | **51,59** |

| TIPO Type Type | RANGO Range Intervalle | N° Art. | € |
|---|---|---|---|
| **ER25** | | | |
| **ER25-2** | 2,0-1,5 | 22185 | **53,96** |
| **ER25-3** | 3,0-2,0 | 22186 | **53,96** |
| **ER25-4** | 4,0-3,0 | 22187 | **53,96** |
| **ER25-5** | 5,0-4,0 | 22188 | **53,96** |
| **ER25-6** | 6,0-5,0 | 22189 | **53,96** |
| **ER25-7** | 7,0-6,0 | 22190 | **53,96** |
| **ER25-8** | 8,0-7,0 | 22195 | **53,96** |
| **ER25-9** | 9,0-8,0 | 22196 | **53,96** |
| **ER25-10** | 10,0-9,0 | 22197 | **53,96** |
| **ER25-11** | 11,0-10,0 | 22198 | **53,96** |
| **ER25-12** | 12,0-11,0 | 22200 | **53,96** |
| **ER25-13** | 13,0-12,0 | 22201 | **53,96** |
| **ER25-14** | 14,0-13,0 | 22202 | **53,96** |
| **ER25-15** | 15,0-14,0 | 22203 | **53,96** |
| **ER25-16** | 16,0-15,0 | 22204 | **53,96** |
| **ER32** | | | |
| **ER32-3** | 3,0-2,0 | 22206 | **56,33** |
| **ER32-4** | 4,0-3,0 | 22208 | **56,33** |
| **ER32-5** | 5,0-4,0 | 22209 | **56,33** |
| **ER32-6** | 6,0-5,0 | 22210 | **56,33** |
| **ER32-7** | 7,0-6,0 | 22219 | **56,33** |
| **ER32-8** | 8,0-7,0 | 22225 | **56,33** |
| **ER32-9** | 9,0-8,0 | 22230 | **56,33** |
| **ER32-10** | 10,0-9,0 | 22231 | **56,33** |
| **ER32-11** | 11,0-10,0 | 22253 | **56,33** |
| **ER32-12** | 12,0-11,0 | 22259 | **56,33** |
| **ER32-13** | 13,0-12,0 | 22276 | **56,33** |
| **ER32-14** | 14,0-13,0 | 22277 | **56,33** |
| **ER32-15** | 15,0-14,0 | 22279 | **56,33** |
| **ER32-16** | 16,0-15,0 | 22282 | **56,33** |
| **ER32-17** | 17,0-16,0 | 22285 | **56,33** |
| **ER32-18** | 18,0-17,0 | 22286 | **56,33** |
| **ER32-19** | 19,0-18,0 | 22287 | **56,33** |
| **ER32-20** | 20,0-19,0 | 22290 | **56,33** |

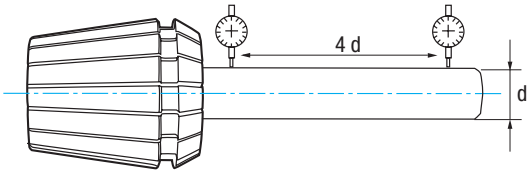
| TIPO Type Type | RANGO Range Intervalle | N° Art. | € |
|---|---|---|---|
| **ER40** | | | |
| **ER40-3** | 3,0-2,0 | 22291 | **65,04** |
| **ER40-4** | 4,0-3,0 | 22292 | **65,04** |
| **ER40-5** | 5,0-4,0 | 22295 | **65,04** |
| **ER40-6** | 6,0-5,0 | 22305 | **65,04** |
| **ER40-7** | 7,0-6,0 | 22310 | **65,04** |
| **ER40-8** | 8,0-7,0 | 22313 | **65,04** |
| **ER40-9** | 9,0-8,0 | 22314 | **65,04** |
| **ER40-10** | 10,0-9,0 | 22316 | **65,04** |
| **ER40-11** | 11,0-10,0 | 22318 | **65,04** |
| **ER40-12** | 12,0-11,0 | 22319 | **65,04** |
| **ER40-13** | 13,0-12,0 | 22333 | **65,04** |
| **ER40-14** | 14,0-13,0 | 22335 | **65,04** |
| **ER40-15** | 15,0-14,0 | 22338 | **65,04** |
| **ER40-16** | 16,0-15,0 | 22339 | **65,04** |
| **ER40-17** | 17,0-16,0 | 22345 | **65,04** |
| **ER40-18** | 18,0-17,0 | 22355 | **65,04** |
| **ER40-19** | 19,0-18,0 | 22356 | **65,04** |
| **ER40-20** | 20,0-19,0 | 22357 | **65,04** |
| **ER40-21** | 21,0-20,0 | 22358 | **65,04** |
| **ER40-22** | 22,0-21,0 | 22359 | **65,04** |
| **ER40-23** | 23,0-22,0 | 22360 | **65,04** |
| **ER40-24** | 24,0-23,0 | 22361 | **65,04** |
| **ER40-25** | 25,0-24,0 | 22362 | **65,04** |
| **ER40-26** | 26,0-25,0 | 23033 | **65,04** |

# Ref. 8391

## PINZAS DE SUJECIÓN ER DE ALTA PRECISIÓN
## High Precision ER Collets
## Pinces de fixation ER haute précision

New!

| Clase Class Classe | Tol. | DIN |
|---|---|---|
| A | ↗ 0,01 mm | 6499 B |




| TIPO Type Type | RANGO Range Intervalle | N° Art. | € |
|---|---|---|---|
| **ER11** | | | |
| **ER11-1** | 1,0-0,5 | 22363 | **36,30** |
| **ER11-1.5** | 1,5-1,0 | 22364 | **36,30** |
| **ER11-2** | 2,0-1,5 | 22366 | **36,30** |
| **ER11-2.5** | 2,5-2,0 | 22367 | **36,30** |
| **ER11-3** | 3,0-2,5 | 22368 | **36,30** |
| **ER11-3.5** | 3,5-3,0 | 22369 | **36,30** |
| **ER11-4** | 4,0-3,5 | 22375 | **36,30** |
| **ER11-4.5** | 4,5-4,0 | 22376 | **36,30** |
| **ER11-5** | 5,0-4,5 | 22377 | **36,30** |
| **ER11-5.5** | 5,5-5,0 | 22378 | **36,30** |
| **ER11-6** | 6,0-5,5 | 22379 | **36,30** |
| **ER11-6.5** | 6,5-6,0 | 22380 | **36,30** |
| **ER11-7** | 7,0-6,5 | 22381 | **36,30** |
| **ER16** | | | |
| **ER16-1** | 1,0-0,5 | 22382 | **33,40** |
| **ER16-2** | 2,0-1,5 | 22383 | **33,40** |
| **ER16-3** | 3,0-2,0 | 22384 | **33,40** |
| **ER16-4** | 4,0-3,0 | 22385 | **33,40** |
| **ER16-5** | 5,0-4,0 | 22386 | **33,40** |
| **ER16-6** | 6,0-5,0 | 22387 | **33,40** |
| **ER16-7** | 7,0-6,0 | 22388 | **33,40** |
| **ER16-8** | 8,0-7,0 | 22390 | **33,40** |
| **ER16-9** | 9,0-8,0 | 22393 | **33,40** |
| **ER16-10** | 10,0-9,0 | 22394 | **33,40** |
| **ER20** | | | |
| **ER20-2** | 2,0-1,5 | 22396 | **33,40** |
| **ER20-3** | 3,0-2,0 | 22397 | **33,40** |
| **ER20-4** | 4,0-3,0 | 22398 | **33,40** |
| **ER20-5** | 5,0-4,0 | 22399 | **33,40** |
| **ER20-6** | 6,0-5,0 | 22401 | **33,40** |
| **ER20-7** | 7,0-6,0 | 22402 | **33,40** |
| **ER20-8** | 8,0-7,0 | 22403 | **33,40** |
| **ER20-9** | 9,0-8,0 | 22404 | **33,40** |
| **ER20-10** | 10,0-9,0 | 22409 | **33,40** |
| **ER20-11** | 11,0-10,0 | 22411 | **33,40** |
| **ER20-12** | 12,0-11,0 | 22412 | **33,40** |
| **ER20-13** | 13,0-12,0 | 22414 | **33,40** |

| TIPO Type Type | RANGO Range Intervalle | N° Art. | € |
|---|---|---|---|
| **ER25** | | | |
| **ER25-2** | 2,0-1,5 | 22415 | **35,10** |
| **ER25-3** | 3,0-2,0 | 22416 | **35,10** |
| **ER25-4** | 4,0-3,0 | 22422 | **35,10** |
| **ER25-5** | 5,0-4,0 | 22424 | **35,10** |
| **ER25-6** | 6,0-5,0 | 22426 | **35,10** |
| **ER25-7** | 7,0-6,0 | 22427 | **35,10** |
| **ER25-8** | 8,0-7,0 | 22428 | **35,10** |
| **ER25-9** | 9,0-8,0 | 22433 | **35,10** |
| **ER25-10** | 10,0-9,0 | 22434 | **35,10** |
| **ER25-11** | 11,0-10,0 | 22435 | **35,10** |
| **ER25-12** | 12,0-11,0 | 22437 | **35,10** |
| **ER25-13** | 13,0-12,0 | 22439 | **35,10** |
| **ER25-14** | 14,0-13,0 | 22440 | **35,10** |
| **ER25-15** | 15,0-14,0 | 22442 | **35,10** |
| **ER25-16** | 16,0-15,0 | 22443 | **35,10** |
| **ER32** | | | |
| **ER32-3** | 3,0-2,0 | 22444 | **36,30** |
| **ER32-4** | 4,0-3,0 | 22445 | **36,30** |
| **ER32-5** | 5,0-4,0 | 22446 | **36,30** |
| **ER32-6** | 6,0-5,0 | 22447 | **36,30** |
| **ER32-7** | 7,0-6,0 | 22452 | **36,30** |
| **ER32-8** | 8,0-7,0 | 22453 | **36,30** |
| **ER32-9** | 9,0-8,0 | 22454 | **36,30** |
| **ER32-10** | 10,0-9,0 | 22455 | **36,30** |
| **ER32-11** | 11,0-10,0 | 22458 | **36,30** |
| **ER32-12** | 12,0-11,0 | 22461 | **36,30** |
| **ER32-13** | 13,0-12,0 | 22462 | **36,30** |
| **ER32-14** | 14,0-13,0 | 22467 | **36,30** |
| **ER32-15** | 15,0-14,0 | 22468 | **36,30** |
| **ER32-16** | 16,0-15,0 | 22469 | **36,30** |
| **ER32-17** | 17,0-16,0 | 22471 | **36,30** |
| **ER32-18** | 18,0-17,0 | 22476 | **36,30** |
| **ER32-19** | 19,0-18,0 | 22478 | **36,30** |
| **ER32-20** | 20,0-19,0 | 22479 | **36,30** |

| TIPO Type Type | RANGO Range Intervalle | N° Art. | € |
|---|---|---|---|
| **ER40** | | | |
| **ER40-3** | 3,0-2,0 | 22481 | **41,90** |
| **ER40-4** | 4,0-3,0 | 22482 | **41,90** |
| **ER40-5** | 5,0-4,0 | 22483 | **41,90** |
| **ER40-6** | 6,0-5,0 | 22484 | **41,90** |
| **ER40-7** | 7,0-6,0 | 22487 | **41,90** |
| **ER40-8** | 8,0-7,0 | 22488 | **41,90** |
| **ER40-9** | 9,0-8,0 | 22491 | **41,90** |
| **ER40-10** | 10,0-9,0 | 22498 | **41,90** |
| **ER40-11** | 11,0-10,0 | 22501 | **41,90** |
| **ER40-12** | 12,0-11,0 | 22504 | **41,90** |
| **ER40-13** | 13,0-12,0 | 22505 | **41,90** |
| **ER40-14** | 14,0-13,0 | 22529 | **41,90** |
| **ER40-15** | 15,0-14,0 | 22535 | **41,90** |
| **ER40-16** | 16,0-15,0 | 22538 | **41,90** |
| **ER40-17** | 17,0-16,0 | 22541 | **41,90** |
| **ER40-18** | 18,0-17,0 | 22544 | **41,90** |
| **ER40-19** | 19,0-18,0 | 22561 | **41,90** |
| **ER40-20** | 20,0-19,0 | 22566 | **41,90** |
| **ER40-21** | 21,0-20,0 | 22567 | **41,90** |
| **ER40-22** | 22,0-21,0 | 22569 | **41,90** |
| **ER40-23** | 23,0-22,0 | 22572 | **41,90** |
| **ER40-24** | 24,0-23,0 | 22573 | **41,90** |
| **ER40-25** | 25,0-24,0 | 22575 | **41,90** |
| **ER40-26** | 26,0-25,0 | 22584 | **41,90** |

| Set | Pcs | Cont. | N° Art. | Set Price! |
|---|---|---|---|---|
| **ER11** | 13 | **1 - 1,5 - 2 - 2,5 - 3 - 3,5 - 4 - 4,5 - 5 - 5,5 - 6 - 6,5 - 7** | 24563 | **448,31** |
| **ER16** | 10 | **1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10** | 24571 | **317,30** |
| **ER20** | 12 | **2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13** | 24575 | **380,76** |
| **ER25** | 15 | **2 - 3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16** | 24579 | **500,18** |

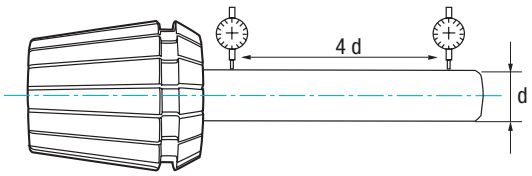
| Set | Pcs | Cont. | N° Art. | Set Price! |
|---|---|---|---|---|
| **ER32** | 18 | **3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 - 20** | 24584 | **620,73** |
| **ER40** | 24 | **3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 - 20 - 21 - 22 - 23 - 24 - 25 - 26** | 24590 | **955,32** |

# Ref. 8392

## PINZAS DE SUJECIÓN ESTANCAS ERC DE ALTA PRECISIÓN
## High Precision ERC Sealing Collets
## Pinces de fixation ERC haute précision

New!

| Clase Class Classe | Tol. | DIN |
|---|---|---|
| A | ↗ 0,01 mm | 6499 B |




| TIPO Type Type | RANGO Range Intervalle | N° Art. | € |
|---|---|---|---|
| **ERC16** | | | |
| **ERC16-3** | 3 | 83932 | **37,38** |
| **ERC16-4** | 4 | 83933 | **37,38** |
| **ERC16-5** | 5 | 83934 | **37,38** |
| **ERC16-6** | 6 | 83935 | **37,38** |
| **ERC16-7** | 7 | 83936 | **37,38** |
| **ERC16-8** | 8 | 83937 | **37,38** |
| **ERC16-9** | 9 | 83938 | **37,38** |
| **ERC16-10** | 10 | 83939 | **37,38** |
| **ERC20** | | | |
| **ERC20-3** | 3 | 83940 | **39,29** |
| **ERC20-4** | 4 | 83941 | **39,29** |
| **ERC20-5** | 5 | 83942 | **39,29** |
| **ERC20-6** | 6 | 83943 | **39,29** |
| **ERC20-7** | 7 | 83944 | **39,29** |
| **ERC20-8** | 8 | 83945 | **39,29** |
| **ERC20-9** | 9 | 83946 | **39,29** |
| **ERC20-10** | 10 | 83947 | **39,29** |
| **ERC20-11** | 11 | 83948 | **39,29** |
| **ERC20-12** | 12 | 83949 | **39,29** |
| **ERC20-13** | 13 | 83950 | **39,29** |

| TIPO Type Type | RANGO Range Intervalle | N° Art. | € |
|---|---|---|---|
| **ERC25** | | | |
| **ERC25-3** | 3 | 83951 | **41,25** |
| **ERC25-4** | 4 | 83952 | **41,25** |
| **ERC25-5** | 5 | 83953 | **41,25** |
| **ERC25-6** | 6 | 83954 | **41,25** |
| **ERC25-7** | 7 | 83955 | **41,25** |
| **ERC25-8** | 8 | 83956 | **41,25** |
| **ERC25-9** | 9 | 83957 | **41,25** |
| **ERC25-10** | 10 | 83958 | **41,25** |
| **ERC25-11** | 11 | 83959 | **41,25** |
| **ERC25-12** | 12 | 83960 | **41,25** |
| **ERC25-13** | 13 | 83961 | **41,25** |
| **ERC25-14** | 14 | 83962 | **41,25** |
| **ERC25-15** | 15 | 83963 | **41,25** |
| **ERC25-16** | 16 | 83964 | **41,25** |
| **ERC32** | | | |
| **ERC32-3** | 3 | 83965 | **42,56** |
| **ERC32-4** | 4 | 83966 | **42,56** |
| **ERC32-5** | 5 | 83967 | **42,56** |
| **ERC32-6** | 6 | 83925 | **42,56** |
| **ERC32-7** | 7 | 83968 | **42,56** |
| **ERC32-8** | 8 | 83969 | **42,56** |
| **ERC32-9** | 9 | 83970 | **42,56** |
| **ERC32-10** | 10 | 83971 | **42,56** |
| **ERC32-11** | 11 | 83972 | **42,56** |
| **ERC32-12** | 12 | 83973 | **42,56** |
| **ERC32-13** | 13 | 83974 | **42,56** |
| **ERC32-14** | 14 | 83975 | **42,56** |
| **ERC32-15** | 15 | 83976 | **42,56** |
| **ERC32-16** | 16 | 83977 | **42,56** |
| **ERC32-17** | 17 | 83978 | **42,56** |
| **ERC32-18** | 18 | 83979 | **42,56** |
| **ERC32-19** | 19 | 83980 | **42,56** |
| **ERC32-20** | 20 | 83981 | **42,56** |

| TIPO Type Type | RANGO Range Intervalle | N° Art. | € |
|---|---|---|---|
| **ERC40** | | | |
| **ERC40-3** | 3 | 83982 | **45,83** |
| **ERC40-4** | 4 | 83983 | **45,83** |
| **ERC40-5** | 5 | 83984 | **45,83** |
| **ERC40-6** | 6 | 83985 | **45,83** |
| **ERC40-7** | 7 | 83986 | **45,83** |
| **ERC40-8** | 8 | 83987 | **45,83** |
| **ERC40-9** | 9 | 83988 | **45,83** |
| **ERC40-10** | 10 | 83989 | **45,83** |
| **ERC40-11** | 11 | 83990 | **45,83** |
| **ERC40-12** | 12 | 83991 | **45,83** |
| **ERC40-13** | 13 | 83992 | **45,83** |
| **ERC40-14** | 14 | 83993 | **45,83** |
| **ERC40-15** | 15 | 83994 | **45,83** |
| **ERC40-16** | 16 | 83995 | **45,83** |
| **ERC40-17** | 17 | 83996 | **45,83** |
| **ERC40-18** | 18 | 83997 | **45,83** |
| **ERC40-19** | 19 | 83998 | **45,83** |
| **ERC40-20** | 20 | 83999 | **45,83** |
| **ERC40-21** | 21 | 84000 | **45,83** |
| **ERC40-22** | 22 | 84001 | **45,83** |
| **ERC40-23** | 23 | 84002 | **45,83** |
| **ERC40-24** | 24 | 84003 | **45,83** |
| **ERC40-25** | 25 | 84004 | **45,83** |
| **ERC40-26** | 26 | 84005 | **45,83** |

| Set | Pcs | Cont. | N° Art. | Set Price! |
|---|---|---|---|---|
| **ERC16** | 8 | **3 - 4 - 5 - 6 - 7 - 8 - 9 - 10** | 84006 | **284,09** |
| **ERC20** | 11 | **3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13** | 84007 | **410,58** |
| **ERC25** | 14 | **3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16** | 84008 | **548,63** |

