

A close-up, high-contrast photograph of the tip of a metal drill bit. The bit is angled, showing its sharp edges and the flutes that run down its length. The lighting is dramatic, coming from the side, which highlights the metallic texture and the sharp point of the bit against a dark background.

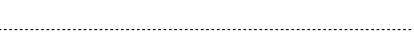
Taladrado >  
Perçage  
Drilling

**Перыс**

**Brocas Metal Duro / Forets Carbure / Hard Metal Drill-bits**

|          |       |             |       |                                                                                    |                                                                                                                                                                                          |              |    |
|----------|-------|-------------|-------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----|
| 1175     | HM-MD | DIN 6537 S  | TIALN |   | 3XD   DIN 6535 HA  | P M<br>K S   | 24 |
| 1176     | HM-MD | DIN 6537 S  | TIALN |   | 3XD   DIN 6535 HA  | P M K<br>S H | 25 |
| 1177     | HM-MD | DIN 6537 L  | TIALN |   | 5XD   DIN 6535 HA  | P M K<br>S H | 26 |
| 1178     | HM-MD | DIN 6537 EL | TIALN |   | 8XD   DIN 6535 HA  | P M K<br>S H | 27 |
| NEW 1184 | HM-MD |             | TIALN |   | 12XD   DIN 6535 HA | P M<br>K S   | 27 |
| 1182     | HM-MD |             | TIN   |   | 1XD                | H            | 28 |
| 1120     | HM-MD | DIN 6539    |       |   | 2XD                | P M K<br>N S | 29 |
| 1109     | HM-MD | DIN 338N    |       |  | 4XD              | P M K<br>N S | 30 |

**Brocas con mango cilíndrico cortas / Forets à queue cylindrique courtes / Short straight shank drill-bits (DIN 338)**

|        |       |           |     |                                                                                     |                                                                                                                                                                                                                                                                                |          |    |
|--------|-------|-----------|-----|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----|
| 1101   | HSS   | DIN338N   |     |  |                                                                                                      | P K<br>N | 31 |
| 1101/1 | HSS   | DIN338N   |     |  |   LH                                                                                                 | P K<br>N | 33 |
| 1104   | HSS   | DIN338N   |     |  |                                                                                                      | P K<br>N | 33 |
| 1104/9 | HSS   | ANSI      |     |  |                                                                                                      | P K<br>N | 34 |
| 1501   | HSS   |           |     |  |  QUICK CHANGE   | P K<br>N | 34 |
| 1158   | HSS   | DIN338NSP |     |  |                                                                                                      | P K<br>N | 35 |
| 1158/9 | HSS   | DIN338NSP |     |  |                                                                                                      | P K<br>N | 36 |
| 1108   | HSS   | DIN338NSP | TIN |  |                                                                                                      | P K<br>N | 37 |
| 1103   | HSS   | DIN338H   |     |  |                                                                                                      | N        | 38 |
| 1105   | HSSCO | DIN 338N  |     |  |                                                                                                      | P K<br>N | 39 |

**Brocas con mango cilíndrico cortas / Forets à queue cylindrique courtes / Short straight shank drill-bits (DIN 338)**

|          |       |          |       |  |  |            |    |
|----------|-------|----------|-------|--|--|------------|----|
| 1105/9   | HSSCO | DIN 338N |       |  |  | P K<br>N   | 40 |
| 1161     | HSSCO | DIN338N  | TIALN |  |  | P K<br>N   | 41 |
| 1107     | HSSCO | DIN338N  |       |  |  | P K<br>N   | 41 |
| 1107/9   | HSSCO | ANSI     |       |  |  | P K<br>N   | 42 |
| NEW 1187 | HSSCO | DIN338W  |       |  |  | P M<br>N S | 43 |
| 1106     | HSSCO | DIN338W  |       |  |  | M N<br>S   | 44 |
| 1162     | HSSCO | DIN338W  | TIALN |  |  | M N<br>S   | 45 |
| 1159     | HSSCO | DIN338S  |       |  |  | P N        | 46 |
| 1160     | HSSCO | DIN338S  | TIALN |  |  | P N        | 47 |
| 1110     | WIDIA | DIN338N  |       |  |  | P K<br>N   | 48 |

**Brocas con mango cilíndrico largas / Forets à queue cylindrique longues / Long straight shank drill-bits (DIN 340)**

|      |       |           |       |  |  |          |    |
|------|-------|-----------|-------|--|--|----------|----|
| 1112 | HSS   | DIN 340 N |       |  |  | P K<br>N | 49 |
| 1113 | HSSCO | DIN 340 N |       |  |  | P K<br>N | 50 |
| 1114 | HSSCO | DIN 340 S |       |  |  | P N      | 51 |
| 1164 | HSSCO | DIN 340 S | TIALN |  |  | P N      | 52 |

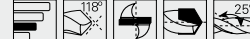
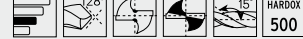
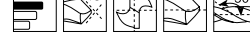
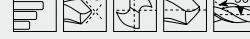
**Brocas con mango cilíndrico extra largas / Forets à queue cylindrique extra longues / Extra-long straight shank drill-bits (DIN 1869)**

|      |       |            |  |  |  |          |    |
|------|-------|------------|--|--|--|----------|----|
| 1115 | HSS   | DIN 1869 N |  |  |  | P K<br>N | 53 |
| 1165 | HSSCO | DIN 1869 S |  |  |  | P N      | 54 |

**Brocas con mango cilíndrico extra cortas / Forets à queue cylindrique extra-courtes / Extra-short straight shank drill-bits (DIN 1897)**

|      |       |            |                                                                                   |                                                                                     |          |    |
|------|-------|------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------|----|
| 1116 | HSS   | DIN 1897 N |  |  | P K<br>N | 55 |
| 1117 | HSS   | DIN 1897 N |  |  | P K<br>N | 56 |
| 1118 | HSSCO | DIN 1897 N |  |  | P K<br>N | 56 |
| 1166 | HSSCO | DIN 1897 S |  |  | P N      | 57 |
| 1167 | HSSCO | DIN 1897 S |  |  | P N      | 58 |

**Brocas con mango cónico / Forets à queue conique / Taper straight shank drill-bits**

|        |       |            |                                                                                     |                                                                                       |          |    |
|--------|-------|------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------|----|
| 1121   | HSS   | DIN 345 N  |    |    | P K<br>N | 59 |
| 1121/9 | HSS   | DIN 345 N  |    |    | P K<br>N | 61 |
| 1123   | WIDIA | DIN 345 N  |  |  | P K      | 62 |
| 1122   | HSSCO | DIN 345 N  |  |  | P K<br>N | 63 |
| 1181   | HSSCO |            |  |  | P S<br>H | 64 |
| 1125   | HSS   | DIN 341 N  |  |  | P K<br>N | 65 |
| 1126   | HSS   | DIN 1870 N |  |  | P K<br>N | 66 |
| 1139   | HSS   | DIN 343    |  |  | P K<br>N | 67 |

**Brocas bidiametrales / Forets biétagés / Two-diameter drill-bits**

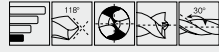
|      |     |          |                                                                                     |                                                                                       |          |    |
|------|-----|----------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------|----|
| 1127 | HSS | DIN 8376 |  |  | P K<br>N | 68 |
| 1128 | HSS | DIN 8374 |  |  | P K<br>N | 68 |
| 1129 | HSS | DIN 8377 |  |  | P K<br>N | 69 |
| 1130 | HSS | DIN 8375 |  |  | P K<br>N | 69 |

**Brocas bidiametrales / Forets biétagés / Two-diameter drill-bits**

|          |       |          |  |                                                                                   |                                                                                     |              |    |
|----------|-------|----------|--|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------|----|
| 1152     | HSS   | DIN 8378 |  |  |  | P K<br>N     | 70 |
| 1153     | HSS   | DIN 8379 |  |  |  | P K<br>N     | 70 |
| NEW 1191 | HSSCO |          |  |  |  | P M K<br>N S | 71 |
| NEW 1192 | HSSCO |          |  |  |  | P M K<br>N S | 71 |

**Brocas de centrar / Forets à centrer / Centre drill-bits**

|          |       |           |       |                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |    |
|----------|-------|-----------|-------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----|
| 1132     | HSS   | DIN 333 A |       |    |                                                                                                                                                                                      | P K<br>N       | 72 |
| NEW 1188 | HSS   | DIN 333 A | TiN   |    |                                                                                                                                                                                      | P K<br>N       | 72 |
| NEW 1193 | HM-MD | DIN 333 A |       |    |                                                                                                                                                                                      | P M K<br>N S H | 73 |
| 1133     | HSS   | DIN 333 A |       |  |                                                                                                                                                                                | P K<br>N       | 73 |
| 1135     | HSS   | DIN 333 R |       |  |                                                                                                                                                                                | P K<br>N       | 74 |
| 1137     | HSS   | DIN 333 B |       |  |                                                                                                                                                                                | P K<br>N       | 74 |
| 1138     | HSSCO |           |       |  |                                                                                                                                                                                                                                                                     | P M K<br>N S   | 75 |
| 1155     | HSSCO |           |       |  |                                                                                                                                                                                                                                                                     | P M K<br>N S   | 75 |
| NEW 1189 | HSSCO |           | TiN   |  |                                                                                                                                                                                                                                                                     | P M K<br>N S   | 76 |
| NEW 1190 | HSSCO |           | TiN   |  |                                                                                                                                                                                                                                                                     | P M K<br>N S   | 76 |
| 1179     | HM-MD |           |       |  |      | P M K<br>N S   | 77 |
| 1180     | HM-MD |           |       |  |      | P M K<br>N S   | 77 |
| NEW 1185 | HM-MD |           | TiAlN |  |      | P M K<br>N S   | 78 |
| NEW 1186 | HM-MD |           | TiAlN |  |      | P M K<br>N S   | 78 |

|          |       |           |       |                                                                                   |                                                                                     |   |    |
|----------|-------|-----------|-------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---|----|
| 1119     | HSSCO | DIN 1897N |       |  |  | P | 79 |
| NEW 1194 | HSSCO | DIN 1897N | TiAlN |  |  | P | 79 |

**Brocas fresa / Forets fraiseur / Mill drills**

|      |     |  |     |                                                                                   |                                                                                     |     |    |
|------|-----|--|-----|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----|----|
| 5114 | HSS |  |     |  |  | P N | 80 |
| 5115 | HSS |  | TiN |  |  | P N | 80 |

**Accesorios / Accessoires / Accessories**

|      |                                                                |  |  |                                                                                      |  |  |    |
|------|----------------------------------------------------------------|--|--|--------------------------------------------------------------------------------------|--|--|----|
| 6110 | Espiga / Queue à tenon / Bit shank                             |  |  |     |  |  | 81 |
| 6111 | Casquillo DIN 2185 / Douille de réduction / Drill sleeve       |  |  |    |  |  | 81 |
| 6114 | Contrapunto / Contrepointe / Fixed centre                      |  |  |   |  |  | 81 |
| 6112 | Alargadera / Adaptateur / Extension piece                      |  |  |  |  |  | 82 |
| 6113 | Expulsor / Éjecteur / Ejector                                  |  |  |  |  |  | 82 |
| 6115 | Punto giratorio / Pointe tournante / Revolving lathe centre    |  |  |   |  |  | 83 |
| 6101 | HP1                                                            |  |  |   |  |  | 83 |
| 6120 | HP1-CM                                                         |  |  |  |  |  | 83 |
| 6102 | HP2                                                            |  |  |   |  |  | 84 |
| 6103 | HP3                                                            |  |  |   |  |  | 84 |
| 6122 | Afilador de Brocas / Affûteuses forets / Twist Drill Sharpener |  |  |   |  |  | 85 |
| 6123 | Porta / Mandrins / Chuck                                       |  |  |   |  |  | 85 |
| 6124 | Muela / Meule / Wheel                                          |  |  |   |  |  | 85 |

|                                             |                                                                                    |  |    |
|---------------------------------------------|------------------------------------------------------------------------------------|--|----|
| <b>Estuches / Coffrets / Sets</b>           |   |  | 86 |
| <b>Expositores / Presentoirs / Displays</b> |  |  | 90 |





FICHE TECHNIQUE FORETS SPECIAUX / TECHNICAL ENQUIRY FOR SPECIAL DRILL BITS

Fecha / Date: .....

Empresa / Entreprise / Company: ..... Contacto / Contact: .....

Dirección / Adresse / Address: ..... Población / Ville / Town: .....

Tel / Fax: ..... E-mail: .....

TRABAJO A REALIZAR / TRAVAIL DEMANDE / REQUESTED WORK

Material / Matière / Material: ..... Norma / Norme / Norm: .....

Dureza / Durété / Hardness: ..... HB ..... HRc ..... Resistencia / Résistance / Resistance: ..... N/mm<sup>2</sup>

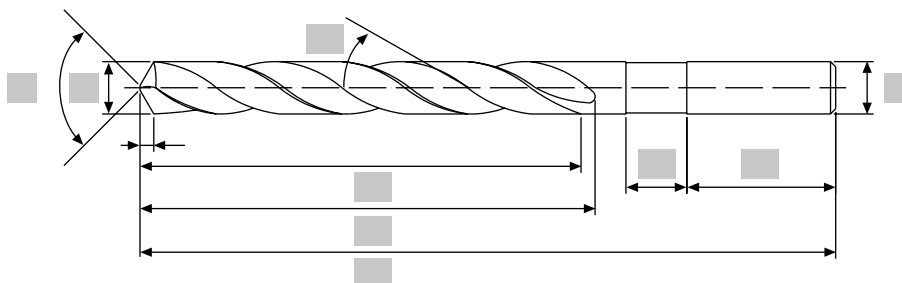
Tipo viruta: ☐ Corta ☐ Larga ☐ Polvo  
Type copeau: Courte Longue Poussière  
Shaving: Short Long Powder

Máquina / Machine: ..... Refrigerante / Réfrigérant / Coolant: .....

Posición / Position: ☐ Horizontal ☐ Vertical ☐ V. Corte ☐ V. avance  
V. Coupe Avance  
Cutting Speed Feed

HERRAMIENTA / OUTIL / TOOL

Descripción / Description: ..... Cantidad / Quantité / Quantity: .....



Mango: ☐ Cilíndrico ☐ Weldon ☐ Cónico ☐ Rebajado  
Queue: Cylindrique Weldon Conique Réduite  
Shank: Straight Weldon Taper Reduced

Afilado: ☐ Convencional ☐ Corrección de labios ☐ Split Point ☐ Puntos soldadura ☐ Placa carburo  
Affûtage: Normal Correction de lèvres Affûtage en croix Points de soudure plaque carbure  
Sharpened: Convencional Lip correction Split Point Welding points Carbide sheet

Material / Matière / Material: ☐ HSS ☐ HSSE ☐ HM ☐ HSS-HM

Superficie / Surface: ☐ Brillante ☐ Negra ☐ Recubrimiento  
Brillant Noire Revêtement  
Brilliant Black Coating

COMENTARIOS / COMMENTAIRES/ COMMENTS: .....

.....  
.....  
.....



# TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE



$$r.p.m. = \frac{V_c \times 1.000}{\pi \times \phi}$$

|                         |       |       |       |       |       |        |      |         |
|-------------------------|-------|-------|-------|-------|-------|--------|------|---------|
| Ref. / Réf. / Ref.      | 1175  | 1176  | 1177  | 1178  | 1184  | 1182   | 1120 | 1109    |
| Prof. / Prof./Depth     | 3xd   | 3xd   | 5xd   | 8xd   | 12xd  | 1Xd    | 2xd  | 4xd     |
| Punta/Poin/Point        | 140°  | 140°  | 140°  | 140°  | 140°  | 120°   | 118° | 118°    |
| Refrig./Réfrig./Cooling | No    | Si    | Si    | Si    | Si    | No     | No   | No      |
| Mat.                    | HM    | HM    | HM    | HM    | HM    | HM     | HM   | HM      |
| Rec./Rev./Coat.         | TIALN | TIALN | TIALN | TIALN | TIALN | TIN    |      |         |
| DIN                     | 6537  | 6537  | 6537  | 6537  | -     | -      | 6539 | 338     |
| Gama/Gamme/Range        | 3-20  | 3-20  | 3-20  | 3-16  | 3-16  | M3-M12 | 2-13 | 2-10,20 |
| Pag.                    | 24    | 25    | 26    | 27    | 27    | 28     | 29   | 30      |