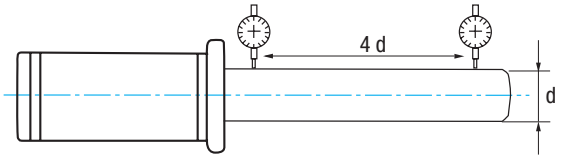
| Set | Pcs | Cont. | N° Art. | Set Price! |
|---|---|---|---|---|
| **ERC32** | 18 | **3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 - 20** | 84009 | **727,63** |
| **ERC40** | 24 | **3 - 4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 - 20 - 21 - 22 - 23 - 24 - 25 - 26** | 84010 | **1.044,92** |

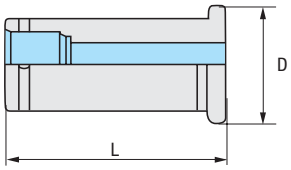
# Ref. 8395

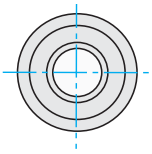
## PINZAS DE SUJECIÓN DE GRAN APRIETE DE ALTA PRECISIÓN
## High Precision Strong Collets
## Pinces de fixation de grand serrage haute précision

New!

| Clase Class Classe | Tol. |
|---|---|
| A | ↗ 0,01 mm |



| TIPO Type Type | MEDIDA Size Mesure | D | L |
|---|---|---|---|
| C20 | 6, 8, 10, 12, 16 | 26,00 | 55,00 |
| C25 | 6, 8, 10, 12, 16, 20 | 30,00 | 63,00 |
| C32 | 4, 5, 6, 8, 10, 12, 14, 16, 18, 20, 25 | 38,00 | 70,00 |
| C42 | 6, 8, 10, 12, 16, 20, 25, 32 | 48,00 | 75,00 |

| TIPO Type Type | N° Art. | € |
|---|---|---|
| **C20** | | |
| C20-6 | 25195 | 49,80 |
| C20-8 | 25202 | 49,80 |
| C20-10 | 25205 | 49,80 |
| C20-12 | 25209 | 49,80 |
| C20-16 | 25210 | 49,80 |

| TIPO Type Type | N° Art. | € |
|---|---|---|
| **C25** | | |
| C25-6 | 25212 | 49,80 |
| C25-8 | 25213 | 49,80 |
| C25-10 | 25214 | 49,80 |
| C25-12 | 25215 | 49,80 |
| C25-16 | 25216 | 49,80 |
| C25-20 | 25223 | 49,80 |

| TIPO Type Type | N° Art. | € |
|---|---|---|
| **C32** | | |
| C32-4 | 25225 | 49,80 |
| C32-5 | 25232 | 49,80 |
| C32-6 | 25236 | 49,80 |
| C32-8 | 25238 | 49,80 |
| C32-10 | 25239 | 49,80 |
| C32-12 | 25240 | 49,80 |
| C32-14 | 25241 | 49,80 |
| C32-16 | 25242 | 49,80 |
| C32-18 | 25243 | 49,80 |
| C32-20 | 25244 | 49,80 |
| C32-25 | 25245 | 49,80 |

| TIPO Type Type | N° Art. | € |
|---|---|---|
| **C42** | | |
| C42-6 | 25246 | 59,76 |
| C42-8 | 25247 | 59,76 |
| C42-10 | 25248 | 59,76 |
| C42-12 | 25249 | 59,76 |
| C42-16 | 25250 | 59,76 |
| C42-20 | 25251 | 59,76 |
| C42-25 | 25252 | 59,76 |
| C42-32 | 25254 | 59,76 |

| Set | Pcs | Cont. | N° Art. | Set Price! |
|---|---|---|---|---|
| C20 | 5 | 6 - 8 - 10 - 12 - 16 | 25302 | 236,55 |
| C32 | 11 | 4 - 5 - 6 - 8 - 10 - 12 - 14 - 16 - 18 - 20 - 25 | 25300 | 520,41 |

Ref. 8391

Ref. 8395

# Top Quality Raw Materials

izartool.com/en

# 12.

# ACEITES DE CORTE Y REFRIGERANTES

## Cutting Oils & Water Soluble Fluids

## Huiles de coupe et lubrifiants


**ACEITES DE CORTE**
Cutting Oils
Huiles de coupe 651

**PASTA DE CORTE**
Cutting Paste
Pâte de coupe 654

**CERA DE CORTE**
Cutting Wax
Cire de coupe 654

**REFRIGERANTES - TALADRINA**
Water Soluble Fluids
Lubrifiants 655

IZAR CUTTING TOOLS

Ref. 3415

New!

# ACEITES DE CORTE Y REFRIGERANTES
## Cutting Oils & Water Soluble Fluids
## Huiles de coupe et lubrifiants

### ACEITES DE CORTE

**Aceite de corte de uso general de alta gama, formulado a base de aceites vegetales y libre de cloruros. Para aplicaciones de corte en general (taladrado, roscado, fresado, torneado, etc.)**

### Cutting Oils

High-end general purpose cutting oil, formulated from vegetable oils and chloride-free. For general cutting applications (drilling, threading, milling, turning, etc.)

### Huiles de coupe

Huile de coupe à usage général haut de gamme, formulée à base d'huiles végétales et sans chlorures. Pour des applications de coupe en général (perçage, taraudage, fraisage, tournage, etc.).

### REFRIGERANTES - TALADRINA

**Aceite emulsionable altamente concentrado libre de cloruros, aminas secundarias y / o nitritos**

### Water Soluble Fluids

Highly concentrated emulsifiable oil free of chlorides, secondary amines and/or nitrites

### Lubrifiants

Huile émulsifiable hautement concentrée, exempte de chlorures, d'amines secondaires et/ou de nitrites

# ACEITES DE CORTE
## Cutting Oils - Huiles de coupe

## UNI
New!

Universal

**Viscosidad a 40°C**
Viscosity / Viscosité:
**37 cSt**

No Soluble

*** Disponible Ficha Técnica**
* Data Sheet available
* Fiche technique disponible

**APLICACIÓN:**
**Para aplicaciones de uso general y universal (UNI) en todos los metales ferrosos.**

APPLICATION:
For general purpose and universal (UNI) applications on all ferrous metals.

APPLICATION:
Pour des applications à usage général et universel (UNI) sur tous les métaux ferreux.

| Cont. | 250 ml |
|---|---|
| Nº Art. | 53898 |
| € | 9,11 |

| Cont. | 500 ml |
|---|---|
| Nº Art. | 53901 |
| € | 12,31 |

| Cont. | 1L |
|---|---|
| Nº Art. | 53903 |
| € | 28,16 |

| Cont. | 5L |
|---|---|
| Nº Art. | 53904 |
| € | 98,41 |

| Cont. | 10L |
|---|---|
| Nº Art. | 53906 |
| € | 180,56 |

| Cont. | 25L |
|---|---|
| Nº Art. | 53907 |
| € | 354,70 |

## INOX
New!

Heavy Duty

VISCOSIDAD EXTRA !
Extra Viscosity!
Viscosité supplémentaire !

**Viscosidad a 40°C**
Viscosity / Viscosité:
**173 cSt**

No Soluble

*** Disponible Ficha Técnica**
* Data Sheet available
* Fiche technique disponible

**APLICACIÓN:**
**Para aplicaciones de mecanizado pesado (Heavy Duty) en todos los metales ferrosos y para un rendimiento mejorado en aceros inoxidables (INOX).**

APPLICATION:
For heavy duty machining applications on all ferrous metals and for improved performance on stainless steels (STAINLESS).

APPLICATION:
Pour des applications d'usinage lourd (Heavy Duty) sur tous les métaux ferreux et pour améliorer les performances sur les aciers inoxydables (INOX).

| Cont. | 250 ml |
|---|---|
| Nº Art. | 53928 |
| € | 13,97 |

| Cont. | 500 ml |
|---|---|
| Nº Art. | 53934 |
| € | 24,88 |

| Cont. | 1L |
|---|---|
| Nº Art. | 53936 |
| € | 43,71 |

| Cont. | 5L |
|---|---|
| Nº Art. | 53937 |
| € | 156,90 |

| Cont. | 10L |
|---|---|
| Nº Art. | 53940 |
| € | 299,14 |

| Cont. | 25L |
|---|---|
| Nº Art. | 53942 |
| € | 648,16 |

# ALU

New!

Non Ferrous

**Viscosidad a 40°C**
Viscosity / Viscosité:
**4,20 cSt**

No Soluble

*** Disponible Ficha Técnica**
* Data Sheet available
* Fiche technique disponible

**APLICACIÓN:**
**Especial para aplicaciones en todos los metales no ferrosos como aluminio (ALU), cobre, latón, bronce, zinc**

APPLICATION:
Specially for applications on all non-ferrous metals such as aluminium (ALU), copper, brass, bronze, zinc, etc.

APPLICATION:
Spécialement indiqué pour les applications sur tous les métaux non ferreux, tels que l'aluminium (ALU), le cuivre, le laiton, le bronze, le zinc, etc.

| Cont. | 250 ml |
|---|---|
| Nº Art. | 53943 |
| € | 12,60 |

| Cont. | 500 ml |
|---|---|
| Nº Art. | 53946 |
| € | 20,56 |

| Cont. | 1L |
|---|---|
| Nº Art. | 53948 |
| € | 34,42 |

| Cont. | 5L |
|---|---|
| Nº Art. | 53949 |
| € | 127,38 |

| Cont. | 25L |
|---|---|
| Nº Art. | 79042 |
| € | 580,19 |

## New! DISPLAYS

9×250ml
**UNI**

| Nº Art. | € Set Price! |
|---|---|
| 13929 | 77,89 |

**UNI+INOX+ALU**
3+3+3×250ml
**MIXTO**

| Nº Art. | € Set Price! |
|---|---|
| 13930 | 101,69 |

6×400ml
**AEROSOL**

| Nº Art. | € Set Price! |
|---|---|
| 13912 | 89,32 |

# New! AEROSOL - Aerosol - Aérosol

**2 Cánulas** / 2 Nozzles / 2 Canules

**Chorro líquido**
Liquid jet
Jet liquide

| Cont. | 400ml |
|---|---|
| Nº Art. | 53900 |
| € | 15,67 |

**Spray**

**Para aplicaciones de uso general en todos los metales ferrosos**
For general purpose applications on all ferrous metals
Pour des applications à usage général sur tous les métaux ferreux

**12 UNI**

| Nº Art. | € Box Price! |
|---|---|
| 53926 | 178,64 |

# New! ESPUMA - Foam - Mousse

**Fuerte adhesión sin goteos. Lavable con agua**
Strong adherence without drips. Washable with water
Forte adhérence sans gouttes. Lavable à l'eau

| Cont. | 400ml |
|---|---|
| Nº Art. | 48302 |
| € | 20,41 |

**12 UNI**

| Nº Art. | € Box Price! |
|---|---|
| 48299 | 232,67 |

# New! MULTI

## Multiusos

**Multiusos** - Multi-purpose - Multifonction

| Cont. | 400ml |
|---|---|
| Nº Art. | 84040 |
| € | 14,55 |

**Pulveriza abiertamente con la cánula hacia abajo**
Spray openly with the nozzle facing down
Vaporise ouvertement avec la canule vers le bas

**Pulveriza con precisión con la cánula hacia arriba**
Spray precisely with the nozzle facing up
Vaporise précisément avec la canule vers le haut

**APLICACIÓN:**

**Mecanizado de aceros duros, inoxidables, aleaciones de cobre y toda clase de metales**

**Fuertemente aditivado para lubricar y proteger contra la corrosión**

APPLICATION:

Machining of hard steels, stainless steels, copper alloys and all kinds of metals

Highly additivated for lubrication and corrosion protection

APPLICATION:

Usinage d'aciers durs, inoxydables, alliages de cuivre et tous types de métaux

Fortement additivé pour la lubrification et la protection contre la corrosion

**12 UNI**

| Nº Art. | € Box Price! |
|---|---|
| 84335 | 165,87 |

# New! PASTA DE CORTE - Cutting Paste - Pâte de coupe

**Pasta con propiedades lubricantes extremas. La pasta se asienta en las aristas de corte y se licua durante la operación de corte.**

**Ideal para todas las operaciones como roscado, taladrado y fresado de materiales difíciles de cortar como acero inoxidable, acero Cr-Ni, titanio, acero al manganeso, etc.**

Paste with extreme lubricating properties. The paste settles on the cutting edges and liquefies during the cutting operation.

Ideal for all operations such as the threading, drilling and milling of difficult-to-cut materials such as stainless steel, Cr-Ni steel, titanium, manganese steel, etc.

Pâte aux propriétés lubrifiantes extrêmes. La pâte se dépose sur les bords de coupe et se liquéfie pendant l'opération de coupe.

Idéale pour toutes les opérations telles que le taraudage, le perçage et le fraisage de matériaux difficiles à couper comme l'acier inoxydable, l'acier Cr-Ni, le titane, l'acier au manganèse, etc.

| Cont. | 250ml |
|---|---|
| Nº Art. | 53954 |
| € | 17,20 |

| Cont. | 750ml |
|---|---|
| Nº Art. | 53956 |
| € | 28,64 |

**Sumerja la herramienta de corte en la pasta para obtener resultados optimizados**

Dip the cutting tool into the paste for optimised results

Trempez l'outil de coupe dans la pâte pour des résultats optimisés

# New! CERA DE CORTE - Cutting Wax - Cire de coupe

**Cera en barra de alta gama para refrigerante y lubricación de operaciones de corte en metales no ferrosos como aluminio, cobre, latón, etc. Libre de cloruros, sin humos o vapores nocivos.**

**Para todas las máquinas de hoja de sierra circular o sierra de cinta sin suministro de refrigerante. También apto para fresado, roscado, escariado, taladrado, torneado, etc.**

High-end wax in a bar for the cooling and lubrication of cutting operations on non-ferrous metals such as aluminium, copper, brass, etc. Chloride free, no harmful fumes or vapours.

For all circular or band saw blade machines without coolant supply. Also suitable for milling, threading, reaming, drilling, turning, etc.

Cire en barre haut de gamme pour le refroidissement et la lubrification des opérations de coupe sur les métaux non ferreux tels que l'aluminium, le cuivre, le laiton, etc. Sans chlorures, sans fumées ni vapeurs nocives.

Pour toutes les machines à lame de scie circulaire ou à ruban sans alimentation en réfrigérant. Convient également pour le fraisage, taraudage, alésage, perçage, tournage, etc.

| Cont. | 300ml |
|---|---|
| Nº Art. | 53957 |
| € | 29,95 |

**Para aplicar la cera, sostenga brevemente la barra de cera contra la sierra giratoria. Repita cada 10-20 ciclos de aserrado**

To apply the wax, briefly hold the wax bar against the rotary saw. Repeat every 10-20 sawing cycles

Pour appliquer la cire, maintenez brièvement la barre de cire contre la scie rotative. Répétez tous les 10 à 20 cycles de sciage

# REFRIGERANTES - TALADRINA
## Water Soluble Fluids - Lubrifiants

### STD Standard

New!

**Emulsión semisintética, transparente a semitransparente. Muy alta estabilidad ante los microorganismos. Apto para operaciones de rectificado. Concentración del 4-7% en función de la aplicación.**

Semi-synthetic emulsion, transparent to semi-transparent. Very high stability to micro-organisms. Suitable for grinding operations. Concentration 4-7% depending on the application.

Émulsion semi-synthétique, transparente à semi-transparente. Très grande stabilité face aux microorganismes. Convient pour les opérations de meulage. Concentration de 4-7 % selon l'application.

**Índice Refractómetro**
Refractometer Index
Indice de réfractomètre
**1,60**

* **Disponible Ficha Técnica**
* Data Sheet available
* Fiche technique disponible

**STANDARD**

| Cont. | 5L |
|---|---|
| Nº Art. | 53958 |
| € | 94,75 |

### TOP Top Line

New!

**Emulsión de color blanco lechoso. Para aplicaciones de alto rendimiento en aceros, materiales no ferrosos y aluminio. Concentración 6-10% en función de la aplicación.**

Milky white emulsion. For high performance applications on steels, non-ferrous materials and aluminium. Concentration 6-10% depending on application.

Émulsion blanche laiteuse. Pour des applications de haute performance sur les aciers, les matériaux non ferreux et l'aluminium. Concentration de 6-10 % selon l'application.

**Índice Refractómetro**
Refractometer Index
Indice de réfractomètre
**1,20**

* **Disponible Ficha Técnica**
* Data Sheet available
* Fiche technique disponible

**TOP LINE**

| Cont. | 5L |
|---|---|
| Nº Art. | 53959 |
| € | 111,19 |

IZAR®
CUTTING TOOLS

# Technology & Innovation

izartool.com/en

# 13.

# HERRAMIENTA ESPECIAL

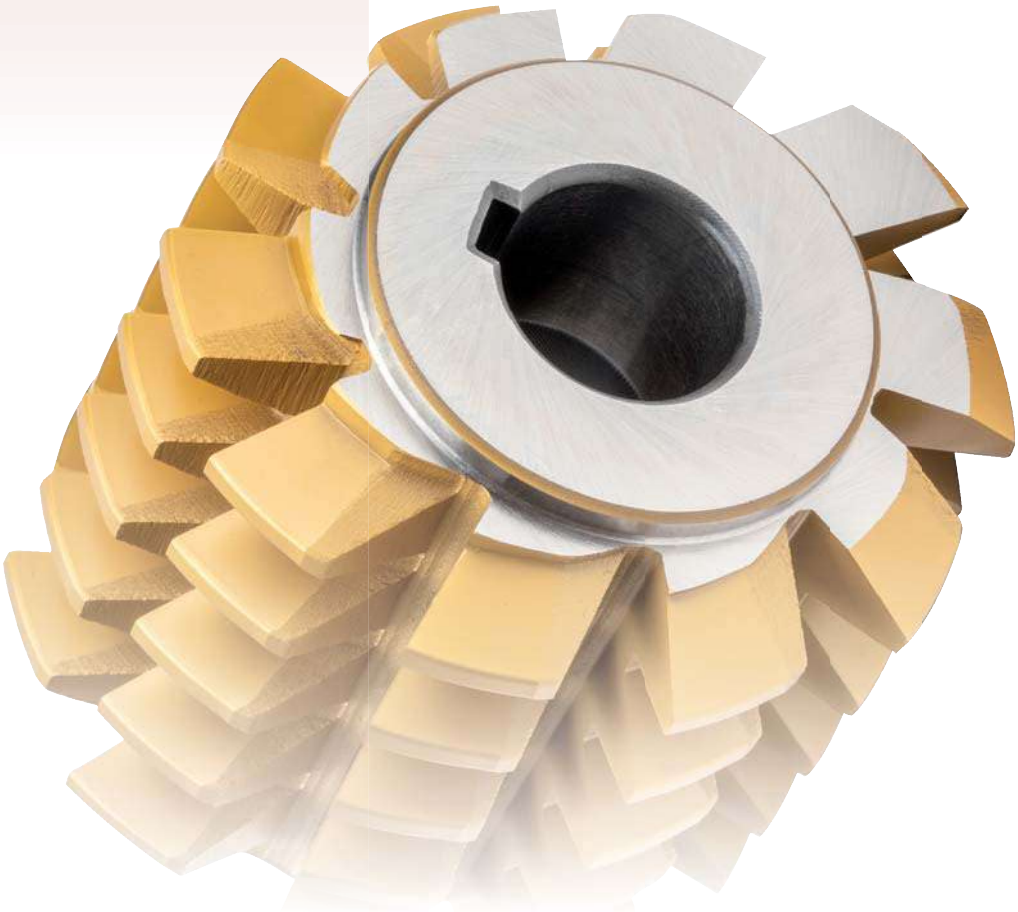
Special Tools

Outils spéciaux

**HERRAMIENTA ESPECIAL. Bajo demanda**

Special Tools. Upon request

Outils spéciaux. Sur demande 657



## FABRICAMOS HERRAMIENTA ESPECIAL BAJO DEMANDA
Special Tools manufactured upon request
On fabrique des outils spéciaux sur demande

**Brocas, Fresas Mango, Fresas Agujero, Fresas Madre...**

**Drill Bits, End Mills, Shank type and Arbor type Milling Cutters, Hobs...**

Forets, Fraises queue cyllindrique, Fraises à trou, Fraises mère...