| Avance/Feed (mm/rpm) |         |           |           |           |           |           | Vc (m/min) |         |         |         |        |         |         |
|----------------------|---------|-----------|-----------|-----------|-----------|-----------|------------|---------|---------|---------|--------|---------|---------|
| Mat.                 | Ø2      | Ø5        | Ø10       | Ø15       | Ø20       |           |            |         |         |         |        |         |         |
| P.1                  | <600    | 0,10-0,14 | 0,20-0,28 | 0,30-0,45 | 0,38-0,55 | 0,48-0,68 | 80-110     | 90-120  | 90-120  | 90-120  | 70-90  | 40-70   | 40-70   |
| P.2                  | <800    | 0,08-0,12 | 0,16-0,24 | 0,25-0,38 | 0,32-0,48 | 0,40-0,60 | 40-80      | 50-90   | 50-90   | 50-90   | 40-80  | 30-60   | 30-60   |
| P.3                  | <1000   | 0,06-0,10 | 0,12-0,20 | 0,20-0,32 | 0,25-0,40 | 0,30-0,50 | 35-75      | 40-85   | 40-85   | 40-85   | 35-55  | 25-50   | 25-50   |
| P.4                  | <1200   | 0,04-0,08 | 0,08-0,16 | 0,12-0,26 | 0,15-0,32 | 0,18-0,40 | 30-50      | 35-55   | 35-55   | 35-55   | 30-50  | 20-40   | 20-40   |
| P.5                  | <1400   | 0,03-0,06 | 0,06-0,12 | 0,08-0,20 | 0,10-0,25 | 0,12-0,30 | 25-40      | 30-45   | 30-45   | 30-45   | 25-40  | 15-25   | 15-25   |
| M.1                  | <950    | 0,04-0,08 | 0,08-0,16 | 0,12-0,26 | 0,15-0,32 | 0,18-0,40 | 35-75      | 40-85   | 40-85   | 40-85   | 35-55  | 20-25   | 20-25   |
| M.2                  |         | 0,04-0,08 | 0,08-0,16 | 0,12-0,26 | 0,15-0,32 | 0,18-0,40 | 35-75      | 40-85   | 40-85   | 40-85   | 35-55  | 20-25   | 20-25   |
| M.3                  | <1200   | 0,03-0,06 | 0,06-0,12 | 0,08-0,20 | 0,10-0,25 | 0,12-0,30 |            | 35-55   | 35-55   | 35-55   |        |         |         |
| M.4                  |         | 0,03-0,06 | 0,06-0,12 | 0,08-0,20 | 0,10-0,25 | 0,12-0,30 |            | 30-45   | 30-45   | 30-45   |        |         |         |
| K.1                  | <500    | 0,08-0,12 | 0,16-0,24 | 0,25-0,38 | 0,32-0,48 | 0,40-0,60 | 100-130    | 120-150 | 120-150 | 120-150 | 90-120 | 50-70   | 50-70   |
| K.2                  |         | 0,08-0,12 | 0,16-0,24 | 0,25-0,38 | 0,32-0,48 | 0,40-0,60 | 60-80      | 70-90   | 70-90   | 70-90   | 60-80  |         |         |
| K.3                  | <800    | 0,06-0,10 | 0,12-0,20 | 0,20-0,32 | 0,25-0,40 | 0,30-0,50 | 80-110     | 90-120  | 90-120  | 90-120  | 70-90  | 40-50   | 40-50   |
| K.4.1                |         | 0,06-0,10 | 0,12-0,20 | 0,20-0,32 | 0,25-0,40 | 0,30-0,50 | 70-90      | 80-110  | 80-110  | 80-110  | 60-80  |         |         |
| K.4.2                | <1400   | 0,03-0,06 | 0,06-0,12 | 0,08-0,20 | 0,10-0,25 | 0,12-0,30 | 40-60      | 50-70   | 50-70   | 50-70   | 30-50  |         |         |
| N.1.1                | Al      | 0,08-0,12 | 0,16-0,24 | 0,25-0,38 | 0,32-0,48 | 0,40-0,60 |            |         |         |         |        | 100-140 | 100-140 |
| N.1.2                |         | 0,08-0,12 | 0,16-0,24 | 0,25-0,38 | 0,32-0,48 | 0,40-0,60 |            |         |         |         |        | 70-100  | 70-100  |
| N.1.3                |         | 0,08-0,12 | 0,16-0,24 | 0,25-0,38 | 0,32-0,48 | 0,40-0,60 |            |         |         |         |        | 60-80   | 60-80   |
| N.2.1                | Cu      | 0,06-0,10 | 0,12-0,20 | 0,20-0,32 | 0,25-0,40 | 0,30-0,50 |            |         |         |         |        | 40-70   | 40-70   |
| N.2.2                |         | 0,06-0,10 | 0,12-0,20 | 0,20-0,32 | 0,25-0,40 | 0,30-0,50 |            |         |         |         |        | 40-70   | 40-70   |
| N.2.3                |         | 0,06-0,10 | 0,12-0,20 | 0,20-0,32 | 0,25-0,40 | 0,30-0,50 |            |         |         |         |        | 30-60   | 30-60   |
| N.2.4                | Mg/Zn   | 0,04-0,08 | 0,08-0,16 | 0,12-0,26 | 0,15-0,32 | 0,18-0,40 |            |         |         |         |        | 25-50   | 25-50   |
| N.3.1                |         | 0,06-0,10 | 0,12-0,20 | 0,20-0,32 | 0,25-0,40 | 0,30-0,50 |            |         |         |         |        | 30-60   | 30-60   |
| N.4.1                |         | 0,06-0,10 | 0,12-0,20 | 0,20-0,32 | 0,25-0,40 | 0,30-0,50 |            |         |         |         |        | 40-70   | 40-70   |
| N.4.2                | Plastic |           |           |           |           |           |            |         |         |         |        |         |         |
| N.4.3                |         |           |           |           |           |           |            |         |         |         |        |         |         |
| S.1.1                | Ni      | 0,03-0,05 | 0,05-0,08 | 0,08-0,12 | 0,12-0,16 | 0,16-0,20 | 20-25      | 25-30   | 25-30   | 25-30   | 20-25  | 10-15   | 10-15   |
| S.1.2                |         | 0,03-0,05 | 0,05-0,08 | 0,08-0,12 | 0,12-0,16 | 0,16-0,20 |            | 20-25   | 20-25   | 20-25   | 15-20  |         |         |
| S.2.1                | Ti      | 0,04-0,08 | 0,08-0,16 | 0,12-0,26 | 0,15-0,32 | 0,18-0,40 | 35-75      | 40-85   | 40-85   | 40-85   |        | 15-25   | 15-25   |
| S.2.2                |         | 0,03-0,05 | 0,05-0,08 | 0,08-0,12 | 0,12-0,16 | 0,16-0,20 | 25-35      | 30-40   | 30-40   | 30-40   |        | 10-15   | 10-15   |
| S.2.3                |         | 0,03-0,05 | 0,05-0,08 | 0,08-0,12 | 0,12-0,16 | 0,16-0,20 | 20-25      | 25-30   | 25-30   | 25-30   |        |         |         |
| H.1                  | 50 HRC  | 0,03-0,06 | 0,06-0,12 | 0,08-0,20 | 0,10-0,25 | 0,12-0,30 | 25-35      | 30-40   | 30-40   | 30-40   |        | 25-30   |         |
| H.2                  | 55 HRC  | 0,01-0,04 | 0,04-0,08 | 0,06-0,10 | 0,08-0,12 | 0,10-0,18 | 15-25      | 20-35   | 20-35   | 20-35   |        | 15-25   |         |
| H.3                  | 60 HRC  | 0,01-0,04 | 0,04-0,08 | 0,06-0,10 | 0,08-0,12 | 0,10-0,18 |            | 15-25   | 15-25   | 15-25   |        | 10-15   |         |

● Optima / Optimum ○ Alternativo / Alternative

# TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE

$$r.p.m.= \frac{V_c \times 1.000}{\pi \times \phi}$$



| Ref./ Réf. / Ref.  | 1101    | 1101/1 | 1104  | 1104/9      | 1501 | 1158 | 1158/9   | 1108 | 1103 | 1105    | 1105/9   | 1161  |
|--------------------|---------|--------|-------|-------------|------|------|----------|------|------|---------|----------|-------|
| DIN                | 338     | 338    | 338   | ANSI        | 338  | 338  | 338      | 338  | 338  | 338     | 338      | 338   |
| Punta/Poin/Point   | 118°    | 118°   | 118°  | 118°        | 118° | 118° | 118°     | 118° | 118° | 135°    | 135°     | 135°  |
| Ejec./Exéc./Exec.  | N       | N      | N     | N           | N    | NSP  | NSP      | NSP  | N    | NSP     | NSP      | NSP   |
| Hel./Hél./Spiral   | 30°     | 30°-LH | 30°   | 30°         | 30°  | 30°  | 30°      | 30°  | 18°  | 30°     | 30°      | 30°   |
| Mat.               | HSS     | HSS    | HSS   | HSS         | HSS  | HSS  | HSS      | HSS  | HSS  | HSSCO   | HSSCO    | HSSCO |
| Rec./Rev./Coat.    |         |        |       |             |      |      |          | TIN  |      |         |          | TIALN |
| Prof./ Prof./Depth | 5xD     | 5xD    | 3xD   | 3xD         | 5xD  | 5xD  | 5xD      | 5xD  | 5xD  | 5xD     | 5xD      | 5xD   |
| Gama/Gamme/Range   | 0,20-20 | 2-12   | 10-30 | 17/32-1"1/8 | 3-10 | 1-20 | 1/16-1/2 | 1-13 | 1-13 | 0,50-20 | 1/16-1/2 | 2-13  |
| Pag.               | 31      | 33     | 33    | 34          | 34   | 35   | 36       | 37   | 38   | 39      | 40       | 41    |

| Avance/Feed (mm/rpm) |         |           |           |           |           |           | Vc (m/min) |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
|----------------------|---------|-----------|-----------|-----------|-----------|-----------|------------|-------|-------|-------|-------|-------|-------|-------|--|-------|-------|-------|--|--|--|--|
| Mat.                 | Ø2      | Ø5        | Ø10       | Ø15       | Ø20       |           |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| P.1                  | <600    | 0,04-0,06 | 0,08-0,12 | 0,20-0,30 | 0,30-0,40 | 0,35-0,46 | 25-35      | 25-35 | 25-35 | 25-35 | 25-35 | 25-35 | 25-35 | 35-45 |  | 25-35 | 25-35 | 35-50 |  |  |  |  |
| P.2                  | <800    | 0,02-0,06 | 0,08-0,12 | 0,12-0,30 | 0,18-0,40 | 0,22-0,46 | 15-30      | 15-30 | 15-30 | 15-30 | 15-30 | 15-30 | 15-30 | 20-40 |  | 15-30 | 15-30 | 25-45 |  |  |  |  |
| P.3                  | <1000   | 0,02-0,03 | 0,05-0,07 | 0,12-0,18 | 0,18-0,24 | 0,22-0,28 |            |       |       |       |       |       |       | 15-30 |  | 12-20 | 12-20 | 18-30 |  |  |  |  |
| P.4                  | <1200   | 0,01-0,04 | 0,04-0,09 | 0,09-0,18 | 0,12-0,28 | 0,14-0,33 |            |       |       |       |       |       |       |       |  | 6-16  | 6-16  | 10-25 |  |  |  |  |
| P.5                  | <1400   | 0,01-0,04 | 0,04-0,09 | 0,09-0,18 | 0,12-0,28 | 0,14-0,33 |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| M.1                  | <950    | 0,02-0,04 | 0,05-0,09 | 0,18-0,21 | 0,20-0,28 | 0,25-0,33 |            |       |       |       |       |       |       |       |  | 10-14 | 10-14 | 15-20 |  |  |  |  |
| M.2                  |         | 0,01-0,03 | 0,05-0,07 | 0,14-0,18 | 0,20-0,24 | 0,22-0,28 |            |       |       |       |       |       |       |       |  | 8-12  | 8-12  | 12-18 |  |  |  |  |
| M.3                  | <1200   |           |           |           |           |           |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| M.4                  |         |           |           |           |           |           |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| K.1                  | <500    | 0,04-0,06 | 0,08-0,12 | 0,20-0,30 | 0,30-0,40 | 0,35-0,46 | 25-30      | 25-30 | 25-30 | 25-30 | 25-30 | 25-30 | 25-30 | 35-40 |  | 25-30 | 25-30 | 38-45 |  |  |  |  |
| K.2                  |         |           |           |           |           |           |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| K.3                  | <800    | 0,04-0,06 | 0,08-0,12 | 0,20-0,30 | 0,30-0,40 | 0,35-0,46 |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| K.4.1                |         | 0,04-0,06 | 0,05-0,09 | 0,18-0,21 | 0,20-0,28 | 0,25-0,33 | 12-16      | 12-16 | 12-16 | 12-16 | 12-16 | 12-16 | 12-16 | 15-20 |  | 12-16 | 12-16 | 18-25 |  |  |  |  |
| K.4.2                | <1400   | 0,02-0,04 | 0,05-0,09 | 0,18-0,21 | 0,20-0,28 | 0,25-0,33 |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| N.1.1                | Al      | 0,03-0,05 | 0,08-0,12 | 0,18-0,24 | 0,25-0,32 | 0,30-0,37 |            |       |       |       |       |       |       | 75-90 |  |       |       |       |  |  |  |  |
| N.1.2                |         | 0,02-0,04 | 0,05-0,09 | 0,18-0,21 | 0,20-0,28 | 0,25-0,33 | 50-60      | 50-60 | 50-60 | 50-60 | 50-60 | 50-60 | 50-60 | 65-75 |  | 50-60 | 50-60 | 70-80 |  |  |  |  |
| N.1.3                |         | 0,02-0,04 | 0,05-0,09 | 0,18-0,21 | 0,20-0,28 | 0,25-0,33 |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| N.2.1                | Cu      | 0,03-0,05 | 0,08-0,10 | 0,18-0,24 | 0,25-0,32 | 0,30-0,37 |            |       |       |       |       |       |       | 40-60 |  |       |       |       |  |  |  |  |
| N.2.2                |         | 0,03-0,05 | 0,08-0,10 | 0,18-0,24 | 0,25-0,32 | 0,30-0,37 |            |       |       |       |       |       |       | 25-60 |  |       |       |       |  |  |  |  |
| N.2.3                |         | 0,02-0,04 | 0,05-0,09 | 0,18-0,21 | 0,20-0,28 | 0,25-0,33 | 30-60      | 30-60 | 30-60 | 30-60 | 30-60 | 30-60 | 30-60 | 40-70 |  | 30-60 | 30-60 | 45-80 |  |  |  |  |
| N.2.4                |         |           |           |           |           |           |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| N.3.1                | Mg/Zn   | 0,02-0,04 | 0,05-0,09 | 0,18-0,21 | 0,20-0,28 | 0,25-0,33 |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| N.4.1                | Plastic | 0,03-0,04 | 0,06-0,07 | 0,12-0,13 | 0,16-0,17 | 0,25-0,26 | 20-25      | 20-25 | 20-25 | 30-35 |       | 20-25 | 20-25 | 20-25 |  | 20-25 | 20-25 | 30-35 |  |  |  |  |
| N.4.2                |         | 0,03-0,04 | 0,06-0,07 | 0,12-0,13 | 0,16-0,17 | 0,25-0,26 |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| N.4.3                |         |           |           |           |           |           |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| S.1.1                | Ni      | 0,01-0,03 | 0,03-0,05 | 0,06-0,10 | 0,10-0,14 | 0,16-0,20 |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| S.1.2                |         | 0,01-0,03 | 0,03-0,05 | 0,06-0,10 | 0,10-0,14 | 0,16-0,20 |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| S.2.1                | Ti      | 0,01-0,03 | 0,04-0,06 | 0,08-0,10 | 0,10-0,14 | 0,16-0,20 |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| S.2.2                |         | 0,01-0,03 | 0,03-0,05 | 0,06-0,10 | 0,10-0,14 | 0,16-0,20 |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| S.2.3                |         | 0,01-0,03 | 0,03-0,05 | 0,06-0,10 | 0,10-0,14 | 0,16-0,20 |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| H.1                  | 50 HRC  | 0,02-0,03 | 0,05-0,07 | 0,09-0,13 | 0,14-0,18 | 0,18-0,22 |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| H.2                  | 55 HRC  |           |           |           |           |           |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |
| H.3                  | 60 HRC  |           |           |           |           |           |            |       |       |       |       |       |       |       |  |       |       |       |  |  |  |  |