**Especialmente:**

**Specially:**

Spéciallemment:

**Fresas madre y de disco con perfil constante:**

- **Modulares y d. pitch desde mod. 0,25 hasta mod. 25**
- **Para ejes nervados DIN-5480, DIN-5482...**
- **Para ejes estriados**
- **Para ruedas de cadena**
- **Tallado de coronas**
- **Poleas dentadas**

  *** Calidad hasta AA s/ DIN-3968**

**Form Relieved Single Cutter and Hobs:**

- **Modular and Diametral Pitch system from 0.25 up to 25 mod.**
- **For Involute Spline Shaft DIN 5480, DIN 5482...**
- **For Spline Shaft**
- **For roller chain sprockets**
- **Gear milling cutters**
- **Pulley milling cutters**

  *** Accuracy up to quality class AA according to DIN-3968**

Fraises mère et disque avec profil constant:

- Modulaires et diamètral pitch depuis mod 0.25 jusqu`à mod 25
- Pour arbres nerveux DIN 5480, DIN 5482
- Pour arbres cannelés
- Pour roués à chaine
- Taillage de couronnes
- Poulies dentées

  * Qualité jusqu´à AA s/DIN 3968

**Fresas de disco para tallado de tornillos sin fin y cremalleras.**

**Single cutters for milled Worm and Racks.**

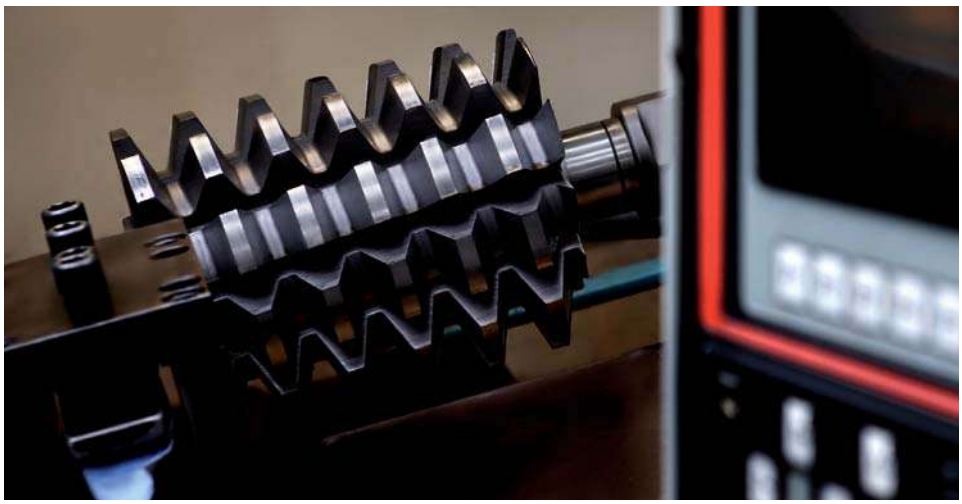
Fraise disque pour taillage de vis et cremaillère.

**Fresas de forma s/plano ajustadas a las necesidades de cada cliente.**

**Single cutters with special profile according to customer preferences and drawings.**

Fraise de forme suivant plan et suivant les besoins de chaque client.

## FABRICAMOS HERRAMIENTA ESPECIAL BAJO DEMANDA
Special Tools manufactured upon request
On fabrique des outils spéciaux sur demande



### Disponemos de Maquinaria:

- **Klingelberg, Reishauer para rectificado de perfiles**
- **Klingelberg, Schutte para afilado pulido**
- **Samputensilli para la comprobación de perfiles de fresas madre**
- **Schneeberger de última generación con 5 ejes controlados**
- **Danobat, rectificadoras de última generación**
- **Otra maquinaria especial**

### We have special and specific technical machinery such as:

- **Profile grinding machines Klingelberg, Reishauer**
- **Sharpening and Polishing machines Klingelberg, Schütte**
- **Samputensili machines for checking profiles**
- **Last generation 5 axes cnc machines Schneeberger**
- **Last generation grinding machines Danobat**
- **Other special machines**

### On dispose du suivant parc machines:

- Kingelberg, Reishauer pour rectifié les profils
- Kingelberg, Schutte pour affutage pouli
- Samputensili pour verification des profils des fraises mères
- Schneeberger de dernière génération avec 5 axes controlés
- Danobat, machines pour rectifier de dernière génération
- Autres machines spéciales

# Reafilado
# Resharpening
# Réaffutage

## Servicio de reafilado:
- Fresas madre
- Fresas de agujero
- Brocas cónicas DIN-345, DIN-341
- Fresas frontales Metal Duro, PMX

**Ofrecemos todo tipo de recubrimientos**

## Resharpening service for:
- Hobs
- Arbor type cutters
- Taper shank drill bits DIN 345, DIN 341
- Carbide and PMX end mills,...

**We offer all kind of coatings**

## Service de réaffutage:
- Fraises mère
- Fraises à trou
- Forets coniques DIN-345, DIN-341
- Forets carbure et ASP

On offer tout genre de revêtements

**+ INFO izartool.com**

# BROCAS ESPECIALES
## Special Drill Bits
## Forets spéciaux

**IZAR CUTTING TOOLS S.A.L.**
Parque Empresarial Boroa 2B2
48340 AMOREBIETA (Bizkaia) - Spain
Tel. +34 94 630 02 43
Fax +34 94 630 05 42
E-mail ibeobide@izartool.com
**izartool.com**

**Cliente**
Customer
Client _____

**Fecha**
Date
Date _____

**Dirección**
Address
Adresse _____

**Ciudad**
Town
Ville _____

**Contacto**
Contact
Contact _____

**Teléfono**
Phone
Téléphone _____

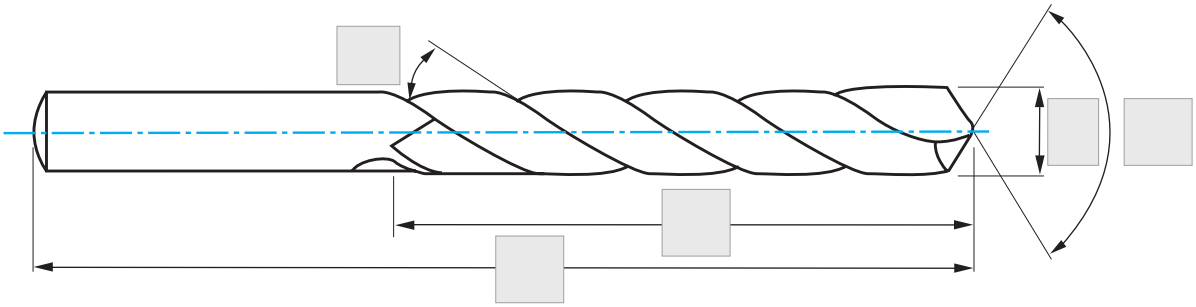
**E-mail**
E-mail
E-mail _____

**Fax**
Fax
Fax _____

**DENOMINACIÓN HERRAMIENTA**
TOOL DENOMINATION
DÉNOMINATION DE L'OUTIL _____

**Cantidad Requerida**
Requested Quantity
Quantité demandée _____

**Similar a Ref. IZAR**
Similar to IZAR Ref.
Similaire à ref. IZAR _____



**FORMA DEL MANGO**
SHANK TYPE
TYPE DE QUEUE

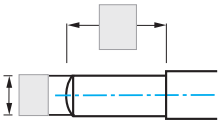
☐ **Liso**
Flat
Plat

**DIN-1809**

☐ **Lengueta**
Tang
Clavette

**DIN-228**

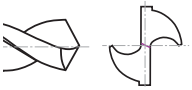
☐ **Cono Morse**
Morse Taper
Cône morse _____



☐ **Rebajado**
Reduced
Baissé

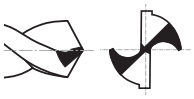
☐ **Otro**
Another one
Autres

**AGUZADO**
SPLIT POINT
AFFUTAGE

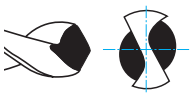


☐ **Sin Aguzar**
Without Split Point
Sans affuter

☐ **Tipo "A"**
"A" Type
Type "A"



☐ **Tipo "C"**
"C" Type
Type "C"



☐ **Tipo "U"**
"U" Type
Type "U"

☐ **Otro**
Another one
Autres

**APLICACIÓN**
APPLICATION
APPLICATION

**Material a Trabajar**
Material to Work
Matériel à travailler _____

**Dureza / Resistencia a la Tracción**
Hardness / Tensile Strength
Dureté / Resistance à la traction _____

**MATERIAL PIEZA**
TOOL MATERIAL
MATÉRIEL DE L'OUTIL

☐ **MD Integral**
HM
Carbure

☐ **MD Plaquita**
Carbide Tipped
Pointe carbure

☐ **HSSE 5% Co**

☐ **HSS**

☐ **Otro**
Another one
Autres

**ACABADO**
FINISH
FINITION

☐ **Blanca**
Bright Finish
Blanche

☐ **Negra**
Blue Finish
Noir

☐ **Ambar**
Gold Finish
Ambre

☐ **Otro**
Another one
Autres

**RECUBRIMIENTO**
COATING
REVÊTEMENT

☐ **TIALSIN**

☐ **CROMAX**

☐ **TIN**

☐ **Otro**
Another one
Autres

# FRESAS ESPECIALES
## Special End Mills
## Fraises spéciales

**IZAR CUTTING TOOLS S.A.L.**
Parque Empresarial Boroa 2B2
48340 AMOREBIETA (Bizkaia) - Spain
Tel. +34 94 630 02 43
Fax +34 94 630 05 42
E-mail ibeobide@izartool.com
**izartool.com**

**Cliente**
Customer
Client _____

**Fecha**
Date
Date _____

**Dirección**
Address
Adresse _____

**Ciudad**
Town
Ville _____

**Contacto**
Contact
Contact _____

**Teléfono**
Phone
Téléphone _____

**E-mail**
E-mail
E-mail _____

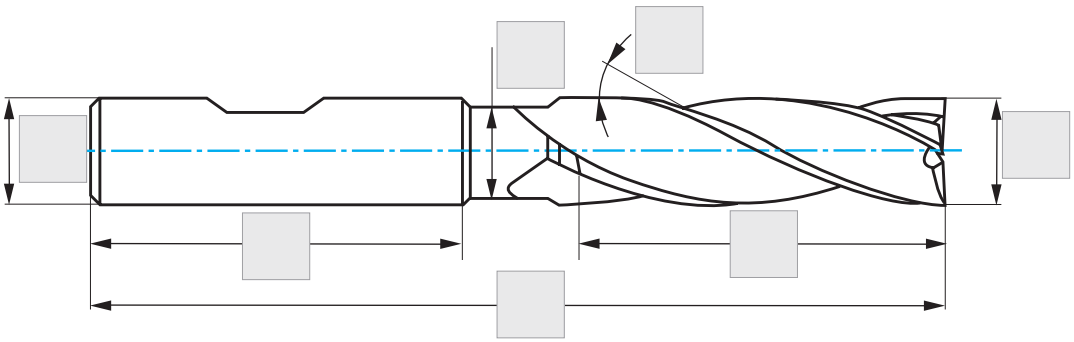
**Fax**
Fax
Fax _____

**DENOMINACIÓN HERRAMIENTA**
TOOL DENOMINATION
DÉNOMINATION DE L'OUTIL _____

**Cantidad Requerida**
Requested Quantity
Quantité demandée

**Similar a Ref. IZAR**
Similar to IZAR Ref.
Similaire à ref. IZAR

**N° Dientes**
Tooth N°
N° de dents



☐
**Corte al Centro**
Center-Cutting
Coupe au centre

☐
**Sin Corte al Centro**
Non Center-Cutting
Sans coupe au centre

**FORMA DEL MANGO** SHANK TYPE TYPE DE QUEUE

☐ DIN 1835 E (PMX-HSSE-HSS)
☐ DIN 1835 B (PMX-HSSE-HSS)
☐ DIN 1835 A (PMX-HSSE-HSS)
☐ DIN 6535 HE (MD-HM-Carbure)
☐ DIN 6535 HB (MD-HM-Carbure)
☐ DIN 6535 HA (MD-HM-Carbure)
☐ **Otro**
Another one
Autres

**GEOMETRÍA DEL PERFIL**
PROFILE GEOMETRY
GÉOMÉTRIE DU PROFIL

☐ **Acabado N**
Finishing N
Finition N

☐ **Desbaste Grueso NR**
Coarse Roughing NR
Ébauche NR

☐ **Desbaste Fino NR-F**
Fine Pitch Roughing NR-F
Ébauche Pas Fin NR-F

☐ **Desbaste Medio NF**
Roughing & Finishing NF
Semi-Ébauche NF

☐ **Otro**
Another one
Autres

**GEOMETRÍA FRONTAL**
FRONT GEOMETRY
GÉOMÉTRIE FRONTALE

☐ **Recta**
Straight
Droite

☐ **Chaflán**
Chamfer
Chamfrein

☐ **Radio**
Radius
Rayou

☐ **Radial**
Radial
Fémisphérique

☐ **Otro**
Another one
Autres

**APLICACIÓN** APPLICATION APPLICATION

**Material a Trabajar**
Material to Work
Matériel à travailler _____

**Dureza / Resistencia a la Tracción**
Hardness / Tensile Strength
Dureté / Resistance à la traction _____

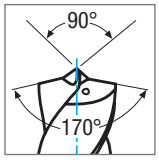
**MATERIAL PIEZA**
TOOL MATERIAL
MATÉRIEL DE L'OUTIL

☐ **MD**
HM
Carbure
☐ **PMX**
☐ **HSSE 8% Co**
☐ **HSS**
☐ **Otro**
Another one
Autres

**RECUBRIMIENTO**
COATING
REVÊTEMENT

☐ **Blanca**
Bright
Blanche
☐ **TIALSIN**
☐ **TIALN-TOP**
☐ **CROMAX**
☐ **Otro**
Another one
Autres

## BROCAS HSS M. CÓNICO REFRIGERACIÓN INTERIOR PUNTA 170°
170° Point Internal Cooling Taper Shank HSS Drill Bits
Forets HSS queue cône morse réfrigération intérieur pointe 170°




| Ø | Cantidad Mínima<br>Minimum Quantity<br>Quantité minimum |
|---|---|
| **18,00** | 1 |
| **20,00** | 1 |
| **22,00** | 1 |
| **24,00** | 1 |
| **26,00** | 1 |
| **28,00** | 1 |
| **30,00** | 1 |
| **32,00** | 1 |

## BROCAS HSS M. CÓNICO PUNTA 118°
118° Point Taper Shank HSS Drill Bits
Forets HSS queue cône morse pointe 118°

| Ø | Cantidad Mínima<br>Minimum Quantity<br>Quantité minimum |
|---|---|
| **13,00** | 1 |
| **15,00** | 1 |
| **18,00** | 1 |
| **20,00** | 1 |
| **22,00** | 1 |
| **24,00** | 1 |

| Ø | Cantidad Mínima<br>Minimum Quantity<br>Quantité minimum |
|---|---|
| **26,00** | 1 |
| **28,00** | 1 |
| **30,00** | 1 |
| **32,00** | 1 |

**Ø > 32 bajo demanda** / **upon request** / sur demande

## BROCAS MD CON/SIN REFRIGERACIÓN INTERIOR
Solid Carbide Drill Bits with/without Internal Cooling
Forets carbure avec/sans réfrigération intérieur

| Ø | Cantidad Mínima<br>Minimum Quantity<br>Quantité minimum |
|---|---|
| **6,00** | 10 |
| **8,00** | 10 |
| **10,00** | 10 |
| **12,00** | 10 |
| **14,00** | 10 |
| **16,00** | 5 |
| **18,00** | 5 |
| **20,00** | 5 |

## REAFILADO Y RECUPERACIÓN HERRAMIENTAS
Tool Resharpening & Recovery
Reaffûtage et récupération des outils

## FRESAS METAL DURO (2-3-4 Z)
Solid Carbide End Mills (2-3-4 Z)
Fraises carbure (2-3-4 Z)

| Ø | Cantidad Mínima<br>Minimum Quantity<br>Quantité minimum |
|---|---|
| **10,00** | 10 |
| **12,00** | 10 |
| **14,00** | 10 |
| **16,00** | 5 |
| **18,00** | 5 |
| **20,00** | 5 |
| **25,00** | 5 |

## FRESAS ESFÉRICAS METAL DURO
Solid Carbide Ball Nose End Mills
Fraises sphériques carbure

| Ø | Cantidad Mínima<br>Minimum Quantity<br>Quantité minimum |
|---|---|
| **10,00** | 10 |
| **12,00** | 10 |
| **14,00** | 10 |
| **16,00** | 5 |
| **18,00** | 5 |
| **20,00** | 5 |
| **25,00** | 5 |

## FRESAS MADRE / AGUJERO BAJO DEMANDA
Gear Hobs / Milling Cutters upon request
Fraises mère / Fraises à tailler sur demande

**Suplementos**
**Extra Charges**
Suppléments

**Corte Puntas Herramienta por Desgaste**
**Worn out Tool Point Cutting**
Coupe des pointes d'outil pour l'usure — +30%

**Cantidad Inferior a la Mínima indicada**
**Lower Quantity than showed Minimum**
Quantité inférieure — +10%

**Plazo**
**Delivery Date**
Délay

**Días a partir de recibir el material**
**Days from getting the material**
Jours depuis la reception del materiel — 10-12

# 14.

# INFORMACIÓN TÉCNICA

## Technical Information

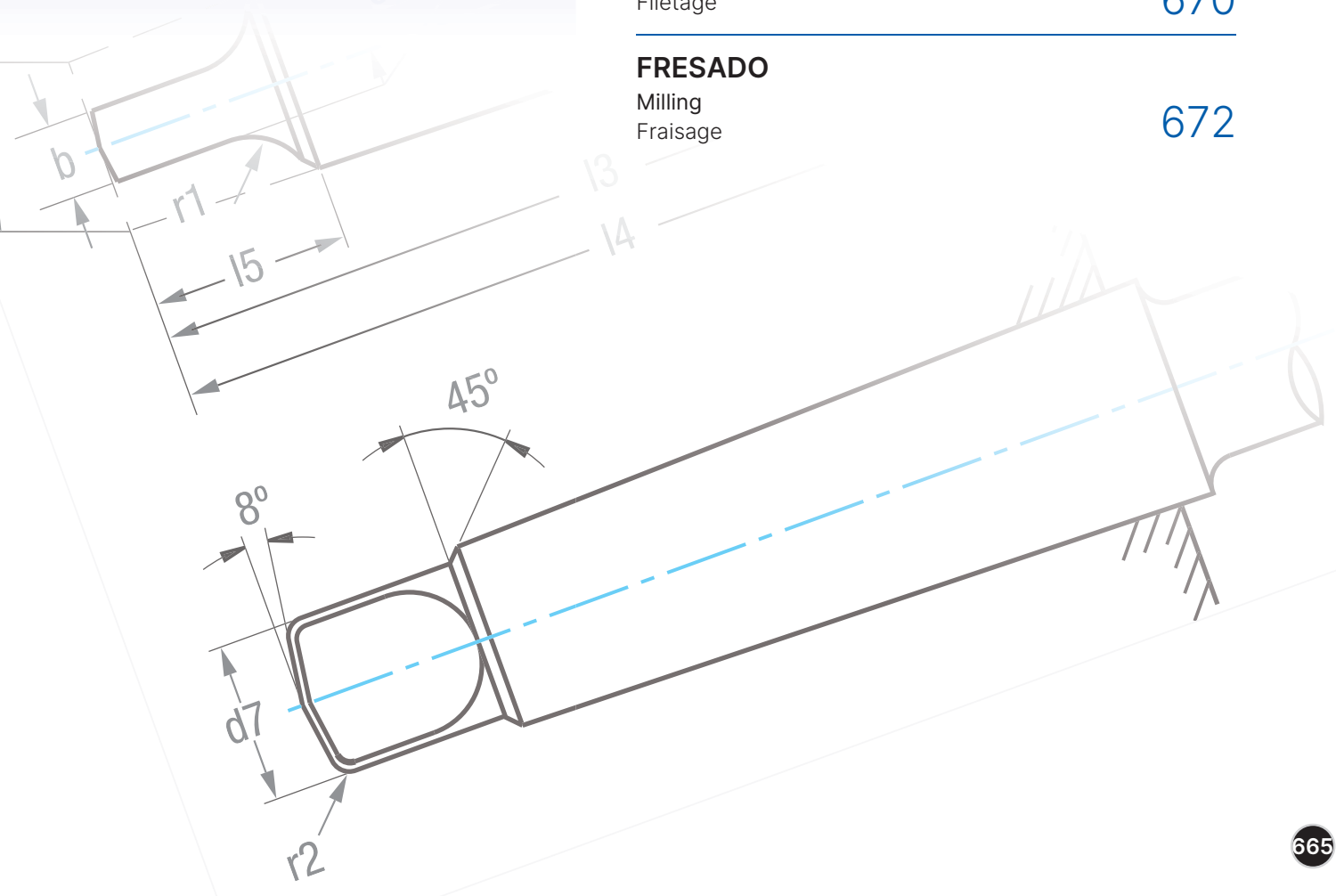
## Informations techniques


**CONDICIONES CORTE BROCAS / FRESAS**
Drill Bit / End Mill Cutting Conditions
Conditions coupe forets / fraises 666

**TALADRADO**
Drilling
Perçage 668

**ROSCADO**
Threading
Filetage 670

**FRESADO**
Milling
Fraisage 672

# CONDICIONES CORTE BROCAS
Drill Bit Cutting Conditions
Conditions coupe forets

## Ref. 8400

| Material | | Vc (m/min) | Avances f/rev. (mm/rev) - Feed - Pas | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | ALTIN | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 14 | Ø 16 |
| P | P.1 | 90-110 | 0,090 | 0,140 | 0,200 | 0,240 | 0,290 | 0,300 | 0,340 |
| | P.2 | 40-80 | 0,060 | 0,090 | 0,120 | 0,140 | 0,160 | 0,200 | 0,220 |
| | P.3 | 30-40 | 0,040 | 0,050 | 0,070 | 0,090 | 0,100 | 0,140 | 0,160 |
| | P.4 | 15-30 | 0,035 | 0,050 | 0,060 | 0,062 | 0,070 | 0,075 | 0,080 |
| | P.5 | 40-70 | 0,030 | 0,050 | 0,060 | 0,062 | 0,070 | 0,075 | 0,080 |
| M | | 35-45 | 0,045 | 0,060 | 0,080 | 0,100 | 0,120 | 0,160 | 0,180 |
| K | K.1 | 40-100 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,320 |
| | K.2 | 40-60 | 0,080 | 0,120 | 0,160 | 0,200 | 0,240 | 0,260 | 0,280 |
| S | | 30-40 | 0,040 | 0,060 | 0,080 | 0,100 | 0,120 | 0,160 | 0,180 |
| N | N.1 | 50-150 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |
| | N.2 | 50-150 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |
| | N.3 | 80-300 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |
| | N.4 | 80-300 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |
| | N.5 | 60-150 | 0,090 | 0,140 | 0,200 | 0,240 | 0,280 | 0,300 | 0,340 |

1º 2º 3º

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x f**

### Ejemplo Recomendaciones Iniciales.

- **Vc**: Velocidad de corte (m/min)
- **D ø**: Diámetro de broca (mm)
- **f**: Avance por revolución (mm)
- **r.p.m.**: Revoluciones por minuto
- **Vf**: Avance (mm/min)
- π: 3,1416 mm

### Initial Recommendation Example

- **Vc**: Cutting Speed (m/min)
- **D ø**: Diameter of the drills (mm)
- **f**: Feed per revolution (mm)
- **r.p.m.**: Revolution per minute
- **Vf**: Feed (mm/min)
- π: 3,1416 mm

### Conditions initiales conseillées

- **Vc**: Vitesse de coupe (m/min)
- **D ø**: Diametre foret (mm)
- **f**: Avance par tour (mm)
- **r.p.m.**: Tours par minute
- **Vf**: Avance (mm/min)
- π: 3,1416 mm

1º **Determinar el material a trabajar.**
Por ejemplo, Acero Inoxidable del tipo P.5. (ver pág. 9)

2º **Determinar un valor intermedio de Vc.**
Por ejemplo, 40-70 (55)

3º **Determinar f según diámetro.**
Para Ø 8 ➜ f=0,060

1º **Choose working material.**
For example, Stainless Steel of the group P.5 (see page 9)

2º **Please choose a value in the middle for Vc.**
For example, 40-70 (55)

3º **Choose f according to diameter.**
For Ø 8 ➜ f=0,060

1º **Déterminer le matériel à usiner.**
Par exemple acier INOX du groupe P.5 (voir page 9)

2º **Déterminer une valeur en moyenne de Vc.**
Par exemple, 40-70 (55)

3º **Déterminer f selon diamèter.**
Pour Ø 8 ➜ f=0,060

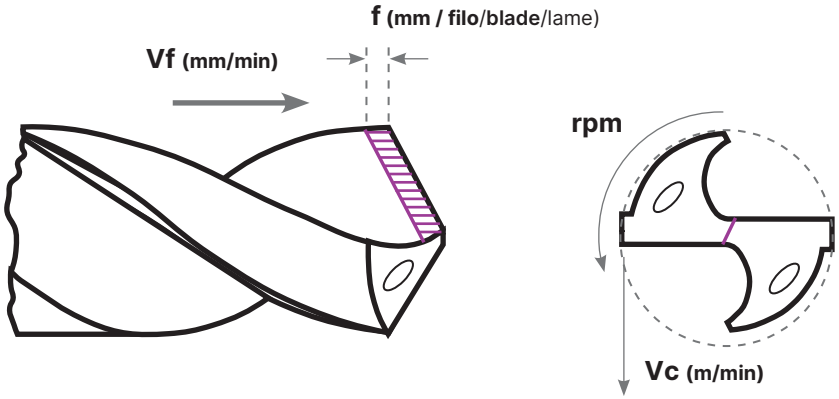
$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø} \qquad r.p.m. = \frac{55 \times 1.000}{3,14 \times 8} = 2189,49$$

**Vf = r.p.m. x f** = 2189,49 × 0,060 = **131,37 mm/min.**

Nota: En las tablas hay dos valores comunes para todas las operaciones: π (3,14) y 1000.

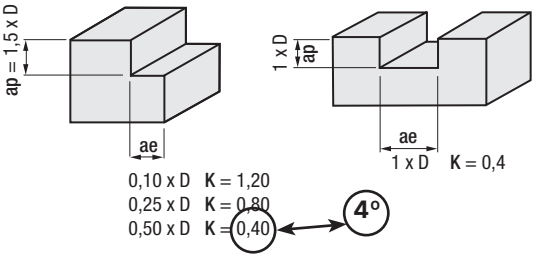
Note: In the tables there are two common values for all operations: π (3,14) & 1000.

Note: Dans les tableaux il y a deux valeurs comunes pour toutes les opérations: π (3,14) y 1000



# CONDICIONES CORTE FRESAS
End Mill Cutting Conditions
Conditions coupe fraises

## Ref. 9406




| Material | | Vc (m/min) | Avances fz/rev. (mm/z) - Feed - Pas | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Grupo | Sub. | CROMAX | Ø 2 | Ø 4 | Ø 6 | Ø 8 | Ø 10 | Ø 12 | Ø 16 | Ø 20 |
| P | P.2 | 112-150 | 0,018 | 0,030 | 0,040 | 0,056 | 0,070 | 0,090 | 0,112 | 0,140 |
| | P.3 | 60-130 | 0,015 | 0,027 | 0,036 | 0,050 | 0,056 | 0,070 | 0,084 | 0,105 |
| | P.5 | 100-130 | 0,011 | 0,019 | 0,025 | 0,035 | 0,035 | 0,056 | 0,080 | 0,100 |
| M | | 50-80 | 0,015 | 0,027 | 0,036 | 0,049 | 0,049 | 0,070 | 0,070 | 0,080 |
| K | K.1 | 80-120 | 0,018 | 0,030 | 0,040 | 0,056 | 0,077 | 0,091 | 0,112 | 0,140 |
| | K.2 | 80-100 | 0,018 | 0,030 | 0,040 | 0,056 | 0,077 | 0,091 | 0,112 | 0,140 |
| S | Ti6Al44V | 70-90 | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 |
| | Inconel 718 | 100-130 | 0,010 | 0,015 | 0,020 | 0,025 | 0,030 | 0,040 | 0,050 | 0,065 |
| N | N.1 | 140-350 | 0,020 | 0,039 | 0,051 | 0,070 | 0,084 | 0,105 | 0,112 | 0,175 |
| | N.2 | 140-350 | 0,020 | 0,039 | 0,051 | 0,070 | 0,084 | 0,105 | 0,112 | 0,175 |

$$r.p.m. = \frac{Vc \times 1.000}{\pi \times ø}$$

**Vf (mm/min.) = r.p.m. x Z x fz x K**

**K = Coeficiente corrección**
**Correction coefficient**
Coéficient correction

### Ejemplo Recomendaciones Iniciales.

- **Vc**: Velocidad de corte (m/min)
- **D ø**: Diámetro de fresa (mm)
- **Z**: Número de dientes
- **fz**: Avance por diente y revolución (mm)
- **K**: Factor de corrección
- **ae**: Profundidad de corte axial (mm)
- **ap**: Profundidad de corte radial (mm)
- **r.p.m.**: Revoluciones por minuto
- **Vf**: Avance (mm/min)
- π: 3,1416

### Initial Recommendation Example

- **Vc**: Cutting Speed (m/min)
- **D ø**: Diameter of the End Mill (mm)
- **Z**: Number of teeth
- **fz**: Feed per tooth and Rev (mm)
- **K**: Correction Coefficient
- **ae**: Axis cut depth (mm)
- **ap**: Radial Cutting Depth (mm)
- **r.p.m.**: Revolution per minute
- **Vf**: Feed per minute (mm/min)
- π: 3,1416 mm

### Conditions initiales conseillées

- **Vc**: Vitesse de coupe (m/min)
- **D ø**: Diamètre fraise (mm)
- **z**: Number of teeth
- **fz**: Avance par dent et tour (mm)
- **K**: Coefficient de Correction
- **ae**: Proffondeur coupe axiale
- **ap**: Proffondeur coupe radiale (mm)
- **r.p.m.**: Tours par minute
- **Vf**: Avance par minute (mm/min)
- π: 3,1416 mm

1º **Determinar el material a trabajar.**
Por ejemplo, Acero Inoxidable del tipo P.5. (ver pág. 9)

2º **Determinar un valor intermedio de Vc.**
Por ejemplo, 100-130 (115)

3º **Determinar fz según diámetro.**
Para Ø 16 ➜ f=0,080

4º **Determinar factor K en función de ae.**
Por ejemplo, para ae: 0,5xD ➜ K=0,40

1º **Choose working material.**
For example, Stainless Steel of the group P.5 (see page 9)

2º **Please choose a value in the middle for Vc.**
For example, 100-130 (115)

3º **Choose fz according to diameter.**
For Ø 16 ➜ f=0,080

4º **Choose K value depending on the ae.**
For example, for ae: 0,5xD ➜ K=0,40

1º **Déterminer le matériel à usiner.**
Par exemple acier INOX du groupe P.5 (voir page 9)

2º **Déterminer une valeur en moyenne de Vc.**
Par exemple, 100-130 (115)

3º **Déterminer fz selon diamèter.**
Pour Ø 16 ➜ f=0,080

4º **Déterminer le facteur K en fonction de ae.**
Par exemple, pour ae: 0,5xD ➜ K = 0,40

**r.p.m. = $\frac{Vc \times 1.000}{\pi \times ø}$** r.p.m. = $\frac{115 \times 1.000}{3,14 \times 16}$ = 2289,01 **Vf = r.p.m. x Z x fz x K** = 2289,01 x 5 × 0,080 × 0,40 = **366,24 mm/min.**

Nota: En las tablas hay 2 valores comunes para todas las operaciones: π (3,14) y 1000.

Note: In the tables there are two common values for all operations: π (3,14) & 1000

Note: Dans les tableaux il y a deux valeurs comunes pour toutes les opérations: π (3,14) y 1000

**Importante:** Condiciones de trabajo para prolongar la vida de la herramienta:
- Para series largas, reducir el avance un 50%
- Cuando la fresa taladra, reducir el avance un 50%

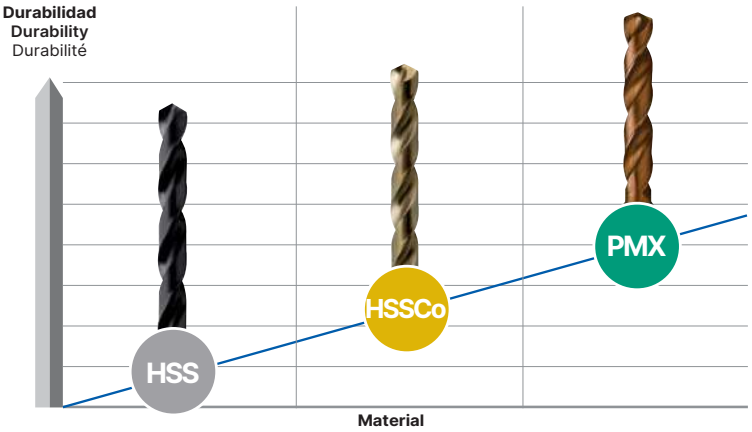
**Important:** Work conditions for a longer life of the End Mill:
- For long length, reduce feed to 50%
- When the end mill is drilling, reduce feed to 50%

**Important:** Conditions de travail pour augmenter la vie de l´outil:
- Pour séries longues, réduire l´avance un 50%
- Quand la fraise perce, réduire l´avance un 50%

## TIPOS DE BROCAS - Drill Bit Types - Types de forets

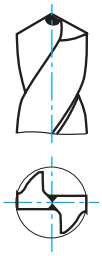
| Tipo - Type | N | H | W | S<br>Parabólico<br>Parabolic<br>Parabolique | Gran Rigidez<br>Big rigitidy<br>Grande rigidité |
|---|---|---|---|---|---|
| **Alma**<br>**Core**<br>Noyau | **Normal**<br>**Normal**<br>Normal | **Pequeña**<br>**Small**<br>Petite | **Pequeña**<br>**Small**<br>Petite | **Grande o Pequeña**<br>**Big or Small**<br>Gros ou petit | **Grande**<br>**Big**<br>Petit |
| **Ángulo de Hélice**<br>**Helix Angle**<br>Angle d'hélice | **Standard (30°)**<br>**Standard (30°)**<br>Standard (30°) | **Pequeño (12-16°)**<br>**Small (12-16°)**<br>Petit (12-16°) | **Alto (35°-40°)**<br>**High (35°-40°)**<br>Haut (35°-40°) | **Alto (35°-40°)**<br>**High (35°-40°)**<br>Haut (35°-40°) | **Medio (20°-35°)**<br>**Medium (20°-35°)**<br>Moyen (20°-35°) |
| **Ángulo en la Punta**<br>**Point Angle**<br>Angle de pointe | **Standard**<br>**Standard**<br>Standard<br>**(118° ó/or/ou 120°)** | **Standard**<br>**(118°-120°)**<br>**ó Grande**<br>**or Big**/ou gros<br>**(130°)** | **Grande (130°)**<br>**Big (130°)**<br>Gros (130°) | **Standard**<br>**(118°-120°)**<br>**ó Grande**<br>**or Big**/ou gros<br>**(130°)** | **Grande (130°)**<br>**Big (130°)**<br>Gros (130°) |
| **Uso**<br>**Use**<br>Usage | **Materiales Férricos, Fundición**<br>**Ferrous materials, Cast Iron**<br>Matériaux ferreux, Fonte | **Materiales Viruta Corta, Bronce, Latón**<br>**Short Chipping Materials, Bronze, Brass**<br>Matériaux à copeaux courts, bronze, laiton | **Materiales Viruta Larga, Aleaciones de Aluminio, Cobre**<br>**Long Chipping Materials, Aluminum Alloys, Copper**<br>Matériaux à copeaux longs, alliages d'aluminium, cuivre | **Materiales Viruta Larga, Agujeros profundos**<br>**Long Chipping Materials, Deep Holes**<br>Matériaux à copeaux longs, Trous profonds | **Materiales difíciles de mecanizar, Inox, Resistentes al calor, Aceros para muelles**<br>**Difficult-to-machine Materials, Stainless Steel, Heat-resistant, Spring Steel**<br>Matériaux difficiles à usiner, acier inoxydable, résistant à la chaleur, acier à ressort |

## MATERIAL DE CORTE-GRADOS DE CALIDAD-ACEROS RÁPIDOS
## Cutting Material-Quality Grades-HSS
Matériau de coupe-Degrées de qualité-Aciers rapides



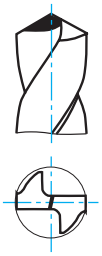

## TIPOS DE AFILADOS COMPLEMENTARIOS NORMALIZADOS (Ejecución bajo demanda)
## Types of Standardized Complementary Sharpening (Execution on request)
Types d'affûtage complémentaire normalisé (Exécution sur demande)

### FORMA Shape Forme A



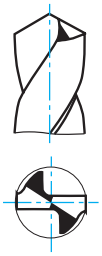
**Afilado con espesor de núcleo aguzado**
**Split Point Sharpening**
Affûtage du point en croix