● Optima / Optimun ○ Alternativo / Alternative

|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1107                                                                              | 1107/9                                                                            | 1187                                                                              | 1106                                                                              | 1162                                                                              | 1159                                                                              | 1160                                                                              | 1110                                                                              | 1112                                                                              | 1113                                                                              | 1114                                                                              | 1164                                                                              | 1115                                                                                | 1165                                                                                | 1116                                                                                | 1117                                                                                | 1118                                                                                | 1166                                                                                | 1167                                                                                |
| 338                                                                               | ANSI                                                                              | 338                                                                               | 338                                                                               | 338                                                                               | 338                                                                               | 338                                                                               | 338                                                                               | 340                                                                               | 340                                                                               | 340                                                                               | 340                                                                               | 1869                                                                                | 1869                                                                                | 1897                                                                                |                                                                                     | 1897                                                                                | 1897                                                                                | 1897                                                                                |
| 135°                                                                              | 135°                                                                              | 135°                                                                              | 135°                                                                              | 135°                                                                              | 135°                                                                              | 135°                                                                              | 118°                                                                              | 118°                                                                              | 135°                                                                              | 135°                                                                              | 135°                                                                              | 118°                                                                                | 135°                                                                                | 118°                                                                                | 118°                                                                                | 135°                                                                                | 135°                                                                                | 135°                                                                                |
| NSP                                                                               | NSP                                                                               | W                                                                                 | W                                                                                 | W                                                                                 | TS                                                                                | TS                                                                                | N                                                                                 | N                                                                                 | NSP                                                                               | TS                                                                                | TS                                                                                | N                                                                                   | TS                                                                                  | N                                                                                   | N                                                                                   | NSP                                                                                 | TS                                                                                  | TS                                                                                  |
| 30°                                                                               | 30°                                                                               | 35°                                                                               | 35°                                                                               | 35°                                                                               | 30°                                                                               | 30°                                                                               | 30°                                                                               | 30°                                                                               | 30°                                                                               | 30°                                                                               | 30°                                                                               | 30°                                                                                 | 30°                                                                                 | 30°                                                                                 | 30°                                                                                 | 30°                                                                                 | 30°                                                                                 | 30°                                                                                 |
| HSSCO                                                                             | HSSCO                                                                             | HSSCO                                                                             | HSSCO                                                                             | HSSCO                                                                             | HSSCO                                                                             | HSSCO                                                                             | HSS WIDIA                                                                         | HSS                                                                               | HSSCO                                                                             | HSSCO                                                                             | HSSCO                                                                             | HSS                                                                                 | HSSCO                                                                               | HSS                                                                                 | HSS                                                                                 | HSSCO                                                                               | HSSCO                                                                               | HSSCO                                                                               |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   | TIALN                                                                             |                                                                                   | TIALN                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | TIALN                                                                               |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     | TIALN                                                                               |
| 5xD                                                                               | 3xD                                                                               | 5xD                                                                               | 5xD                                                                               | 5xD                                                                               | 5xD                                                                               | 5xD                                                                               | 5xD                                                                               | 10xD                                                                              | 10xD                                                                              | 10xD                                                                              | 10xD                                                                              | 15-30xD                                                                             | 15-30xD                                                                             | 3xD                                                                                 | 3xD                                                                                 | 3xD                                                                                 | 3xD                                                                                 | 3xD                                                                                 |
| 10-20                                                                             | 17/32-13/16                                                                       | 1-13                                                                              | 1-13                                                                              | 1-13                                                                              | 2-13                                                                              | 2-13                                                                              | 1,50-20                                                                           | 1-20                                                                              | 2-13                                                                              | 2-13                                                                              | 2-13                                                                              | 2-13                                                                                | 2-12                                                                                | 1-20                                                                                | 2-8                                                                                 | 2-13                                                                                | 2-16                                                                                | 2-16                                                                                |
| 41                                                                                | 42                                                                                | 43                                                                                | 44                                                                                | 45                                                                                | 46                                                                                | 47                                                                                | 48                                                                                | 49                                                                                | 50                                                                                | 51                                                                                | 52                                                                                | 53                                                                                  | 54                                                                                  | 55                                                                                  | 56                                                                                  | 56                                                                                  | 57                                                                                  | 58                                                                                  |
| Vc (m/min)                                                                        |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| 0 25-35                                                                           | 0 25-35                                                                           | ● 35-40                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ● 25-35                                                                           | 0 25-35                                                                           |                                                                                   |                                                                                   | ● 25-35                                                                             |                                                                                     | ● 25-35                                                                             | ● 25-35                                                                             | 0 25-35                                                                             |                                                                                     |                                                                                     |
| ● 15-30                                                                           | ● 15-30                                                                           | ● 30-35                                                                           |                                                                                   |                                                                                   |                                                                                   | ● 15-30                                                                           | ● 25-45                                                                           | ● 25-45                                                                           | ● 15-30                                                                           | ● 15-30                                                                           | ● 15-30                                                                           | ● 25-45                                                                             | ● 15-30                                                                             | ● 15-30                                                                             | ● 15-30                                                                             | ● 15-30                                                                             | ● 15-30                                                                             | ● 25-45                                                                             |
| ● 12-20                                                                           | ● 12-20                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ● 12-20                                                                           | ● 18-30                                                                           | ● 18-30                                                                           | ● 12-20                                                                           | ● 12-20                                                                           | ● 18-30                                                                           |                                                                                     | ● 12-20                                                                             |                                                                                     |                                                                                     | ● 12-20                                                                             | ● 12-20                                                                             | ● 18-30                                                                             |
| ● 6-16                                                                            | ● 6-16                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ● 6-16                                                                            | ● 10-25                                                                           | ● 10-25                                                                           |                                                                                   | ● 6-16                                                                            | ● 6-16                                                                            | ● 10-25                                                                             |                                                                                     |                                                                                     |                                                                                     | ● 6-16                                                                              | ● 6-16                                                                              | ● 10-25                                                                             |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0 6-9                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| 0 10-14                                                                           | 0 10-14                                                                           | ● 10-14                                                                           | ● 10-14                                                                           | ● 15-20                                                                           | 0 10-14                                                                           | 0 15-20                                                                           |                                                                                   |                                                                                   | 0 10-14                                                                           | 0 10-14                                                                           | 0 15-20                                                                           |                                                                                     | 0 10-14                                                                             |                                                                                     |                                                                                     | 0 10-14                                                                             | 0 10-14                                                                             | 0 15-20                                                                             |
| 0 8-12                                                                            | 0 8-12                                                                            | ● 8-12                                                                            | ● 8-12                                                                            | ● 12-18                                                                           | 0 8-12                                                                            | 0 12-18                                                                           |                                                                                   |                                                                                   | 0 8-12                                                                            | 0 8-12                                                                            | 0 12-18                                                                           |                                                                                     | 0 8-12                                                                              |                                                                                     |                                                                                     | 0 8-12                                                                              | 0 8-12                                                                              | 0 12-18                                                                             |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| ● 25-30                                                                           | ● 25-30                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ● 25-30                                                                           | ● 25-30                                                                           |                                                                                   |                                                                                   | ● 25-30                                                                             |                                                                                     | ● 25-30                                                                             | ● 25-30                                                                             | ● 25-30                                                                             | ● 25-30                                                                             |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ● 30-40                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| ● 12-16                                                                           | ● 12-16                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ● 12-16                                                                           | ● 12-16                                                                           |                                                                                   |                                                                                   | ● 12-16                                                                             |                                                                                     | ● 12-16                                                                             | ● 12-16                                                                             | ● 12-16                                                                             |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ● 15-20                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   | 0 60-80                                                                           | 0 60-80                                                                           | 0 85-100                                                                          | 0 60-80                                                                           | 0 85-100                                                                          |                                                                                   |                                                                                   |                                                                                   | 0 60-80                                                                           | 0 85-100                                                                          |                                                                                     | 0 60-80                                                                             |                                                                                     |                                                                                     |                                                                                     | 0 60-80                                                                             | 0 85-100                                                                            |
| 0 50-60                                                                           | 0 50-60                                                                           | 0 50-60                                                                           | 0 50-60                                                                           | 0 75-90                                                                           | 0 50-60                                                                           | 0 75-90                                                                           |                                                                                   | 0 50-60                                                                           | 0 50-60                                                                           | 0 50-60                                                                           | 0 75-90                                                                           | 0 50-60                                                                             | 0 50-60                                                                             | 0 50-60                                                                             | 0 50-60                                                                             | 0 50-60                                                                             | 0 50-60                                                                             | 0 75-90                                                                             |
|                                                                                   |                                                                                   | ● 30-40                                                                           | ● 30-40                                                                           | ● 45-60                                                                           | ● 30-40                                                                           | ● 45-60                                                                           |                                                                                   |                                                                                   |                                                                                   | ● 30-40                                                                           | ● 45-60                                                                           |                                                                                     | ● 30-40                                                                             |                                                                                     |                                                                                     |                                                                                     | ● 30-40                                                                             | ● 45-60                                                                             |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
| ● 30-60                                                                           | ● 30-60                                                                           | 0 50-70                                                                           | 0 50-70                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   | ● 30-60                                                                           | ● 30-60                                                                           |                                                                                   |                                                                                   | ● 30-60                                                                             |                                                                                     | ● 30-60                                                                             | ● 30-60                                                                             | ● 30-60                                                                             |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   | 0 50-70                                                                           | 0 50-70                                                                           | 0 75-95                                                                           | ● 50-70                                                                           | ● 70-90                                                                           |                                                                                   |                                                                                   |                                                                                   | ● 50-70                                                                           | ● 70-90                                                                           |                                                                                     | ● 50-70                                                                             |                                                                                     |                                                                                     |                                                                                     | ● 50-70                                                                             | ● 70-90                                                                             |
| 0 20-25                                                                           | 0 20-25                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 0 30-35                                                                           | 0 20-25                                                                           | 0 20-25                                                                           |                                                                                   |                                                                                   | 0 20-25                                                                             |                                                                                     | 0 20-25                                                                             | 0 20-25                                                                             | 0 20-25                                                                             | 0 20-25                                                                             |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   | ● 8-10                                                                            | ● 8-10                                                                            | ● 12-15                                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |

● Optima / Optimun ○ Alternativo / Alternative

# TABLA DE APLICACIONES GUIDE D'APPLICATION / APPLICATION GUIDE



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

| Ref./ Réf. / Ref.  | 1121 | 1121/9 | 1122  | 1123      | 1181  | 1125 | 1126    | 1139  |
|--------------------|------|--------|-------|-----------|-------|------|---------|-------|
| DIN                | 345  | 345    | 345   | 345       | 128°  | 341  | 1870    | 343   |
| Punta/Poin/Point   | 118° | 118°   | 135°  | 118°      | 128°  | 118° | 118°    | 120°  |
| Ejec./Exéc./Exec.  | N    | N      | NSP   | N         | N     | N    | N       | N     |
| Hel./Hél./Spiral   | 30°  | 30°    | 30°   | 30°       | 15°   | 30°  | 30°     | 30°   |
| Mat.               | HSS  | HSS    | HSSCO | HSS WIDIA | HSSCO | HSS  | HSS     | HSS   |
| Rec./Rev./Coat.    |      |        |       |           |       |      |         |       |
| Prof./ Prof./Depth | 5xD  | 5xD    | 5xD   | 5xD       | 3xD   | 8xD  | 10-15xD | 5xD   |
| Gama/Gamme/Range   | 5-80 | 1/2-2" | 10-40 | 10-30     | 10-50 | 5-40 | 8-50    | 10-40 |
| Pag.               | 59   | 61     | 62    | 63        | 64    | 65   | 66      | 67    |

| Avance/Feed (mm/rpm) |         |           |           |           |           |           | Vc (m/min) |         |         |         |         |         |         |
|----------------------|---------|-----------|-----------|-----------|-----------|-----------|------------|---------|---------|---------|---------|---------|---------|
| Mat.                 | Ø2      | Ø5        | Ø10       | Ø15       | Ø20       |           |            |         |         |         |         |         |         |
| P.1                  | <600    | 0,04-0,06 | 0,08-0,12 | 0,20-0,30 | 0,30-0,40 | 0,35-0,46 | ● 25-35    | ● 25-35 | ● 25-35 |         | ● 25-35 | ● 25-35 | ● 25-35 |
| P.2                  | <800    | 0,02-0,06 | 0,08-0,12 | 0,12-0,30 | 0,18-0,40 | 0,22-0,46 | ● 15-30    | ● 15-30 | ● 15-30 | ● 25-45 | ● 15-30 | ● 15-30 | ● 15-30 |
| P.3                  | <1000   | 0,02-0,03 | 0,05-0,07 | 0,12-0,18 | 0,18-0,24 | 0,22-0,28 |            |         | ○ 12-20 | ○ 18-30 |         |         |         |
| P.4                  | <1200   | 0,01-0,04 | 0,04-0,09 | 0,09-0,18 | 0,12-0,28 | 0,14-0,33 |            |         | ○ 6-16  | ○ 10-25 | ○ 8-10  |         |         |
| P.5                  | <1400   | 0,01-0,04 | 0,04-0,09 | 0,09-0,18 | 0,12-0,28 | 0,14-0,33 |            |         | ○ 6-9   | ○ 6-8   |         |         |         |
| M.1                  | <950    | 0,02-0,04 | 0,05-0,09 | 0,18-0,21 | 0,20-0,28 | 0,25-0,33 |            |         | ○ 8-12  |         |         |         | ○ 8-12  |
| M.2                  |         | 0,01-0,03 | 0,05-0,07 | 0,14-0,18 | 0,20-0,24 | 0,22-0,28 |            |         | ○ 10-14 |         |         |         | ○ 10-14 |
| M.3                  | <1200   |           |           |           |           |           |            |         |         |         |         |         |         |
| M.4                  |         |           |           |           |           |           |            |         |         |         |         |         |         |
| K.1                  | <500    | 0,04-0,06 | 0,08-0,12 | 0,20-0,30 | 0,30-0,40 | 0,35-0,46 | ● 25-30    | ● 25-30 | ● 25-30 |         | ● 25-30 | ● 25-30 | ● 25-30 |
| K.2                  |         |           |           |           |           |           |            |         |         |         |         |         |         |
| K.3                  | <800    | 0,04-0,06 | 0,08-0,12 | 0,20-0,30 | 0,30-0,40 | 0,35-0,46 |            |         | ○ 30-40 |         |         |         |         |
| K.4.1                |         | 0,04-0,06 | 0,05-0,09 | 0,18-0,21 | 0,20-0,28 | 0,25-0,33 | ● 12-16    | ● 12-16 | ● 12-16 |         | ● 12-16 | ● 12-16 | ● 12-16 |
| K.4.2                | <1400   | 0,02-0,04 | 0,05-0,09 | 0,18-0,21 | 0,20-0,28 | 0,25-0,33 |            |         | ○ 15-20 |         |         |         |         |
| N.1.1                | Al      | 0,03-0,05 | 0,08-0,12 | 0,18-0,24 | 0,25-0,32 | 0,30-0,37 |            |         |         |         |         |         |         |
| N.1.2                |         | 0,02-0,04 | 0,05-0,09 | 0,18-0,21 | 0,20-0,28 | 0,25-0,33 | ○ 50-60    | ○ 50-60 | ○ 50-60 |         | ○ 50-60 | ○ 50-60 | ○ 50-60 |
| N.1.3                |         | 0,02-0,04 | 0,05-0,09 | 0,18-0,21 | 0,20-0,28 | 0,25-0,33 |            |         |         |         |         |         |         |
| N.2.1                | Cu      | 0,03-0,05 | 0,08-0,10 | 0,18-0,24 | 0,25-0,32 | 0,30-0,37 |            |         |         |         |         |         |         |
| N.2.2                |         | 0,03-0,05 | 0,08-0,10 | 0,18-0,24 | 0,25-0,32 | 0,30-0,37 |            |         |         |         |         |         |         |
| N.2.3                |         | 0,02-0,04 | 0,05-0,09 | 0,18-0,21 | 0,20-0,28 | 0,25-0,33 | ● 30-60    | ● 30-60 | ● 30-60 |         | ● 30-60 | ● 30-60 | ● 30-60 |
| N.2.4                |         |           |           |           |           |           |            |         |         |         |         |         |         |
| N.3.1                | Mg/Zn   | 0,02-0,04 | 0,05-0,09 | 0,18-0,21 | 0,20-0,28 | 0,25-0,33 |            |         |         |         |         |         |         |
| N.4.1                | Plastic | 0,03-0,04 | 0,06-0,07 | 0,12-0,13 | 0,16-0,17 | 0,25-0,26 | ○ 20-25    | ○ 20-25 | ○ 20-25 | ○ 30-35 | ○ 20-25 | ○ 20-25 | ○ 20-25 |
| N.4.2                |         | 0,03-0,04 | 0,06-0,07 | 0,12-0,13 | 0,16-0,17 | 0,25-0,26 |            |         | ○ 15-20 |         |         |         |         |
| N.4.3                |         |           |           |           |           |           |            |         |         |         |         |         |         |
| S.1.1                | Ni      | 0,01-0,03 | 0,03-0,05 | 0,06-0,10 | 0,10-0,14 | 0,16-0,20 |            |         |         | ○ 5-7   |         |         |         |
| S.1.2                |         | 0,01-0,03 | 0,03-0,05 | 0,06-0,10 | 0,10-0,14 | 0,16-0,20 |            |         |         | ○ 4-6   |         |         |         |
| S.2.1                | Ti      | 0,01-0,03 | 0,04-0,06 | 0,08-0,10 | 0,10-0,14 | 0,16-0,20 |            |         |         |         |         |         |         |
| S.2.2                |         | 0,01-0,03 | 0,03-0,05 | 0,06-0,10 | 0,10-0,14 | 0,16-0,20 |            |         |         |         |         |         |         |
| S.2.3                |         | 0,01-0,03 | 0,03-0,05 | 0,06-0,10 | 0,10-0,14 | 0,16-0,20 |            |         |         |         |         |         |         |
| H.1                  | 50 HRC  | 0,02-0,03 | 0,05-0,07 | 0,09-0,13 | 0,14-0,18 | 0,18-0,22 |            |         |         | ○ 4-6   |         |         |         |
| H.2                  | 55 HRC  |           |           |           |           |           |            |         |         |         |         |         |         |
| H.3                  | 60 HRC  |           |           |           |           |           |            |         |         |         |         |         |         |