### FORMA Shape Forme B



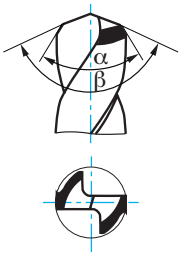
**Afilado con espesor de núcleo aguzado y perfil corregido**
**Split Point & Corrected Edge Sharpening**
Affûtage du point en croix et lèvre corrigée

### FORMA Shape Forme C



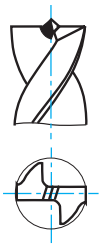
**Afilado en cruz**
**Split Point**
Affûtage en croix

### FORMA Shape Forme D




**Afilado para fundición gris**
**Grey Cast Iron Sharpening**
Affûtage pour le fonte gris

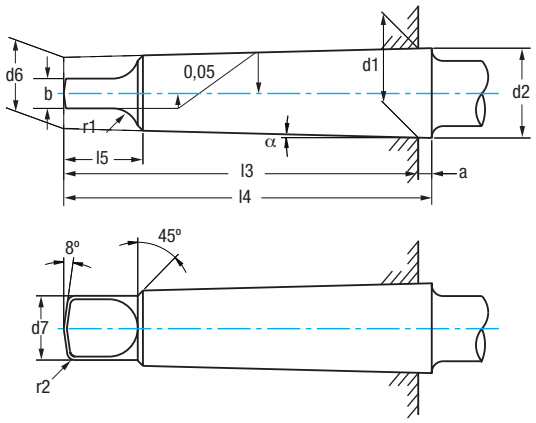
### FORMA Shape Forme E



**Afilado con punta de centrado**
**Centering Point Sharpening**
Affûtage avec une pointe de centrage

## DIMENSIONES DE CONO MORSE CON CHAVETA DIN-228

## **Morse Taper Dimensions with DIN-228 Slot** - Dimensions du cône morse avec rainure DIN-228




**Dimensiones en mm** - **Dimensions in mm** - Dimensions en mm

| **Designación del tamaño Size designation** Désignation de la taille | | **Adelgazamiento Undercutting** Amincissant | α | **a** | **b h 13** | **$d_1$** | **$d_2$ ≈** | **$d_6$ ≈** | **$d_7$ max** | **$l_3$ max** | **$l_4$ max** | **$l_5$ max** | **$r_1$** | **$r_2$** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Cono Morse Morse Taper** Cône morse | 0 | 1:19,212 = 0,05205 | 1° 29' 27" | 3 | 3,9 | 9,045 | 9,2 | 6,1 | 6 | 56,5 | 59,5 | 10,5 | 4 | 1 |
| | 1 | 1:20,047 = 0,04988 | 1° 25' 43" | 3,5 | 5,2 | 12,065 | 12,2 | 9 | 8,7 | 62 | 65,5 | 13,5 | 5 | 1,2 |
| | 2 | 1:20,020 = 0,04995 | 1° 25' 50" | 5 | 6,3 | 17,780 | 18 | 14 | 13,5 | 75 | 80 | 16 | 6 | 1,6 |
| | 3 | 1:19,922 = 0,05020 | 1° 26' 16" | 5 | 7,9 | 23,825 | 24,1 | 19,1 | 18,5 | 94 | 99 | 20 | 7 | 2 |
| | 4 | 1:19,254 = 0,05194 | 1° 29' 15" | 6,5 | 11,9 | 31,267 | 31,5 | 25,2 | 24,5 | 117,5 | 124 | 24 | 8 | 2,5 |
| | 5 | 1:19,002 = 0,05263 | 1° 30' 26" | 6,5 | 15,9 | 44,399 | 44,7 | 36,5 | 35,7 | 149,5 | 156 | 30 | 10 | 3 |
| | 6 | 1:19,180 = 0,05214 | 1° 29' 36" | 8 | 19 | 63,348 | 63,8 | 52,4 | 51 | 210 | 218 | 44 | 13 | 4 |

## **NORMAS DE BROCAS** - **Drill Bit Norms** - Normes des forets

### DIN-1897
**Extra-Corta** / **Stub** / Extra-courte

### DIN-345
**Corta** / **Jobber** / Courte

### DIN-338
**Corta** / **Jobber** / Courte

### DIN-341
**Larga** / **Long** / Longue

### DIN-340
**Larga** / **Long** / Longue

### DIN-1870
**Extra Larga** / **Extra Long** / Extra--longue

### DIN-1869
**Extra Larga** / **Extra Long** / Extra--longue

*

**Escoger la longitud de la broca teniendo en cuenta la longitud mínima necesaria para el desahogo de viruta**

**Choose the length of the drill bit taking into account the minimum length necessary for chip relief**

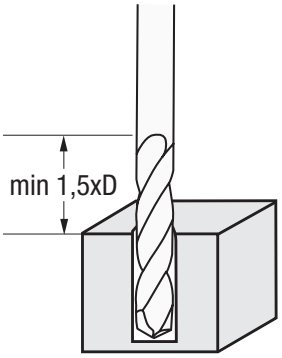
Choisir la longueur du foret en tenant compte de la longueur minimale nécessaire au dégagement des copeaux

*

**Desahogo mínimo**

**Minimum relief**

Dégagement minimal

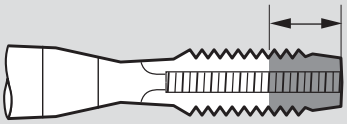


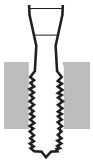
# TIPO DE ENTRADA EN MACHOS

## Chamfer Type of the Threading Taps - Type d'entrée dans tarauds

### Forma A Form

**6 - 8 hilos**-threads-filets





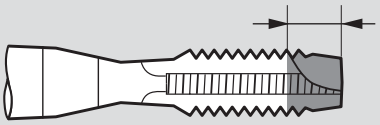
- **Chaflán de entrada largo, normalmente para agujeros pasantes y poco profundos**
- **Bajo demanda**

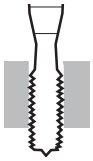
- **Long chamfer, usually for shallow through-holes**
- **Upon demand**

- Chanfrein d'entrée long, généralement pour les trous traversants et peu profonds
- Sur demande

### Forma B Form

**3,5 - 5 hilos**-threads-filets





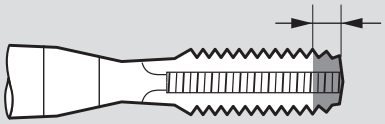
- **Entrada de longitud media**
- **Adecuado para agujeros pasantes**
- **El más estándar en los machos rectos con entrada GUN**

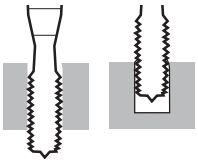
- **Medium-length chamfer**
- **Suitable for through-holes**
- **Typical for spiral point (GUN) straight taps**

- Entrée de longueur moyenne
- Apte pour les trous traversants
- Le plus standard des tarauds droits avec entrée GUN

### Forma C Form

**2 - 3 hilos**-threads-filets





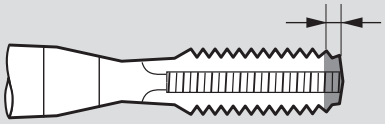
- **Entrada corta**
- **Agujeros pasantes y ciegos**
- **Estándar en machos helicoidales para agujeros ciegos**

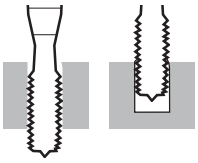
- **Short-length chamfer**
- **Through holes and blind holes**
- **Typical for spiral flute taps of blind holes**

- Entrée courte
- Trous traversants et borgnes
- Standard des tarauds hélicoïdaux pour trous borgnes

### Forma E Form

**1,5 - 2 hilos**-threads-filets





- **Entrada muy corta**
- **Agujeros ciegos con poco espacio en el fondo**
- **Bajo demanda**

- **Extra short chamfer**
- **Blind holes with little run-out length**
- **Upon demand**

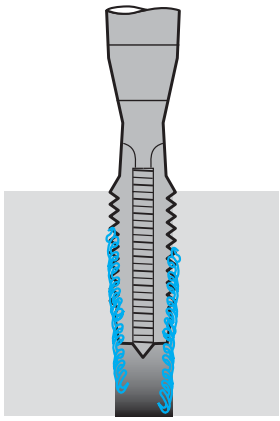
- Entrée très courte
- Trous borgnes avec peu d'espace dans le fond
- Sur demande

**Nota:**
**Cuanto más larga sea la entrada, la presión en esta es menor, y en general los machos tendrán mayor vida de uso. Asimismo en los machos de entrada larga las virutas son más finas, y en las de entrada corta obtendremos virutas más gruesas**

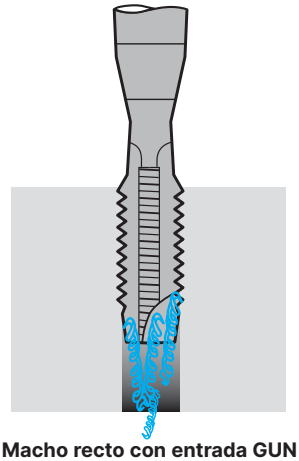
**Note:**
**The pressure is lower on the long-chámfers and generally the long-chamfer taps have a higher tool-life. Normally, the longer the chamfer, the thinner the chips. So we will get thick chips when we use short-chamfer taps**

Remarque :
Plus l'entrée est longue, plus la pression dans celle-ci est faible et, en général, les tarauds auront une plus longue durée de vie. De même, dans les tarauds à entrée longue, les copeaux sont plus fins, alors que dans les tarauds à entrée courte, nous obtiendrons des copeaux plus épais

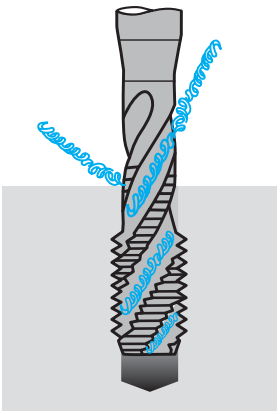
## **TIPOS DE MACHO** - **Types of Threading Taps** - Types de tarauds



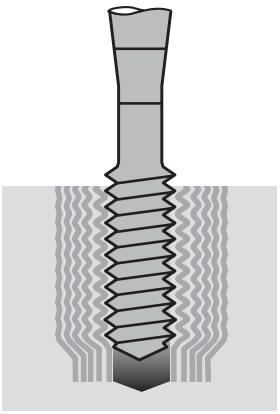
- **Macho recto**
- **Straight flute tap**
- Taraud droit



- **Macho recto con entrada GUN**
- **Spiral point (GUN) Straight tap**
- Taraud droit avec entrée GUN



- **Macho helicoidal**
- **Spiral tap**
- Taraud hélicoïdal



- **Macho de laminación**
- **Forming tap**
- Taraud à refouler

## **TIPOS DE MANGO** - **Shank Types** - Types de queue

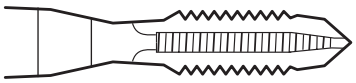
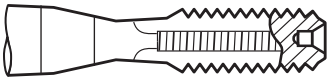
### DIN 376/374:

**Machos de máquina con mango reducido**
**Machine taps with reduced shank**
Tarauds de machine à queue réduite

### DIN 371:

**Machos de máquina con mango reforzado**
**Machine taps with reinforced shank**
Tarauds de machines à queue renforcée

## **ELABORACIÓN DE LOS FRONTALES DE LOS MACHOS**
## **Manufacturing of the fronts of the taps** - Élaboration des faces des tarauds

| **Dimensiones**<br>**Dimensions**<br>Dimensions | **Norma**<br>**Norm**<br>Norme | **Imagen**<br>**Image**<br>Image |
|---|---|---|
| M2 - M6 | DIN-352 |  |
| | DIN-357 | |
| | DIN-371 | |
| | DIN-374 | |
| | DIN-376 | |
| | DIN-2181 | |
| M3 - M10 | DIN-2174 | |
| M7-M10 | DIN-371 | |
| M7-M12 | DIN-374 | |
| M7-M12 | DIN-376 | |
| ≥ M14 | DIN-374 |  |
| ≥ M14 | DIN-376 | |
| ≥ M7 | DIN-352 | |
| ≥ M7 | DIN-2181 | |
| ≥ M7 | DIN-351 | |
| ≥ M12 | DIN-2174 | |

## ELECCIÓN DE FRESAS SEGÚN APLICACIÓN

**Choice of end mills according to application** - Choix des fraises en fonction de l'application

| **Tipos**<br>**Types**<br>Type | | **Carácterísticas y aplicaciones** | **Features and applications** | Caractéristiques et applications | **Icono**<br>**Icon**<br>Icône |
|---|---|---|---|---|---|
| **N** | | **Fresa construida para realizar trabajos de acabado.**<br>**Capacidad para fresados de pequeño y medio arranque de material. Para una gama amplia de materiales. Proporciona muy buenos acabados superficiales.** | **End mill built to perform finishing work.**<br>**Capacidad para fresados de pequeño y medio arranque de material. Para una gama amplia de materiales. It provides very good surface finishes.** | Fraise conçue pour les travaux de finition.<br>Taux d'enlèvement de matière faible/moyen. Pour une large variété de matériaux. Elle permet d'obtenir de très bonnes finitions de surface. | |
| **W** | | **Fresa construída para realizar trabajos de acabado.**<br>**Capacidad para fresados de pequeño y medio arranque de material. Para materiales ligeros y de viruta larga, como aleaciones de aluminio y cobre, y plásticos.** | **End mill built to perform finishing work.**<br>**Capable of small and medium stock removal milling. For light and long-chipping materials, such as aluminium and copper alloys and plastics.** | Fraise conçue pour les travaux de finition.<br>Taux d'enlèvement de matière faible/moyen. Pour les matériaux à copeaux légers et longs, tels que les alliages d'aluminium et de cuivre, et les matières plastiques. | |
| **WRF** | | **Fresas construidas con perfil de desbaste con paso fino y capacidad para realizar trabajos de medio y alto arranque de material.**<br>**Fácil evacuación de la viruta. Para una gama amplia de materiales. En muchos casos las superficies fresadas son de calidad aceptable.** | **End mills built with roughing profile, with fine pitch and capacity to perform medium and high stock removal jobs**<br>**Easy chip evacuation. For a wide range of materials. In many cases the milled surfaces are of acceptable quality.** | Fraise d'ébauche, à pas fin et taux d'enlèvement de matière moyen/élevé.<br>Évacuation facile des copeaux. Pour une large variété de matériaux. Dans de nombreux cas, les surfaces fraisées sont de qualité acceptable. | |

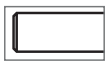
## ELECCIÓN DE FRESAS SEGÚN APLICACIÓN

**Choice of end mills according to application** - Choix des fraises en fonction de l'application

| **Tipos**<br>**Types**<br>Type | | **Carácterísticas y aplicaciones** | **Features and applications** | Caractéristiques et applications | **Icono**<br>**Icon**<br>Icône |
|---|---|---|---|---|---|
| **NR** | | **Fresas construidas con perfil de desbaste, con paso normal y capacidad para realizar trabajos de medio y alto arranque de material.**<br>**Para una gama amplia de materiales. En la mayoria de los casos es necesario un acabado adicional.** | **End mills built with roughing profile, with normal pitch and capacity to perform medium and high stock removal jobs.**<br>**For a wide range of materials. In most cases, additional finishing is required.** | Fraises d'ébauche, à pas normal et taux d'enlèvement de matière moyen/élevé. Pour une large variété de matériaux.<br>Dans la plupart des cas, une finition supplémentaire est nécessaire. | |
| **NRF** | | **Fresas construidas con perfil de desbaste, con paso fino y capacidad para realizar trabajos de medio y alto arranque de material**<br>**Para una gama amplia de materiales. En muchos casos las superficies fresadas son de calidad aceptable.** | **End mills built with roughing profile, with fine pitch and capacity to perform medium and high stock removal jobs.**<br>**For a wide range of materials. In many cases the milled surfaces are of acceptable quality.** | Fraise d'ébauche, à pas fin et taux d'enlèvement de matière moyen/élevé. Pour une large variété de matériaux.<br>Dans de nombreux cas, les surfaces fraisées sont de qualité acceptable. | |
| **NF** | | **Fresas construidas con perfil de desbaste terminado y capacidad para realizar trabajos de medio y alto arranque de material.**<br>**Para materiales abrasivos como aleaciones de titanio, aceros inoxidables y en general materiales con alto contenido de cromo y niquel. En muchos casos las superficies fresadas son de calidad aceptable.** | **End mills built with finished roughing profile and capacity to perform medium and high stock removal jobs.**<br>**For abrasive materials such as titanium alloys, stainless steels and in general materials with high chromium and nickel content. In many cases the milled surfaces are of acceptable quality.** | Fraises d'ébauche, taux enlèvement de matière moyen/élevé.<br>Pour les matériaux abrasifs, tels que les alliages de titane, les aciers inoxydables et, en général, les matériaux à forte teneur en chrome et en nickel. Dans de nombreux cas, les surfaces fraisées sont de qualité acceptable. | |

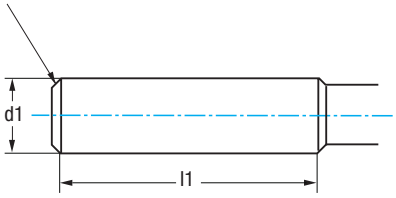
## MANGOS CILÍNDRICOS PARA HERRAMIENTAS DE ACERO RÁPIDO S/DIN-1835 (Otros bajo demanda)
## Straight Shanks for HSS Tools according to DIN-1835 (Others upon request)
Queues cylindriques pour outils d'acier rapide selon DIN-1835 (Autres sur demande)

**FORMA**
**Form**
Forme



**A** **(MANGO LISO)**
**(Plain Shank)**
(Queue plaine)

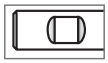
**Chaflán** - Chamfer - Chanfrein




| $d_1$ $h_8$ | $l_1$ + 2 0 | $d_1$ $h_8$ | $l_1$ +2 0 |
|---|---|---|---|
| 2 | 28 | 16 | 48 |
| 3 | 28 | 20 | 50 |
| 4 | 28 | 25 | 56 |
| 5 | 28 | 32 | 60 |
| 6 | 36 | 40 | 70 |
| 8 | 36 | 50 | 80 |
| 10 | 40 | 63 | 90 |
| 12 | 45 | | |
| | | | |

**Dimensiones en mm** - **Dimensions in mm** - Dimensions en mm

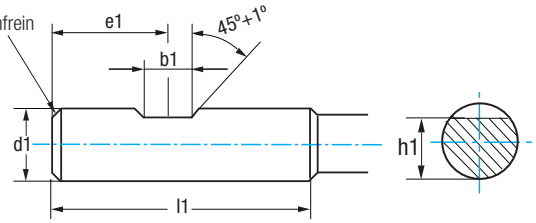
**FORMA**
**Form**
Forme



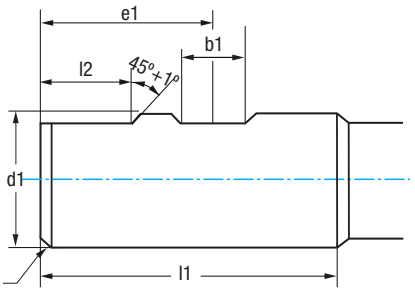
**B** **(PLANOS DE ARRASTRE)**
**(With Drive Flat)**
(Avec plans de traction)