● Optima / Optimun ○ Alternativo / Alternative



A series of horizontal dotted lines spanning the width of the page, providing a template for writing or drawing.

# TABLA DE APLICACIONES

## GUIDE D'APPLICATION / APPLICATION GUIDE

$$r.p.m. = \frac{V_c \times 1.000}{\pi \times \phi}$$



| Ref./ Réf. / Ref.  | 1127   | 1128   | 1129   | 1130   | 1152   | 1153   | 1191   | 1192   | 1132   | 1188 |
|--------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|
| DIN                | 8376   | 8374   | 8377   | 8375   | 8378   | 8379   |        |        | 333    | 333  |
| Punta/Poin/Point   | 180°   | 90°    | 180°   | 90°    | 90°    | 90°    | 90°    | 90°    | 60°    | 60°  |
| Ejec./Exéc./Exec.  |        |        |        |        |        |        |        |        | A      | A    |
| Hel./Hél./Spiral   |        |        |        |        |        |        |        |        |        |      |
| Mat.               | HSS    | HSS    | HSS    | HSS    | HSS    | HSS    | HSSCo  | HSSCo  | HSS    | HSS  |
| Rec./Rev./Coat.    |        |        |        |        |        |        |        |        |        | TIN  |
| Prof./ Prof./Depth |        |        |        |        |        |        |        |        |        |      |
| Gama/Gamme/Range   | M3-M10 | M3-M10 | M8-M20 | M5-M10 | M3-M12 | M8-M20 | M3-M12 | M4-M10 | 1-12,5 | 1-12 |
| Pag.               | 68     | 68     | 69     | 69     | 70     | 70     | 71     | 71     | 72     | 72   |

| Avance/Feed (mm/rpm) HSS/HSSCo - HM=x2 |         |           |           |           |           |           | Vc (m/min) |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------------------------------|---------|-----------|-----------|-----------|-----------|-----------|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Mat.                                   | Ø2      | Ø5        | Ø10       | Ø15       | Ø20       |           |            |       |       |       |       |       |       |       |       |       |       |       |       |       |
| P.1                                    | <600    | 0.04-0.06 | 0.08-0.12 | 0.20-0.30 | 0.30-0.40 | 0.35-0.46 | 20-25      | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 35-40 |
| P.2                                    | <800    | 0.02-0.06 | 0.08-0.12 | 0.12-0.30 | 0.18-0.40 | 0.22-0.46 | 15-20      | 15-20 | 15-20 | 15-20 | 15-20 | 15-20 | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 30-35 |
| P.3                                    | <1000   | 0.02-0.03 | 0.05-0.07 | 0.12-0.18 | 0.18-0.24 | 0.22-0.28 | 8-10       | 8-10  | 8-10  | 8-10  | 8-10  | 8-10  | 12-18 | 12-18 | 12-18 | 12-18 | 12-18 | 12-18 | 12-18 | 12-16 |
| P.4                                    | <1200   | 0.01-0.04 | 0.04-0.09 | 0.09-0.18 | 0.12-0.28 | 0.14-0.33 |            |       |       |       |       |       | 4-8   | 4-8   | 4-8   | 4-8   | 4-8   | 4-8   | 4-8   |       |
| P.5                                    | <1400   | 0.01-0.04 | 0.04-0.09 | 0.09-0.18 | 0.12-0.28 | 0.14-0.33 |            |       |       |       |       |       |       |       |       |       |       |       |       |       |
| M.1                                    | <950    | 0.02-0.04 | 0.05-0.09 | 0.18-0.21 | 0.20-0.28 | 0.25-0.33 |            |       |       |       |       |       | 4-10  | 4-10  | 4-10  | 4-10  | 4-10  | 4-10  | 4-10  |       |
| M.2                                    |         | 0.01-0.03 | 0.05-0.07 | 0.14-0.18 | 0.20-0.24 | 0.22-0.28 |            |       |       |       |       |       | 4-10  | 4-10  | 4-10  | 4-10  | 4-10  | 4-10  | 4-10  |       |
| M.3                                    | <1200   | 0.03-0.04 | 0.04-0.06 | 0.08-0.10 | 0.12-0.14 | 0.16-0.18 |            |       |       |       |       |       |       |       |       |       |       |       |       |       |
| M.4                                    |         | 0.02-0.03 | 0.03-0.05 | 0.06-0.08 | 0.10-0.12 | 0.14-0.16 |            |       |       |       |       |       |       |       |       |       |       |       |       |       |
| K.1                                    | <500    | 0.04-0.06 | 0.08-0.12 | 0.20-0.30 | 0.30-0.40 | 0.35-0.46 | 30-35      | 30-35 | 30-35 | 30-35 | 30-35 | 30-35 | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 30-35 |
| K.2                                    |         |           |           |           |           |           | 30-35      | 30-35 | 30-35 | 30-35 | 30-35 | 30-35 |       |       |       |       |       |       |       | 30-35 |
| K.3                                    | <800    | 0.04-0.06 | 0.08-0.12 | 0.20-0.30 | 0.30-0.40 | 0.35-0.46 | 25-30      | 25-30 | 25-30 | 25-30 | 25-30 | 25-30 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 20-30 |
| K.4.1                                  |         | 0.04-0.06 | 0.05-0.09 | 0.18-0.21 | 0.20-0.28 | 0.25-0.33 | 25-30      | 25-30 | 25-30 | 25-30 | 25-30 | 25-30 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 20-30 |
| K.4.2                                  | <1400   | 0.02-0.04 | 0.05-0.09 | 0.18-0.21 | 0.20-0.28 | 0.25-0.33 | 14-18      | 14-18 | 14-18 | 14-18 | 14-18 | 14-18 |       |       |       |       |       |       |       |       |
| N.1.1                                  | Al      | 0.03-0.05 | 0.08-0.12 | 0.18-0.24 | 0.25-0.32 | 0.30-0.37 |            |       |       |       |       |       | 50-80 | 50-80 | 50-80 | 50-80 | 50-80 | 50-80 | 50-80 |       |
| N.1.2                                  |         | 0.02-0.04 | 0.05-0.09 | 0.18-0.21 | 0.20-0.28 | 0.25-0.33 |            |       |       |       |       |       | 30-50 | 30-50 | 30-50 | 30-50 | 30-50 | 30-50 | 30-50 |       |
| N.1.3                                  |         | 0.02-0.04 | 0.05-0.09 | 0.18-0.21 | 0.20-0.28 | 0.25-0.33 | 20-25      | 20-25 | 20-25 | 20-25 | 20-25 | 20-25 | 15-30 | 15-30 | 15-30 | 15-30 | 15-30 | 15-30 | 15-30 | 20-30 |
| N.2.1                                  | Cu      | 0.03-0.05 | 0.08-0.10 | 0.18-0.24 | 0.25-0.32 | 0.30-0.37 |            |       |       |       |       |       | 25-35 | 25-35 | 25-35 | 25-35 | 25-35 | 25-35 | 25-35 |       |
| N.2.2                                  |         | 0.03-0.05 | 0.08-0.10 | 0.18-0.24 | 0.25-0.32 | 0.30-0.37 | 30-35      | 30-35 | 30-35 | 30-35 | 30-35 | 30-35 | 40-60 | 40-60 | 40-60 | 40-60 | 40-60 | 40-60 | 40-60 | 35-40 |
| N.2.3                                  |         | 0.02-0.04 | 0.05-0.09 | 0.18-0.21 | 0.20-0.28 | 0.25-0.33 | 30-35      | 30-35 | 30-35 | 30-35 | 30-35 | 30-35 | 30-50 | 30-50 | 30-50 | 30-50 | 30-50 | 30-50 | 30-50 |       |
| N.2.4                                  |         |           |           |           |           |           |            |       |       |       |       |       |       |       |       |       |       |       |       |       |
| N.3.1                                  | Mg/Zn   | 0.02-0.04 | 0.05-0.09 | 0.18-0.21 | 0.20-0.28 | 0.25-0.33 |            |       |       |       |       |       | 60-90 | 60-90 | 60-90 | 60-90 | 60-90 | 60-90 | 60-90 |       |
| N.4.1                                  | Plastic | 0.03-0.04 | 0.06-0.07 | 0.12-0.13 | 0.16-0.17 | 0.25-0.26 | 15-20      | 15-20 | 15-20 | 15-20 | 15-20 | 15-20 | 35-70 | 35-70 | 35-70 | 35-70 | 35-70 | 35-70 | 35-70 | 10-15 |
| N.4.2                                  |         | 0.03-0.04 | 0.06-0.07 | 0.12-0.13 | 0.16-0.17 | 0.25-0.26 |            |       |       |       |       |       | 12-24 | 12-24 | 12-24 | 12-24 | 12-24 | 12-24 | 12-24 |       |
| N.4.3                                  |         |           |           |           |           |           |            |       |       |       |       |       |       |       |       |       |       |       |       |       |
| S.1.1                                  | Ni      | 0.01-0.03 | 0.03-0.05 | 0.06-0.10 | 0.10-0.14 | 0.16-0.20 |            |       |       |       |       |       | 4-6   | 4-6   | 4-6   | 4-6   | 4-6   | 4-6   | 4-6   |       |
| S.1.2                                  |         | 0.01-0.03 | 0.03-0.05 | 0.06-0.10 | 0.10-0.14 | 0.16-0.20 |            |       |       |       |       |       | 2-5   | 2-5   | 2-5   | 2-5   | 2-5   | 2-5   | 2-5   |       |
| S.2.1                                  | Ti      | 0.01-0.03 | 0.04-0.06 | 0.08-0.10 | 0.10-0.14 | 0.16-0.20 |            |       |       |       |       |       | 6-10  | 6-10  | 6-10  | 6-10  | 6-10  | 6-10  | 6-10  |       |
| S.2.2                                  |         | 0.01-0.03 | 0.03-0.05 | 0.06-0.10 | 0.10-0.14 | 0.16-0.20 |            |       |       |       |       |       | 4-6   | 4-6   | 4-6   | 4-6   | 4-6   | 4-6   | 4-6   |       |
| S.2.3                                  |         | 0.01-0.03 | 0.03-0.05 | 0.06-0.10 | 0.10-0.14 | 0.16-0.20 |            |       |       |       |       |       | 2-5   | 2-5   | 2-5   | 2-5   | 2-5   | 2-5   | 2-5   |       |
| H.1                                    | 50 HRC  | 0.02-0.03 | 0.05-0.07 | 0.09-0.13 | 0.14-0.18 | 0.18-0.22 |            |       |       |       |       |       |       |       |       |       |       |       |       |       |
| H.2                                    | 55 HRC  |           |           |           |           |           |            |       |       |       |       |       |       |       |       |       |       |       |       |       |
| H.3                                    | 60 HRC  |           |           |           |           |           |            |       |       |       |       |       |       |       |       |       |       |       |       |       |