**Con un plano de arrastre para d1 = 6 y 20 mm**
**With one drive flat for d1 = 6 and 20 mm**
Avec un plan de traction pour d1= 6 et 20 mm

**Chaflán** - Chamfer - Chanfrein




**Con dos planos de arrastre para d1 = 25 y 32 mm**
**With two drive flats for d1 = 25 and 32 mm**
Avec deux plans de taction pour d1= 25 et 32 mm



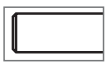

**Chaflán** - Chamfer - Chanfrein

| $d_1$ $h_6$ | $b_1$ + 0,05 0 | $e_1$ 0 -1 | $h_1$ h13 | $l_1$ +2 0 | $l_2$ + 1 0 |
|---|---|---|---|---|---|
| 6 | 4,2 | 18 | 4,8 | 36 | - |
| 8 | 5,5 | 18 | 6,6 | 36 | - |
| 10 | 7 | 20 | 8,4 | 40 | - |
| 12 | 8 | 22,5 | 10,4 | 45 | - |
| 16 | 10 | 24 | 14,2 | 48 | - |
| 20 | 11 | 25 | 18,2 | 50 | - |
| 25 | 12 | 32 | 23 | 56 | 17 |
| 32 | 14 | 36 | 30 | 60 | 19 |
| 40 | 14 | 40 | 38 | 79 | 19 |
| 50 | 18 | 45,6 | 47,8 | 80 | 23 |
| 63 | 18 | 50 | 60,8 | 90 | 23 |

**Dimensiones en mm** - **Dimensions in mm** - Dimensions en mm

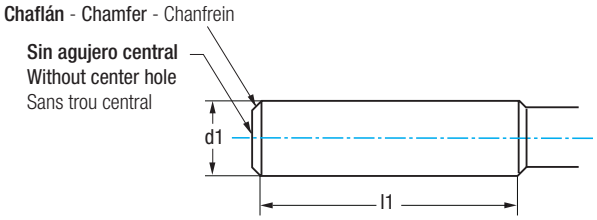
## MANGOS CILÍNDRICOS PARA HERRAMIENTAS DE METAL DURO S/DIN-6535 (Otros bajo demanda)
## Straight Shanks for Carbure Tools according to DIN-6535 (Others upon request)
## Queues cylindriques pour outils de carbure selon DIN-6535 (Autres sur demande)

**FORMA**
**Form**
Forme



# HA

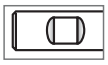
**(MANGO LISO)**
**(Plain Shank)**
(Queue plaine)




| $d_1$ $h_6$ | $l_1$ +2 0 | $d_1$ $h_6$ | $l_1$ +2 0 |
|---|---|---|---|
| 2 | 28 | 14 | 45 |
| 3 | 28 | 16 | 48 |
| 4 | 28 | 18 | 48 |
| 5 | 28 | 20 | 50 |
| 6 | 36 | 25 | 56 |
| 8 | 36 | 32 | 60 |
| 10 | 40 | | |
| 12 | 45 | | |

**Dimensiones en mm** - **Dimensions in mm** - Dimensions en mm

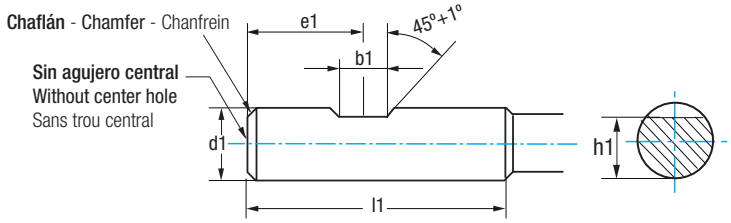
**FORMA**
**Form**
Forme



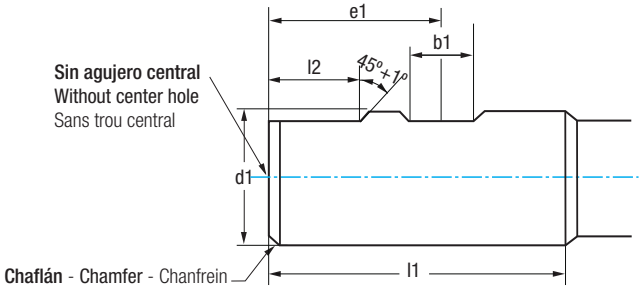
# HB

**(PLANOS DE ARRASTRE)**
**(With Drive Flat)**
(Avec plans de traction)

**Con un plano de arrastre para d1 = 6 y 20 mm**
**With one drive flat for d1 = 6 and 20 mm**
Avec un plan de traction pour d1= 6 et 20 mm



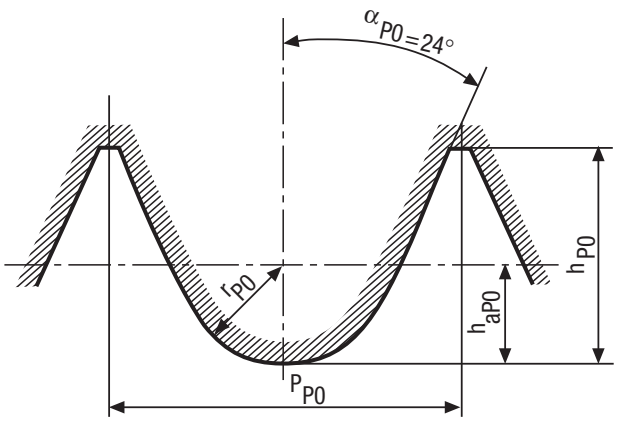

**Con dos planos de arrastre para d1 = 25 y 32 mm**
**With two drive flats for d1 = 25 and 32 mm**
Avec deux plans de taction pour d1= 25 et 32 mm




| $d_1$ $h_6$ | $b_1$ +0,05 0 | $e_1$ 0 -1 | $h_1$ h11 | $l_1$ +2 0 | $l_2$ +1 0 |
|---|---|---|---|---|---|
| 6 | 4,2 | 18 | 5,1 | 36 | - |
| 8 | 5,5 | 18 | 6,9 | 36 | - |
| 10 | 7 | 20 | 8,5 | 40 | - |
| 12 | 8 | 22,5 | 10,4 | 45 | - |
| 14 | 8 | 22,5 | 12,7 | 45 | - |
| 16 | 10 | 24 | 14,2 | 48 | - |
| 18 | 10 | 24 | 16,2 | 48 | - |
| 20 | 11 | 25 | 18,2 | 50 | - |
| 25 | 12 | 32 | 23 | 56 | 17 |
| 32 | 14 | 36 | 30 | 60 | 19 |

**Dimensiones en mm** - **Dimensions in mm** - Dimensions en mm

# DIN-8197



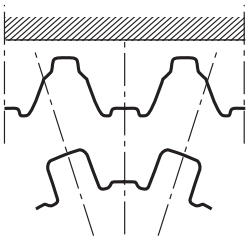

**Línea de referencia del perfil**
**Profile line reference**
Ligne de référence du profil

| | |
|---|---|
| $P_{P0}$ | **Paso del perfil de referencia = 1,005-p cadena** |
| $h_{P0}$ | **Altura del diente del perfil de referencia** |
| $h_{aP0}$ | **Altura de la cabeza del perfil de referencia = 0,5. $d_1$** |
| $r_{P0}$ | **Radio de la cabeza del diente del perfil de referencia** |
| $\alpha_{P0}$ | **Ángulo del perfil de referencia** |
| $P_{P0}$ | **Reference profile pitch = 1.005 x chain pitch** |
| $h_{P0}$ | **Reference profile Tooth height** |
| $h_{aP0}$ | **Reference profile addendum height = 0.5.$d_1$** |
| $r_{P0}$ | **Reference profile tooth addendum radius** |
| $a_{P0}$ | **Reference profile angle** |

| | |
|---|---|
| $P_{P0}$ | Pas du profil de référence = 1005-p chaine |
| $h_{P0}$ | Hauteur du dent du profil de référence |
| $h_{aP0}$ | Hauteur de la tête du profil de référence = 0,5.$d_1$ |
| $r_{P0}$ | Rayon de la tête du dent du profil de référence |
| $\alpha_{P0}$ | Angle du profil de référence |

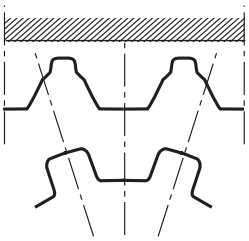
| **Perfil de referencia**<br>**Reference profile**<br>Proil de référence | | | | **Cadena correspondiente**<br>**Chain Number**<br>Chaine correspondante | | |
|---|---|---|---|---|---|---|
| **Perfil núm.**<br>**Profil nr.**<br>Profil num. | $r_{P0}$ | $P_{P0}$ | $h_{P0}$ | **Cadena núm.**<br>**Chain nr.**<br>Chaine num. | **Paso**<br>**Pitch**<br>Pas<br>**p** | **Diámetro del rodillo**<br>**Roller diameter**<br>Diam. rouleau<br>$d_1$ |
| 1 | 1,66 | 5,0250 | 3,0 | 03 B | 5 | 3,2 |
| 2 | 2,07 | 6,0300 | 3,5 | 04 B | 6 | 4 |
| 3 | 2,58 | 8,0400 | 5,0 | 05 B | 8 | 5 |
| 4 | 3,26 | 9,5726 | 5,7 | 06 B | 9,525 | 6,35 |
| 5 | 4,06 | 12,7635 | 7,9 | 08 A | 12,7 | 7,92 |
| | | | | 081 a 084 | | 7,75 |
| | | | | 085 | | 7,77 |
| 6 | 4,36 | 12,7635 | 7,5 | 08 B | | 8,51 |
| 7 | 5,2 | 15,9544 | 9,8 | 10 A y 10 B | 15,875 | 10,16 |
| 8 | 6,16 | 19,1453 | 11,9 | 12 A | 19,05 | 11,91 |
| | | | | 12 B | | 12,07 |
| 9 | 8,09 | 25,5270 | 15,9 | 16 A y 16 B | 25,4 | 15,88 |
| 10 | 9,7 | 31,9088 | 19,9 | 20 A y 20 B | 31,75 | 19,05 |
| 11 | 11,31 | 38,2905 | 23,9 | 24 A | 38,1 | 22,23 |
| 12 | 12,92 | 38,2905 | 22,5 | 24 B | | 25,4 |
| 13 | 12,92 | 44,6723 | 27,8 | 28 A | 44,45 | 25,4 |
| 14 | 14,2 | 44,6723 | 27,8 | 28 B | | 27,94 |
| 15 | 14,52 | 51,0540 | 31,8 | 32 A | 50,8 | 28,58 |
| 16 | 14,84 | 51,0540 | 31,8 | 32 B | | 29,21 |
| 17 | 20,14 | 63,8175 | 39,7 | 40 A | 63,5 | 39,68 |
| | | | | 40 B | | 39,37 |
| 18 | 24,16 | 76,5810 | 47,7 | 48 A | 76,2 | 47,63 |
| 19 | 24,48 | 76,5810 | 47,7 | 48 B | | 48,26 |
| 20 | 27,37 | 89,3445 | 55,6 | 56 B | 88,9 | 53,98 |
| 21 | 32,19 | 102,1080 | 63,6 | 64 B | 101,6 | 63,5 |
| 22 | 36,68 | 114,8715 | 71,5 | 72 B | 114,3 | 72,39 |

## VARIANTES PERFIL FRESAS MADRE PARA TALLADO DE EJES ESTRIADOS
Spline Shaft Hob Profile Types
Types de profil pour fraises mere à tailler les arbres cannelés



# MA

**PERFIL CON PROTUBERANCIAS Y CHAFLANES**
**Profile with lugs and chamfers**
Profil avec protubérances et chanfreins



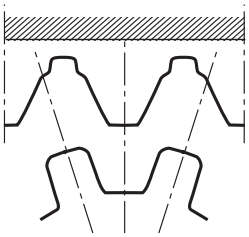
# MB

**PERFIL CON CHAFLANES Y SIN PROTUBERANCIAS**
**Profile with chamfers and without lugs**
Profil avec chanfreins et sans protuberances

**Para generar la parte activa del flanco del perfil, en ejes que permitan el redondeo del canto del fondo**

**For generating profile active flank at shafts which allows generating fillet at bottom**

Pour créer la partie active du flanc du profils, sur des arbres qui permettent arrondir l´arête du fond



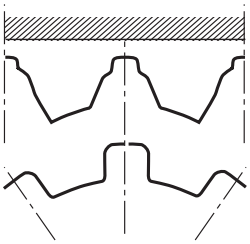
# MC

**PERFIL CON CHAFLANES Y SIN PROTUBERANCIAS**
**Profile with chamfers and without lugs**
Profil avec chanfreins et sans protuberances

**Para generar la altura total del flanco del perfil y obtener el fondo redondeado**

**For generating the total height profile flank and to obtain generated fillet at bottom**

Pour créer l´hauteur totalle de l´arête du profil et avec un fond arrondi



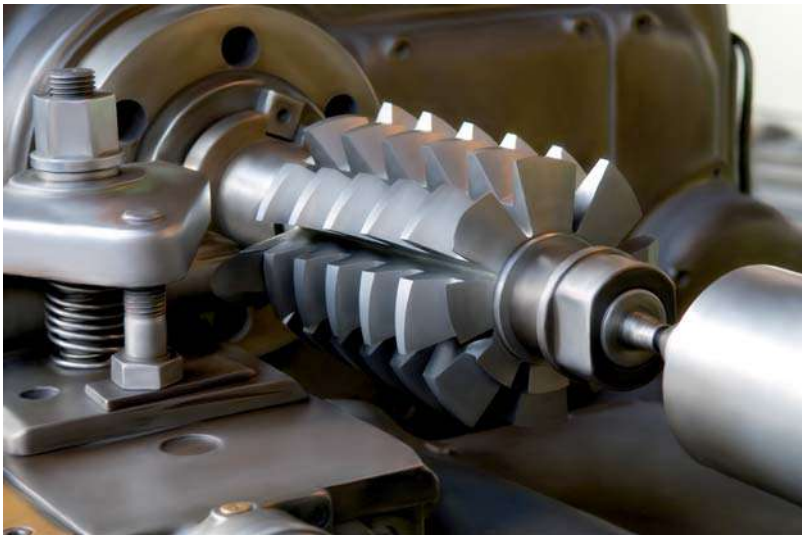
# MD

**PERFIL PARA OBTENER CANTOS VIVOS EN EL FONDO DEL DIENTE**
**Profile to obtain squared edges at tooth bottom**
Profil pour créer des arêtes vives sur le fond du dent

**Solamente para fresas madres de posición fija**

**Only for hobs with fixed position**

Seulement pour des fraise mères en position fixe



**Las fresas madres para el tallado de ejes estriados se fabrican normalmente en ejecución con PERFIL RECTIFICADO**

**Spline shaft hobs are usually ground PROFILE MANUFACTURED**

Les fraises mere à tailler les arbres cannelés sont fabriquées normallement en execution avec PROFIL RECTIFIÉ

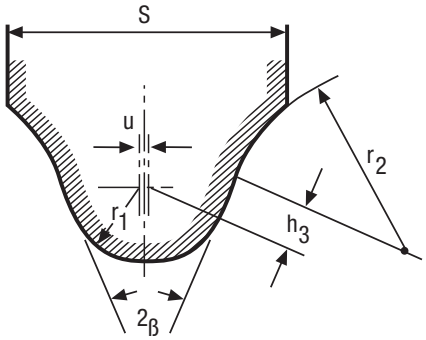
**La ejecución terminada a cuchilla solamente puede ser aconsejable en algunos trabajos de desbaste**

**Insert formed profile is only suitable for some roughing operations**

L´execution terminée à lame seulement peut être recommandée pour des travaux d´ébauche spécifiques

## PERFIL REFERENCIA EN FRESAS DISCO PARA CADENAS
Reference Profiles for Roller Chain Sprocket Cutters
Profils de réference sur fraises scies pour roués à chaines

# DIN-8198




**Medidas en mm.**
**Dimensions in mm**
Mesures en mm

| **Cadena** **Chain** Chaines | | **Perfil** **Profil** Profil | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Paso** **Pitch** Pas | **Diám. rodillo** **Roller diameter** Diam. rouleau | | | **I** **2 ß = 74°** | | | **II** **2 ß = 66°** | | | **III** **2 ß = 56°** | | | **IV** **2 ß = 47°** | | | **V** **2 ß = 38°** | | |
| **t** | **$d_1$** | **$r_1$** | **u** | **$h_3$** | **$r_2$** | **S mínima minim** minimale | **$h_3$** | **$r_2$** | **S mínima minim** minimale | **$h_3$** | **$r_2$** | **S mínima minim** minimale | **$h_3$** | **$r_2$** | **S mínima minim** minimale | **$h_3$** | **$r_2$** | **S mínima minim** minimale |
| 6 | 4 | 2,04 | 0,12 | 1,2 | 4,8 | 7,5 | 1,2 | 4,8 | 7,4 | 1,2 | 4,8 | 7,3 | 1,2 | 4,8 | 7,1 | 1,4 | 2 | 7 |
| 6,35 | 3,3 | 1,68 | 0,13 | 1 | 5,1 | 8,5 | 1 | 5,1 | 8,4 | 1 | 5,1 | 8,3 | 1 | 5,1 | 8,2 | 1,2 | 1,7 | 8,1 |
| 8 | 5 | 2,55 | 0,16 | 1,5 | 6,4 | 9,8 | 1,5 | 6,4 | 9,8 | 1,5 | 6,4 | 9,6 | 1,5 | 6,4 | 9,5 | 1,8 | 2,5 | 9,2 |
| 9,525 | 5 | 2,55 | 0,19 | 1,5 | 7,6 | 11,3 | 1,5 | 7,6 | 11,4 | 1,5 | 7,6 | 11,3 | 1,5 | 7,6 | 11,1 | 1,8 | 2,5 | 10,9 |
| | 5,08 | 2,55 | | 1,5 | | 11,3 | 1,5 | | 11,4 | 1,5 | | 11,3 | 1,5 | | 11,1 | 1,8 | 2,5 | 10,9 |
| | 6 | 3,06 | | 1,8 | | 11,7 | 1,8 | | 11,7 | 1,8 | | 11,5 | 1,8 | | 11,3 | 2,2 | 3 | 11 |
| | 6,35 | 3,24 | | 1,9 | | 11,9 | 1,9 | | 11,8 | 1,9 | | 11,6 | 1,9 | | 11,4 | 2,3 | 3,2 | 11 |
| 12,7 | 7 ,75*) | 4,05 | 0,25 | 2.4 | 10 | 15,6 | 2.4 | 10 | 15,6 | 2,4 | 10 | 15,4 | 2,4 | 10 | 15 | 2,9 | 4 | 14,6 |
| | 7,94 | | | | | | | | | | | | | | | | | |
| | 8,51 | 4,34 | | 2,6 | | 15,9 | 2,6 | | 15,7 | 2,6 | | 15,5 | 2,6 | | 15,1 | 3,1 | 4,3 | |
| 15,875 | 10,16 | 5,18 | 0,32 | 3 | 12,7 | 19,6 | 3 | 12,7 | 19,5 | 3 | 12,7 | 19,2 | 3 | 12,7 | 18,8 | 3,7 | 5,1 | 18,3 |
| 19,05 | 11,9*) | 6,16 | 0,38 | 3,6 | 15,2 | 23,5 | 3,6 | 15,2 | 23,4 | 3,6 | 15,2 | 23 | 3,6 | 15,2 | 22,6 | 4,3 | 6 | 21,9 |
| | 12,07 | | | | | | | | | | | | | | | | | |
| 25,4 | 15,88 | 8,1 | 0,51 | 4,8 | 20 | 31,5 | 4,8 | 20 | 31 | 4,8 | 20 | 31 | 4,8 | 20 | 30 | 5,7 | 8 | 29,5 |
| (30) | | | 0,6 | | 24 | 35,5 | | 24 | 36 | | 24 | 35,5 | | 24 | 35 | | | 34,5 |
| 31,75 | 19,05 | 9,7 | 0,64 | 5,7 | 25,5 | 39 | 5,7 | 25,5 | 38,5 | 5,7 | 25,5 | 38 | 5,7 | 25,5 | 37,5 | 6,9 | 9,5 | 36,5 |
| 38,1 | 22,22 | 11,3 | 0,76 | 6,7 | 31 | 46 | 6,7 | 31 | 46 | 6,7 | 31 | 45,5 | 6,7 | 31 | 45 | 8 | 11 | 44 |
| | 25,4 | 13,0 | | 7,6 | | 47,5 | 7,6 | | 47 | 7,6 | | 46,5 | 7,6 | 31 | 45,5 | 9,2 | 13 | 44 |
| 44,45 | 25,4 | 13,0 | 0,89 | 7,6 | 36 | 60 | 7,6 | 36 | 56,5 | 7,6 | 36 | 54,5 | 7,6 | 36 | 53 | 9,2 | 13 | 51,5 |
| | 27,94 | 14,3 | | 8.4 | | 61,5 | 8,4 | | 57,5 | 8,4 | | 55,5 | 8,4 | | 53,5 | 10 | 14 | 52 |
| 50,8 | 28,57*) 29,21 | 14,9 | 1 | 8,8 | 41 | 69 | 8,8 | 41 | 65 | 8,8 | 41 | 62,5 | 8,8 | 41 | 60,5 | 10,5 | 14,5 | 59 |
| 57,15 | 35,71 | 18,3 | 1,2 | 10,7 | 46 | 78,5 | 10,7 | 46 | 74 | 10,7 | 46 | 71 | 10,7 | 46 | 69 | 12,9 | 18 | 67 |
| 63,5 | 39,37*) | 20,2 | 1,3 | 11,8 | 51 | 87,5 | 11,8 | 51 | 82 | 11,8 | 51 | 79 | 11,8 | 51 | 76,5 | 14,2 | 20 | 74 |
| | 39,68 | | | | | | | | | | | | | | | | | |
| 76,2 | 47,62*) | 24,6 | 1,5 | 14,5 | 61 | 105 | 14,5 | 61 | 98,5 | 14,5 | 61 | 95 | 14,5 | 61 | 92 | 17,4 | 24 | 89 |
| | 48,26 | | | | | | | | | | | | | | | | | |