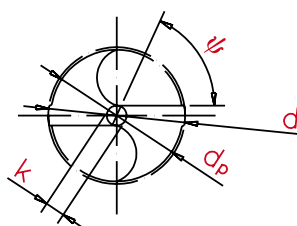
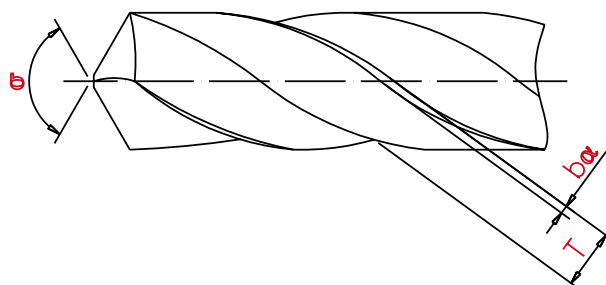
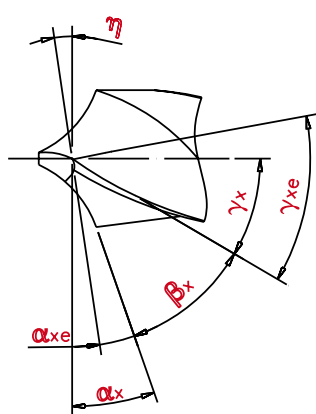
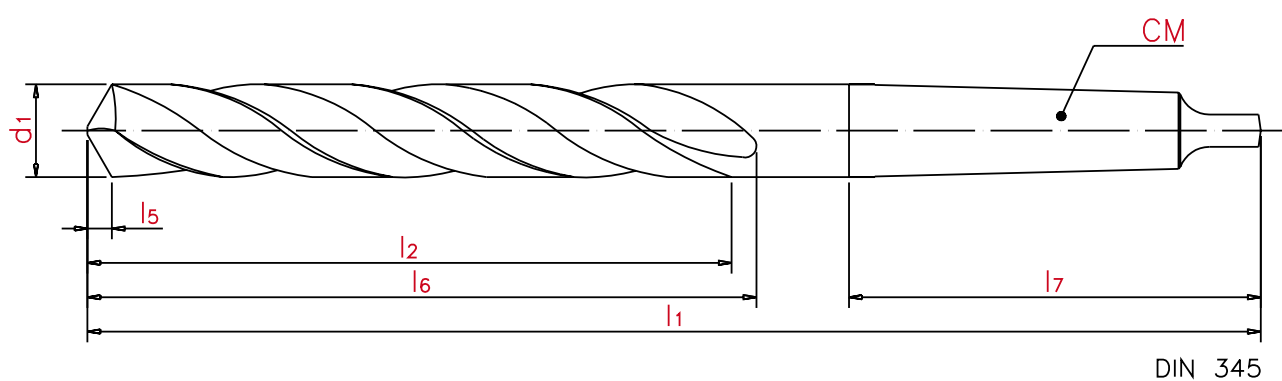
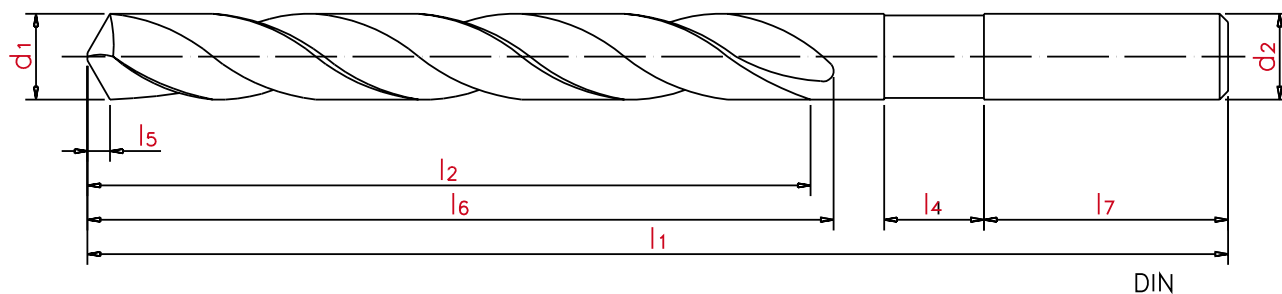
● Optima / Optimun ○ Alternativo / Alternative