**Evítese en lo posible el tamaño entre paréntesis.**

***) Para estos diámetros de rodillos sirven los perfiles del diámetro de rodillo inmediato superior de igual paso.**

**Cadenas, DIN 8180, DIN 8187, DIN 8188 y DIN 73232.**

**Ruedas de cadena para cadenas de casquillos y de rodillos, DIN 9196.**

**Try to avoid sizes in brackets**

***) For these roller diameters It can be used upper roll diameter profiles with same pitch.**

**Chains DIN 8180, DIN 8187, DIN 8188, DIN 73232.**

**Sprocket wheel for roller chains DIN 9196.**

Il faut éviter si possible les pas entre parenthése.

*) Pour ces diamétres de rouleaux on emploie les profils du diamétre de rouleau immédiat avec le même pas.

Chaines, DIN 8180, DIN 8187, DIN 8188 y DIN 73232

Roues de chaines pour chaines de culots et rouleaux.

**Aplicación**
**Application**
Application

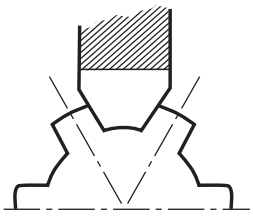
| **Perfil** **Profil** Profil | **Juego de 5 piezas para v < 12 m/s.** **5 pieces set for v < 12m/s.** Jeux de 5 pièces pour v < 12 m/s. |
|---|---|
| **I** | 6 a 8 |
| **II** | 9 a 11 |
| **III** | 12 a 16 |
| **IV** | 17 a 29 |
| **V** | **Más de 29** / **More than 29** / Plus de 29 |

**Nuestra fabricación normal se compone de juegos de 5 piezas (recuadro)**

**Our standar manufacturing set is 5 pieces (see table)**

Notre fabrication normale est compose de 5 pièces (tableau)

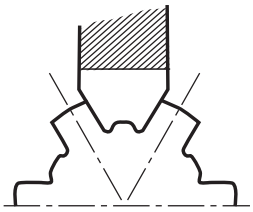
## VARIANTES PERFIL FRESAS DISCO PARA TALLADO DE EJES ESTRIADOS
Spline Shaft Single Cutter Profile Types
Types de profil pour fraises scies à tailler les arbres cannelés



# A

### FRESA DE ACABADO
**Finishing cutter** Fraise finition

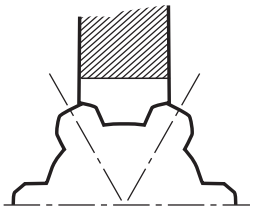
**Sin chaflanes ni protuberancias**
**Without chamfers and lugs**
Sans chanfreins ni protuberances



# B

### FRESA DE ACABADO O DESBASTE
**Roughing or finishing cutter** Fraise finition où ébauche

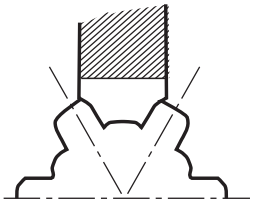
**Con protuberancias y sin chaflanes**
**With lugs and without chamfers**
Avec protuberances et sans chanfreins



# C

### FRESA DE ACABADO
**Finishing cutter Fraise finition**

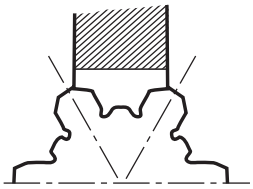
**Con chaflanes y sin protuberancias**
**With chamfers and without lugs**
Avec chanfreins et sans protuberances



# D

### FRESA DE ACABADO O DESBASTE
**Roughing or finishing cutter** Fraise finition où ébauche

**Con chaflanes y protuberancias**
**With chamfers and lugs**
Avec chanfreins et protuberances



# E

### FRESA ESPECIAL PARA DESBASTE
**Special cutter for roughing** Fraise spéciale ébauche

**Con protuberancia lateral para facilitar el rectificado y chaflanes**
**With chamfers and side lug to make easier grind operation.**
Avec protuberance latérale pour faciliter le rectifié et les chanfreins

**Estas fresas se fabrican normalmente en ejecución terminada a cuchilla y bajo demanda, pueden ser suministradas con perfil rectificado**

**These cutters are usually insert form relieved manufactured and upon request they can be supplied with ground profile**

Ces fraises sont fabriquées normallement sur demande et peuvent être livrées avec profil rectifié

**Estas fresas pueden ser suministradas en juegos, para fresar simultáneamente varios ejes**

**These cutters can be supplied in sets for milling several shafts simultaneously**

Ces fraises peuvent être livrées en jeux, pour fraiser plusieurs arbres au même temps

**El excedente que normalmente damos por flanco, en las fresas para desbaste es de 0,125 mm. (0,250 mm en espesor). Otras creces deben de indicarse expresamente**

**For standard manufacturing, stock per flank is 0.125 mm for roughing cutters ( 0.250 mm thick ). Other stock values must be indicated with the order**

L´excedent qu´on considére arête normallement pour les fraises ébauche est de 0.125 mm (0.25 mm d´épaisseur) D´autres données doivent s´indiquer expressemment

**SÍMBOLOS UTILIZACIÓN HERRAMIENTA** - **Tool Use Symbols** - Symboles usage outils

## GENERAL

**Herramienta de Mano**
Hand Tool
Outil à main

**Acero**
Steel
Aciers

**Plástico**
Plastic
Plastique

**Metacrilatos**
Methacrylates
Méthacrylates

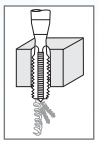
## TALADRADO - Drilling - Perçage

**Especial Taladro Batería**
Power Tool Special
Spécial perceuse à main

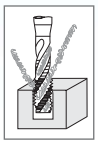
**Asiento Allen**
Allen Seat
Logement Allen

**Asiento Cónico**
Taper Seat
Logement conique

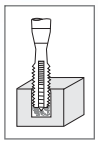
## ROSCADO - Threading - Taraudage



**Agujero Pasante**
Through Hole
Trou débouchant



**Agujero Ciego**
Blind Hole
Trou borgne



**Agujero Ciego**
Blind Hole
Trou borgne

**Bujía**
Spark Plug
Bougie

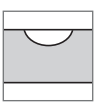
## FRESADO - Milling - Fraisage

**Desbaste Fino**
Fine Pitch Roughing
Ébauche pas fin

**Desbaste Grueso**
Coarse Roughing
Ébauche

**Desbaste Medio**
Roughing & Finishing
Semi-Finition

**Ranuras en "T"**
T Slots
Rainures en T



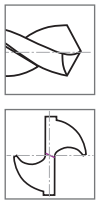
**Ranuras Woodruff**
Woodruff Slots
Rainures Woodruff

**Perfiles**
Profiles
Profils

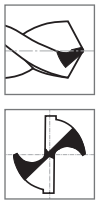
# ÍNDICE SÍMBOLOS
Symbol Index
Index de symboles

**SÍMBOLOS CARACTERÍSTICAS HERRAMIENTA - Tool Characteristics Symbols -** Symboles caractéristiques outils

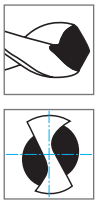
## TALADRADO - Drilling - Perçage



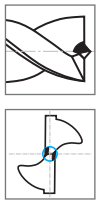
**Punta Cónica con Afilado Universal**
Universal Relieved Cone Point
Pointe conique universel



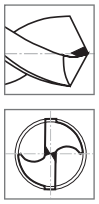
**Afilado en Cruz Tipo DIN 1412 "C"**
Split Point DIN 1412 "C" type
Affûtage en croix type DIN 1412 "C"



**Filo Corregido tipo "U"**
"U" type Corrected Edge
Lèvre corrigée type "U"

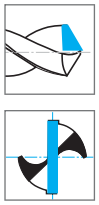


**Punta Centrar Tipo DIN 1412 "E"**
Center Point DIN 1412 "E" type
Pointe à centrer type DIN 1412 "E"



**Afilado Tipo DIN 1412 "A"**
Split Point DIN 1412 "A" type
Affûtage pointe type DIN 1412 "A"

**Afilado Tipo "Convex"**
Split Point "Convex" Type
Affûtage pointe type "Convex"



**Punta Metal Duro**
Carbide Tipped
Pointe carbure

**Ángulo Punta**
Point Angle
Angle de pointe

**Hélice Izquierda**
Left Hand Helix
Hélice à gauche

**Hélice Derecha**
Right Hand Helix
Hélice à droite

**Ángulo de Hélice**
Helix Angle
Angle d'hélice

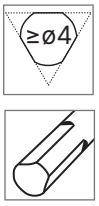
**Perfil Parabólico "S"**
S Parabolic Profile
Profil parabolique S

**Mango Rebajado**
Reduced Shank
Queue réduite

**Mango Cilíndrico**
Straight Shank
Queue cylindrique

**Mango Cónico**
Morse Taper Shank
Queue conique

**Puntos Soldadura**
Welding Point
Points soudure




**Mango 3 Planos**
3-Flat Shank
Attachement 3 plans

**Avellanado Radial**
Radial Countersinking
Fraisage radiale

**Ángulo Broca Escalonada**
Step Drill Angle
Angle de foret etagé

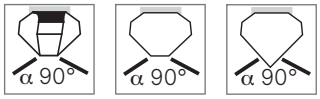
**Conicidad**
Taper
Conicité

**Pulido Espejo**
Mirror Polished
Polyglass

**Refrigeración Interior**
Internal Cooling
Lubrification interne

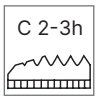
**SÍMBOLOS CARACTERÍSTICAS HERRAMIENTA - Tool Characteristics Symbols -** Symboles caractéristiques outils

## ESCARIADO-AVELLANADO - Reaming-Countersinking-Counterboring - Alesage-Fraisage




**Ángulo Avellanado**
Countersinking-Counterboring Angle
Angle de fraisage

## ROSCADO - Threading - Taraudage



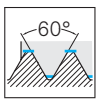

**Tipo Entrada Macho**
Tap Point Type
Type d'entrée de taraud

**Entrada GUN**
GUN Chamfer
Entrée GUN

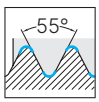
**Ranuras Rectas**
Straight Slots
Denture droite

**Ángulo de Hélice**
Helix Angle
Angle d'hélice

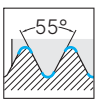
**Ranuras Exteriores Refrigeración**
External Cooling Slots
Rainures extérieurs refroidissement




**Rosca Standard**
Standard Thread
Filetage standard




**Rosca de tubo cilíndrica**
Straight Pipe Thread
Filetage tubes cylindriques




**Rosca Whitworth cilíndrica**
Straight Whitworth Thread
Filetage Whitworth cylindrique

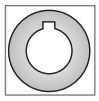
# ÍNDICE SÍMBOLOS
Symbol Index
Index de symboles

**SÍMBOLOS CARACTERÍSTICAS HERRAMIENTA - Tool Characteristics Symbols -** Symboles caractéristiques outils

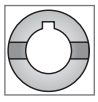
## FRESADO - Milling - Fraisage

**Dentado Alterno**
Staggered Teeth
Denture alternée

**Dentado Recto**
Straight Teeth
Denture droite



**Chavetero Longitudinal**
Longitudinal Keyway
Rainure longitudinal



**Chavetero Longitudinal y Transversal**
Drive Slot & Keyway
Rainure longitudinal et transversale

**Mecanizado piezas 3D**
For 3D-printed metal parts
Fabrication additive de métaux 3D

**Dentado Fresado**
Milled Teeth
Denture fraisée

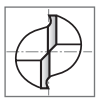
**Dentado Destalonado**
Formed Teeth
Denture détalonnée

**Engranaje**
Gear
Engrenage

**Engranajes Cilíndricos**
Straight Gears
Engrenages cylindriques

**Engranajes Helicoidales**
Helical Gears
Engrenages hélicoïdaux

**1Z= 1 Diente**
1Z= 1 Flute
1Z= 1 Dent

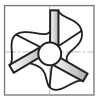


**2Z= 2 Dientes**
2Z= 2 Flutes
2Z= 2 Dents

**3Z= 3 Dientes**
3Z= 3 Flutes
3Z= 3 Dents

**4-5 Z= 4-5 Dientes. Corte al Centro**
4-5 Z= 4-5 Flutes. Center Cutting
4-5 Z= 4-5 Dents. Coupe au centre

**6-8 Z= 6 Dientes. Super-Acabado**
6-8 Z= 6 Flutes. Super-Finishing
6-8 Z= 6 Dents. Super-finition

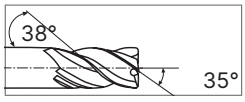


**3Z sin Corte al Centro**
3Z Non-Center-Cutting
3Z sans coupe au centre

**Varios Dientes Sin Corte al Centro**
Non-Center-Cutting Several Flutes
Plusieurs dents sans coupe au centre

**Desplazamiento desigual**
Uneven displacement
Déplacement irrégulier

**1 Z= 1 Diente. Fresa Grabado**
1 Z= 1 Flute. Engraving End Mill
1 Z= 1 Dent. Fraise gravure




**Hélice alterna**
Unequeal Helix
Hélice alternée

**Fresa Frontal Radial**
Radial Head End Mill
Fraise frontal hémisphérique

**Fresa Frontal Recta**
Straight Head End Mill
Fraise frontal droite

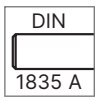
**Fresa Tórica**
Radius End Mill
Fraise torique

**Fresa Frontal Recta con Chaflán 45°**
Straight Head End Mill with 45° Chamfer
Fraise frontal droite avec chamfrein 45°

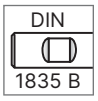
**Pulido Espejo**
Mirror Polished
Polyglass

**Mango Liso MD**
HM Plain Shank
Queue plaine carbure

**Mango Weldon MD**
HM Weldon Shank
Queue Weldon carbure

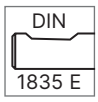



**Mango Liso PMX-HSSE-HSS**
PMX-HSSE-HSS Plain Shank
Queue plaine PMX-HSSE-HSS




**Mango Weldon PMX-HSSE-HSS**
PMX-HSSE-HSS Weldon Shank
Queue Weldon PMX-HSSE-HSS

**Mango WHISTLE NOTCH MD**
HM WHISTLE NOTCH Shank
Queue WHISTLE NOTCH carbure




**Mango WHISTLE NOTCH PMX-HSSE-HSS**
PMX-HSSE-HSS WHISTLE NOTCH Shank
Queue WHISTLE NOTCH PMX-HSSE-HSS

**Dentado Fino**
Fine Teeth
Denture fine

**Dentado Grueso**
Coarse Teeth
Denture grosse

**Fresado trocoidal**
Trochoidal milling
Fraisage trochoïdal

**1/4 radio**
1/4 radius
1/4 rayon

**Planchas de Aluminio**
Aluminium plates
Plaques d'aluminium

| Identif. Internacional<br>International Identif.<br>Identif. Internationale | Comp. Química<br>Quemical Comp.<br>Comp. Chimique |
|---|---|

**HSS**

| | |
|---|---|
| **AISI: M-2*** | **C** |
| **DIN: 1.3343*** | **Cr** |
| **AFNOR: Z85WDCV*** | **W** |
| **EN: HS 6-5-2*** | **V** |
| **UNE: F-5603*** | **Mo** |
| ***(o similares** / or similar / où similaires) | |

**HSS-XT**

| |
|---|
| **Aleación especial**<br>Special alloy<br>Alliage spécial |

**HSSE 5%Co**

| | |
|---|---|
| **AISI: M-35 *** | **C** |
| **DIN: 1.3243** | **Cr** |
| **AFNOR: Z85WDKCV** | **W** |
| **EN: HS 6-5-2-5** | **V** |
| **UNE: F-5613** | **Mo** |
| | **Co** |
| ***(o similares** / or similar / où similaires) | |

**HSSE 8%Co**

| | |
|---|---|
| **AISI: M-42*** | **C** |
| **DIN: 1.3247** | **Cr** |
| **AFNOR: Z110DKCWY** | **W** |
| **EN: HS 2-9-1-8** | **V** |
| **UNE: F-5617** | **Mo** |
| | **Co** |
| ***(o similares** / or similar / où similaires) | |

**PMX**

| |
|---|
| **AISI: ASP***<br>**This is a brandname belonging to Erasteel** |
| **C: 1,60% / Cr: 4,80% / W: 10,50%**<br>**V: 5,00% / Mo: 2,00% / Co: 8,00%** |
| ***(ó equivalentes)**<br>*(or equivalents) *(Où Similaires) |

**MD/HM Carbure Micrograno**

| **Mat: Micrograno** | |
|---|---|
| **Comp.** | **WC 89,3, Co 10%, 0,7 (Nb-Ti-Ta)** |
| **Grano/**Grain/Grain | **Muy Fino**<br>Very Fine<br>Très fine |
| **Dureza/**Hardness/Dureté | **1700 HV** |
| **Resist. Rotura**<br>Breaking Resist.<br>Résistance ruptures | **3.800 N/mm2** |

**MD/HM Carbure Micrograno+**

| **Mat: Micrograno +** | |
|---|---|
| **Comp.** | **WC 89,3, Co 6%, 0,7 (Nb-Ti-Ta)** |
| **Grano/**Grain/Grain | **Muy Fino**<br>Very Fine<br>Très fine |
| **Dureza/**Hardness/Dureté | **1820 HV** |
| **Resist. Rotura**<br>Breaking Resist.<br>Résistance ruptures | **3.600 N/mm2** |

**MD/HM Carbure Grano UF**

| **Mat: Grano UF** | |
|---|---|
| **Comp.** | **WC 85,6, Ti/Ta (Ni) C 0,9, Co 12%** |
| **Grano/**Grain/Grain | **Ultrafino /** Ultrafine/<br>Ultrafin |
| **Dureza/**Hardness/Dureté | **1750 HV** |
| **Resist. Rotura**<br>Breaking Resist.<br>Résistance ruptures | **4.200 N/mm²** |

ALTIN

| **Nitruro de Aluminio-Titanio**<br>**Aluminum-Titanium Nitride**<br>Nitrure de Aluminium-Titanium | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **3.300±300** |
| **Oxidación**<br>Oxidation / Oxidation | **800°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0,70** |
| **Color** / Colour / Couleur:<br>**Antracita** / Anthracite / Anthracite | |

BORDEAUX

| **Base TiAlCrN**<br>**TiAlCrN base**<br>Base TiAlCrN | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **2.850** |
| **Oxidación**<br>Oxidation / Oxidation | **800°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0,25** |
| **Color** / Colour / Couleur:<br>**Rosado cobrizo** / Copper Pink / Rose cuivré | |

CARBEX

| **Base Carbono**<br>**Carbon Base**<br>Base Carbone | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **5.000** |
| **Oxidación**<br>Oxidation / Oxidation | **500°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **< 0,15** |
| **Color** / Colour / Couleur:<br>**Gris Oscuro** / Dark Grey / Gris Foncé | |

CROMAX

| **Base AlCrN**<br>**AlCrN Base**<br>Base AlCrN | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **3.200** |
| **Oxidación**<br>Oxidation / Oxidation | **1.100°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0,35** |
| **Color** / Colour / Couleur:<br>**Gris Brillante** / Shinning Grey / Gris Clair | |

DIAMAX

| **Diamante Nanocristalino**<br>**Nanocrystalline Diamond**<br>Diamant nanocristallin | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **10.000** |
| **Oxidación**<br>Oxidation / Oxidation | **800-850°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **-** |
| **Color** / Colour / Couleur:<br>**Negro** / Black / Noir | |

HARD

| **Hard - TIALN + WC/C**<br>**Hard - TIALN + WC/C**<br>Hard - TIALN + WC/C | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **3.000** |
| **Oxidación**<br>Oxidation / Oxidation | **800°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0,15-0,20** |
| **Color** / Colour / Couleur:<br>**Gris oscuro** / Dark Grey / Gris Foncé | |

IKRA

| **Base AlTiN**<br>**AlTiN Base**<br>Base AlTiN | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **3.500±300** |
| **Oxidación**<br>Oxidation / Oxidation | **1000°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0,35** |
| **Color** / Colour / Couleur:<br>**Gris** / Grey / Gris | |

IRIS

| **Base Carbono ta-C**<br>**Carbon ta-C Base**<br>Base Carbone ta-C | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **> 6.500** |
| **Oxidación**<br>Oxidation / Oxidation | **> 500°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0,30-1,50** |
| **Color** / Colour / Couleur:<br>**Arco Iris** / Rainbow / Arc-en-ciel | |

NITREX

| **Nitruro de Aluminio-Titanio**<br>**Aluminium-Titanium Nitride**<br>Nitrure d´Aluminium-Titanium | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **3.300±300** |
| **Oxidación**<br>Oxidation / Oxidation | **800°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0,70** |
| **Color** / Colour / Couleur:<br>**Antracita** / Anthracite / Anthracite | |

SUA

| **Nitruro de Titanio Silicio**<br>**Titanium Silicon Nitride**<br>Nitrure de Silicium-Titanium | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **3.500±300** |
| **Oxidación**<br>Oxidation / Oxidation | **1000-1100°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0,45** |
| **Color** / Colour / Couleur:<br>**Cobre** / Copper / Cuivre | |

TIALCN

| **Carbonitruro de Titanio-Aluminio**<br>**Titanium Aluminium Carbonitride**<br>Carbo Nitrure d´Aluminium-Titanium | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **3.200** |
| **Oxidación**<br>Oxidation / Oxidation | **900°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0.4** |
| **Color** / Colour / Couleur:<br>**Oro rosa** / Pink gold / Or rose | |

TIALN

| **Nitruro de Titanio-Aluminio**<br>**Titanium Aluminium Nitride**<br>Nitrure de d´Aluminium-Titanium | |
|---|---|
| **Dureza/**Hardness/Dureté<br>**HV(0,05)** | **3.000±500** |
| **Oxidación**<br>Oxidation / Oxidation | **800-900°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0,45** |
| **Adecuado para Uso en Seco**<br>Appropiate for Dry Use<br>Parfait usinage sans refroidir | |
| **Color** / Colour / Couleur:<br>**Violeta-Gris** / Violet-Grey / Violet-Gris | |

TIALN-TOP

| **Carbo-Nitruro de Aluminio-Titanio**<br>**Titanium-Aluminium Carbo-Nitride**<br>Carbo-Nitrure d´Aluminium-Titanium | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **3.300** |
| **Oxidación**<br>Oxidation / Oxidation | **900°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0,30-0,35** |
| **Color** / Colour / Couleur:<br>**Violeta-Gris** / Violet-Grey / Violet-Gris | |

TIALSIN

| **Nitruro de Titanio**<br>**Titanium Nitride**<br>Nitrure de Titanium | |
|---|---|
| **Dureza/**Hardness/Dureté<br>**HV(0,05)** | **3.500±500** |
| **Oxidación** / Oxidation /<br>Oxidation | **900°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0,45** |
| **Adecuado para Uso en Seco**<br>Appropiate for Dry Use<br>Parfait usinage sans refroidir | |
| **Color** / Colour / Couleur:<br>**Antracita** / Anthracite / Anthracite | |

TICN

| **Carbo-Nitruro de Titanio**<br>**Titanium Carbo-Nitride**<br>Carbonitrure de Titanium | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **3.500±500** |
| **Oxidación**<br>Oxidation / Oxidation | **400°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient/Coéficient<br>Friction | **0,20** |
| **Color** / Colour / Couleur:<br>**Gris Azulado-Antracita** / Bluish-Anthracite<br>Grey / Gris Bleu Anthracite | |

TIN

| **Nitruro de Titanio**<br>**Titanium Nitride**<br>Nitrure de Titanium | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **2.300** |
| **Oxidación**<br>Oxidation / Oxidation | **600°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0,40** |
| **Color /** Colour / Couleur:<br>**Oro /** Gold / Or | |

X-AlCr

| **Base ALCR Multicapa**<br>**Multi-layered AlCr Base**<br>Base AlCr Multicouche | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **3.000** |
| **Oxidación**<br>Oxidation / Oxidation | **1.100°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0,25** |
| **Color /** Colour / Couleur:<br>**Cobre /** Copper / Cuivre | |

ZIRKONIO

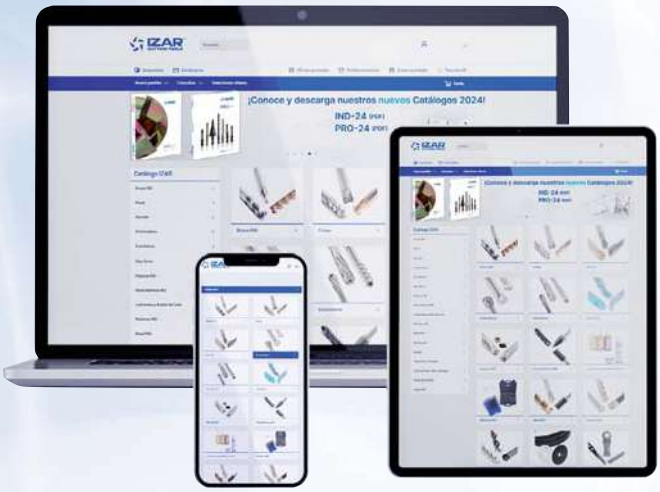
| **Nitruro de Zirconio**<br>**Zirkonium Nitride**<br>Nitrure de Zirkonium | |
|---|---|
| **Dureza /** Hardness / Dureté<br>**HV(0,05)** | **2.300±200** |
| **Oxidación**<br>Oxidation / Oxidation | **660-1.100°C** |
| **Coeficiente Fricción**<br>Rubbing Coefficient<br>Coéficient Friction | **0,50** |
| **Color /** Colour / Couleur:<br>**Amarillo pálido /** Pale Yellow / Jaune pâle | |

Matières premières de qualité supérieure

izartool.com/fr

IZAR CUTTING TOOLS

# Nuevo Portal de compras
# New Shopping site
# Nouveau site d'achat



**Accede a todo el catálogo en un click**

**Encuentra fácilmente la herramienta que necesitas**

**Ahorra tiempo automatizando gestiones**

**Consulta stocks, accede y descarga facturas, pedidos, etc...**

**Access the entire catalogue in one click**

**Easily find the tool you need**

**Save time by automating procedures**

**Check stocks, access and download invoices, orders, etc...**

Accédez à l'intégralité du catalogue en un click

Trouvez facilement l'outil dont vous avez besoin

Gagnez du temps en automatisant les procédures

Vérifiez le stocks, accédez et téléchargez les factures,commandes, etc...

## CONDICIONES GENERALES VENTA

1. **CONDICIONES DE PAGO**
   Giro a 30 días f.f. NETO.

2. **VENCIMIENTOS FIJOS**
   En caso de fechas fijas de pago que rebasen los plazos estipulados giraremos a la fecha fijada pero inmediata anterior, según corresponda, siendo el plazo máximo en todo caso de 60 días, fecha factura o envío.

3. **SEGURO**
   Las mercancías viajarán por exclusiva cuenta y riesgo del comprador, siendo siempre a cargo del mismo la prima del seguro que se realice, en los casos que el cliente desee asegurarla.

4. **RECLAMACIONES**
   Se atenderán aquellas reclamaciones que se planteen dentro de los 8 días siguientes a la recepción del material no aceptando ninguna devolución sin el previo conocimiento de Fábrica.

5. **DEVOLUCIONES**
   Sólo se aceptarán las devoluciones por defecto de fabricación o error atribuible a IZAR CUTTING TOOLS S.A.L. No se aceptarán devoluciones sin previa autorización de Fábrica o de nuestro delegado o representante. Las devoluciones serán a portes pagados e irán acompañadas de la factura original. No se admitirán devoluciones procedentes de promociones ni en estuches defectuosos. Toda devolución originará una nota de cargo por el 20 % de su valor en concepto de manipulación e inspección de control de calidad.

6. **CONDICIONALIDAD**
   La aceptación de las mercancías sin el rechazo inmediato por parte del comprador supone la aprobación de estas condiciones generales de venta y su modificación sólamente tendrá validez si consta por escrito la conformidad de IZAR CUTTING TOOLS S.A.L.

7. **I.V.A.**
   Los precios están sujetos al Impuesto sobre el Valor Añadido, siendo a cargo del cliente el recargo correspondiente.

8. **GARANTÍAS**
   Todas las herramientas están garantizadas contra cualquier defecto de fabricación y materiales, sin responsabilizarse Fábrica de la utilización inadecuada de las mismas. En todo caso, nuestra responsabilidad estará limitada al valor de la herramienta suministrada.
   Nos reservamos el derecho de modificar, sin previo aviso, las dimensiones, calidades del acero y en general todas las características técnicas de las herramientas. No será sustituida ninguna herramienta sin el informe previo de nuestro Departamento de Control de Calidad.

9. **PORTES**
   Se suministrarán con franquicia de portes todos aquellos envíos cuyo valor neto de factura supere los 180 € netos por cada envío en territorio peninsular e Islas Baleares; 300 € en Canarias, Ceuta, Melilla, Andorra y Portugal. En cualquier caso Fábrica se reserva el derecho de utilizar el medio de envío más económico.
   En las capitales donde Fábrica tenga establecidos depósitos de distribución, esta cláusula se aplicará para las reexpediciones a otras poblaciones de la provincia.

10. **IMPORTE MINÍMO POR PEDIDO**
    Queda establecido como pedido mínimo la cantidad de 60 € netos. Los pedidos inferiores se cobrarán al contado o por reembolso.

11. **RESERVA DE DOMINIO**
    Nuestras ventas se consideran siempre bajo la condición de Reserva de dominio según el artículo 1.506 C.C. hasta que se haya hecho efectivo íntegramente el pago de todo lo adeudado.

12. **JURISDICCIÓN COMPETENTE**
    Para cualquier discrepancia acerca de la interpretación de estas condiciones o litigio por razón de incumplimiento por cualquiera de las partes se someten ambas al fuero de los Juzgados y Tribunales de Bilbao, con renuncia al que pudiera corresponderles.

13. **SISTEMA DE REDONDEO DEL EURO (2 DECIMALES)**
    La empresa aplica en sus sistemas informáticos la normativa legal vigente en esta materia.

## General Sale Conditions

1. **PAYMENT TERMS**
   Payment transfer within 30 days of invoice date. NET.

2. **FIXED DUE DATE**
   In the case of fixed payment dates that exceed the stipulated deadlines we will use the fixed date, but immediately before, when appropriate, with the maximum period in any event being 60 days from the invoice or shipment date.

3. **SAFETY**
   The goods will travel at the sole risk and expense of the buyer, who also is in charge of premium insurance, in cases where the customer wishes to insure them.

4. **COMPLAINTS**
   Complaints made within 8 days of receipt of the material will be addressed, but no returns will be accepted without the prior knowledge of the Factory.

5. **RETURNS**
   Returns will only be accepted if due to manufacturing defects or errors attributable to IZAR CUTTING TOOLS S.A.L. No returns will be accepted without prior authorisation from the Factory or our delegate or representative. Returns must be via prepaid freight and accompanied by the original invoice. We do not accept returns on promotional products or gift saw blade cases. All returns will incur a debit note of 20% of the product's value for handling purposes and Quality Control inspections.

6. **CONDITIONS**
   Acceptance of the goods without immediate rejection by the buyer implies approval of these general conditions of sale, and any modifications to them shall only be valid if IZAR CUTTING TOOLS S.A.L. agrees in writing.

7. **V.A.T.**
   The prices are subject to Value Added Tax (VAT), while the corresponding surcharge is the customer's responsibility.

8. **WARRANTIES**
   All tools are guaranteed against any manufacturing and material defect, and IZAR cannot be held responsible for any improper use of the tools. In all cases, IZAR's liability is limited to the value of the supplied tool.
   We reserve the right to modify the dimensions, quality of steel and the general technical characteristics of the tools without prior notice. No tool can be replaced without a prior report from our Quality Control Department.

9. **SHIPPING**
   Shipments with carriage paid will be provided for all orders with a net invoice value exceeding €180 net per shipment in the mainland and the Balearic Islands; €300 in the Canary Islands, Ceuta, Melilla, and Andorra. In any case, IZAR reserves the right to use the most economical shipping method. In cities where IZAR has established distribution depots, this clause will apply to re-shipping to other towns in the province.

10. **MINIMUM ORDER AMOUNT**
    The minimum order amount is €60 net. Orders priced lower than this will require cash on delivery or be refunded.

11. **TITLE RESERVATION**
    Our sales are always considered to be subject to reserved property rights according to Article 1506 of the Spanish Civil Code until all due payments have been made in full.

12. **COMPETENT JURISDICTION**
    To resolve any discrepancy regarding the interpretation of these conditions, or any litigation due to a breach by either party, both parties shall submit to the jurisdiction of the Courts and Tribunals of Bilbao, waiving any other jurisdiction to which they may otherwise be entitled.

13. **EURO ROUNDING SYSTEM (2 DECIMALS)**
    The company applies the legal regulations in force regarding this matter in its IT systems.

## Conditions Générales de Vente

1. **CONDITIONS DE PAIEMENT**
   Les paiements s´effectuent à 30 jours.

2. **ECHEANCES**
   Quelle que soit la date fixée pour le paiement des factures, celui ci doit être effectué au maximum 60 jours après l'envoi ou la date de facture.

3. **ASSURANCE**
   Le risque lié à l´envoi des marchandises est assumé exclusivement par l´acheteur, toute latitude lui étant laissée s´il désire les assurer.

4. **RECLAMATIONS**
   Seront prises en compte les réclamations portées à la connaissance de IZAR dans un délai de 8 jours suivant la réception des marchandises. Aucun retour ne sera accepté si cette condition préliminaire n´est pas satisfaite.

5. **RETOURS**
   Seront acceptés les retours de marchandises pour défaut de fabrication ou erreur imputable à IZAR. Ne sera accepté aucun retour de marchandises sans accord préalable de notre part ou de notre représentant.
   Les retours s´effectueront port payé et seront accompagnés de la facture originale. En aucun cas ne seront acceptés les retours de marchandises liées à des promotions ou en emballages défectueux. Les avoirs seront minorés de 20% de la valeur de la marchandise pour manipulation et inspection du contrôle de qualité.

6. **CONDITIONNALITE**
   L´acceptation des marchandises de la part de l´acheteur implique l´acceptation de ces conditions générales de vente et leur modification ne sera valable qu´après approbation écrite de la part de IZAR.

7. **T.V.A.**
   Les prix ne sont pas assujettis à la Taxe sur la Valeur Ajoutée.

8. **GARANTIES**
   Tous les outils sont garantis contre les défauts de fabrication, IZAR ne pouvant en aucun cas être rendu responsable en cas d´utilisation inadéquate de ceux-ci. En tout état de cause, notre responsabilité se limitera à la valeur de l´outil fourni.
   Nous nous réservons le droit de modifier, sans information préalable, les dimensions, qualités d´acier et en général toutes les caractéristiques techniques des outils. Aucun outil ne sera remplacé sans l´avis préalable de notre département de contrôle de qualité.

9. **PORTS**
   Seront expédiées en franco de port en France Métropolitaine toutes les commandes dont le montant net dépasse où est égal à 300 €. IZAR se réserve le droit d´utiliser le moyen de transport le plus économique.

10. **MONTANT MINIMUM DES COMMANDES**
    Le montant minimum des commandes est de 60 € nets.

11. **RESERVE DE PROPRIETE**
    IZAR conserve tous les droits de propriété sur ses ventes jusqu'au paiement intégral des sommes dues.

12. **JURIDICTION COMPETENTE**
    Tout litige relatif à l´interprétation de ces conditions ou au manquement de l´une des parties à ses obligations est de la compétence du Tribunal de Commerce de Bilbao.

13. **ARRONDI DE L'EURO (2 DECIMALES)**
    L'entreprise utilise pour son système informatique la norme légale en vigueur sur ce sujet.

**NOTAS**
Notes

**NOTAS**
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