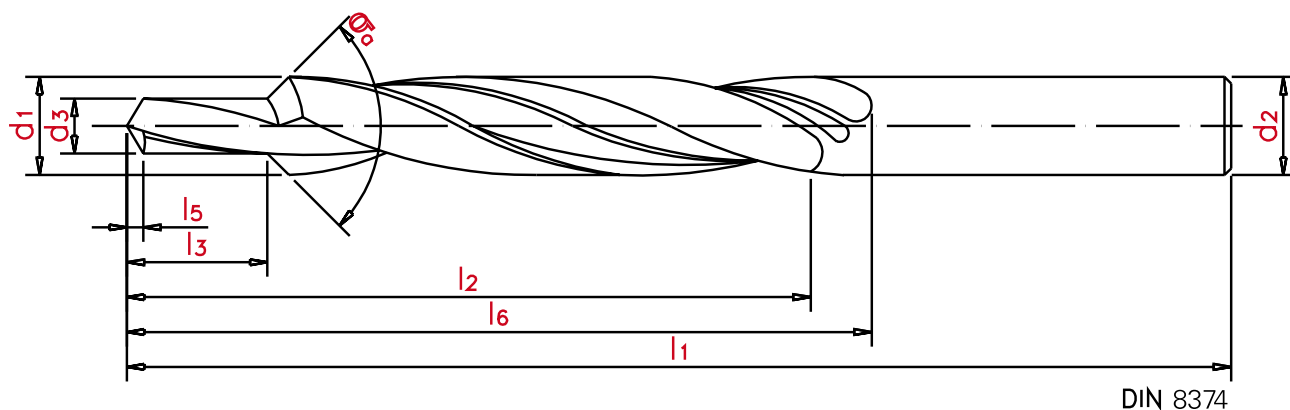
|              |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
|--------------|------------|------------|------------|------------|------------|------------|------------|--------------|--------------|--------------|--------------|------------|------------|------------|------------|
|              |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
| 1193         | 1133       | 1135       | 1137       | 1138       | 1155       | 1189       | 1190       | 1179         | 1180         | 1185         | 1186         | 1119       | 1194       | 5114       | 5115       |
| 333          | 333        | 333        | 333        | CNC        | CNC        | CNC        | CNC        | CNC          | CNC          | CNC          | CNC          | 1897       | 1897       |            |            |
| 60°          | 60°        | Radial     | 60°        | 90°        | 120°       | 90°        | 120°       | 90°          | 120°         | 90°          | 120°         | 118°       | 118°       | 118°       | 118°       |
| A            | A          | R          | B          |            |            |            |            |              |              |              |              |            |            |            |            |
|              |            |            |            |            |            |            |            |              |              |              |              | 30°        | 30°        |            |            |
| HM           | HSS        | HSS        | HSS        | HSSCo      | HSSCo      | HSSCo      | HSSCo      | HM           | HM           | HM           | HM           | HSSCo      | HSSCo      | HSS        | HSS        |
|              |            |            |            |            |            | TIN        | TIN        |              |              | TIAlN        | TIAlN        |            | TIAlN      |            | TIN        |
| 1-6,30       | 1-5        | 1-12,5     | 1-6,30     | 3-20       | 3-20       | 3-20       | 3-20       | 6-12         | 6-12         | 6-12         | 6-12         | 6-10       | 6-10       | 6-8        | 6-8        |
| 73           | 73         | 74         | 74         | 75         | 75         | 76         | 76         | 77           | 77           | 78           | 78           | 79         | 79         | 80         | 80         |
| Vc (m/min)   |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
| 0<br>55-60   | •<br>20-30 | •<br>20-30 | •<br>20-30 | •<br>20-30 | •<br>20-30 | •<br>35-40 | •<br>35-40 | •<br>60-80   | •<br>60-80   | •<br>80-100  | •<br>80-100  | 0<br>25-30 | 0<br>35-40 | •<br>20-25 | •<br>25-35 |
| 0<br>45-60   | •<br>20-25 | •<br>20-25 | •<br>20-25 | •<br>20-25 | •<br>20-25 | •<br>30-35 | •<br>30-35 | •<br>55-70   | •<br>55-70   | •<br>70-90   | •<br>70-90   | 0<br>20-25 | 0<br>30-35 | •<br>10-15 | •<br>15-20 |
| •<br>40-55   | •<br>8-12  | •<br>8-12  | •<br>8-12  | •<br>8-12  | •<br>8-12  | •<br>12-16 | •<br>12-16 | •<br>40-55   | •<br>40-55   | •<br>55-75   | •<br>55-75   | •<br>12-18 | •<br>16-20 |            |            |
| •<br>25-30   |            |            |            | •<br>6-10  | •<br>6-10  | •<br>10-14 | •<br>10-14 | •<br>35-45   | •<br>35-45   | •<br>50-60   | •<br>50-60   | •<br>6-10  | •<br>8-14  |            |            |
| •<br>20-25   |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
| •<br>40-55   |            |            |            | •<br>8-12  | •<br>8-12  | •<br>12-16 | •<br>12-16 | •<br>20-30   | •<br>20-30   | •<br>25-35   | •<br>25-35   |            |            |            |            |
| •<br>40-55   |            |            |            | •<br>6-10  | •<br>6-10  | •<br>10-14 | •<br>10-14 | •<br>15-20   | •<br>15-20   | •<br>20-25   | •<br>20-25   |            |            |            |            |
| •<br>25-30   |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
| •<br>25-30   |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
| •<br>40-55   | •<br>20-25 | •<br>20-25 | •<br>20-25 | •<br>20-25 | •<br>20-25 | •<br>30-35 | •<br>30-35 | •<br>60-80   | •<br>60-80   | •<br>80-100  | •<br>80-100  |            |            |            |            |
| •<br>40-55   | •<br>20-25 | •<br>20-25 | •<br>20-25 | •<br>20-25 | •<br>20-25 | •<br>30-35 | •<br>30-35 | •<br>60-80   | •<br>60-80   | •<br>80-100  | •<br>80-100  |            |            |            |            |
| •<br>35-45   | •<br>15-20 | •<br>15-20 | •<br>15-20 | •<br>15-20 | •<br>15-20 | •<br>20-25 | •<br>20-25 | •<br>40-60   | •<br>40-60   | •<br>55-80   | •<br>55-80   |            |            |            |            |
| •<br>35-45   | •<br>15-20 | •<br>15-20 | •<br>15-20 | •<br>15-20 | •<br>15-20 | •<br>20-25 | •<br>20-25 | •<br>40-60   | •<br>40-60   | •<br>55-80   | •<br>55-80   |            |            |            |            |
| •<br>20-25   |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
| •<br>110-130 |            |            |            |            |            |            |            | •<br>120-160 | •<br>120-160 | •<br>160-200 | •<br>160-200 |            |            |            |            |
| •<br>100-110 |            |            |            |            |            |            |            | •<br>100-130 | •<br>100-130 | •<br>140-180 | •<br>140-180 |            |            |            |            |
| •<br>80-100  | •<br>15-20 | •<br>15-20 | •<br>15-20 | •<br>15-20 | •<br>15-20 | •<br>20-25 | •<br>20-25 | •<br>70-90   | •<br>70-90   | •<br>100-120 | •<br>100-120 |            |            | •<br>15-20 | •<br>20-25 |
| 0<br>40-55   |            |            |            |            |            |            |            | 0<br>60-80   | 0<br>60-80   | 0<br>80-100  | 0<br>80-100  |            |            |            |            |
| •<br>55-65   | •<br>25-30 | •<br>25-30 | •<br>25-30 | •<br>25-30 | •<br>25-30 | •<br>35-40 | •<br>35-40 | •<br>100-120 | •<br>100-120 | •<br>140-160 | •<br>140-160 |            |            |            |            |
| •<br>45-55   |            |            |            |            |            |            |            | •<br>80-100  | •<br>80-100  | •<br>110-140 | •<br>110-140 |            |            |            |            |
| 0<br>25-30   |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
| •<br>100-110 |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
| •<br>150-200 | 0<br>10-15 | 0<br>10-15 | 0<br>10-15 | •<br>25-30 | •<br>25-30 | •<br>35-40 | •<br>35-40 | 0<br>50-70   | 0<br>50-70   | 0<br>50-70   | 0<br>50-70   |            |            | •<br>25-30 | •<br>35-40 |
| •<br>70-100  |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
|              |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
| •<br>20-30   |            |            |            |            |            |            |            | 0<br>10-20   | 0<br>10-20   | 0<br>15-20   | 0<br>15-20   |            |            |            |            |
|              |            |            |            |            |            |            |            | 0<br>8-12    | 0<br>8-12    | 0<br>12-16   | 0<br>12-16   |            |            |            |            |
| •<br>25-30   |            |            |            | •<br>10-12 | •<br>10-12 | •<br>12-16 | •<br>12-16 | •<br>20-30   | •<br>20-30   | •<br>25-35   | •<br>25-35   |            |            |            |            |
| 0<br>25-25   |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
| 0<br>15-20   |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
| •<br>15-20   |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
| •<br>10-15   |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |
| 0<br>4-6     |            |            |            |            |            |            |            |              |              |              |              |            |            |            |            |

● Optima / Optimun ○ Alternativo / Alternative

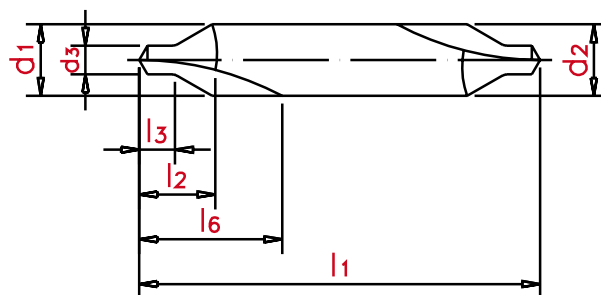








DIN 8374



DIN 333-A

|                                  |                                                                                                                         |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>l1</b>                        | Longitud total / Longueur totale / Total length                                                                         |
| <b>l2</b>                        | Longitud de corte / Longueur de coupe / Length of cut                                                                   |
| <b>l3</b>                        | Longitud de corte del diámetro menor / Longueur de coupe du plus petit diamètre / Length of cut of the smaller diameter |
| <b>l7</b>                        | Longitud del mango-del cono / Longueur de la queue du cône / Length of cone shank                                       |
| <b>l5</b>                        | Longitud de punta / Longueur de pointe / Length of tip                                                                  |
| <b>l6</b>                        | Longitud de ranura / Longueur de rainure / Length of groove                                                             |
| <b>l4</b>                        | Diámetro de broca / Diamètre de foret / Drill-bit diameter                                                              |
| <b>d1</b>                        | Longitud de sangrado / Longueur d'indentation / Bled length                                                             |
| <b>d3</b>                        | Diámetro inicial / Diamètre initial / Initial diameter                                                                  |
| <b>d2</b>                        | Diámetro de mango / Diamètre de queue / Shank diameter                                                                  |
| <b>CM</b>                        | Tamaño del cono morse / Taille du cône morse / Morse taper size                                                         |
| <b>dp</b>                        | Diámetro posterior / Diamètre postérieur / Rear diameter                                                                |
| <b>b<math>\alpha</math></b>      | Ancho de fase / Largeur de phase / Phase width                                                                          |
| <b>T</b>                         | Ancho de alma / Largeur d'âme / Core width                                                                              |
| <b>k</b>                         | Espesor del núcleo / Épaisseur du noyau / Thickness of nucleus                                                          |
| <b><math>\sigma</math></b>       | Ángulo de la punta / Angle de la pointe / Tip angle                                                                     |
| <b><math>\sigma\alpha</math></b> | Ángulo de avellanado / Angle de chanfreinage / Countersink angle                                                        |
| <b><math>\psi</math></b>         | Ángulo de corte transversal / Angle de coupe transversale / Transversal cut angle                                       |
| <b><math>\gamma_{xe}</math></b>  | Ángulo de corte lateral efectivo / Angle de coupe latérale effectif / Effective lateral cut angle                       |
| <b><math>\gamma_x</math></b>     | Ángulo de corte lateral / Angle de coupe latérale / Lateral cut angle                                                   |
| <b><math>\alpha_{xe}</math></b>  | Ángulo de incidencia lateral efectivo / Angle d'incidence latérale effectif / Effective lateral angle of incidence      |
| <b><math>\alpha_x</math></b>     | Ángulo de incidencia lateral / Angle d'incidence latérale / Lateral angle of incidence                                  |
| <b><math>\beta_x</math></b>      | Ángulo ortogonal de la herramienta / Angle orthogonal de l'outil / Orthogonal angle of the tool                         |
| <b><math>\eta</math></b>         | Ángulo del sentido efectivo del corte / Angle du sens effectif de la coupe / Effective direction of cut angle           |

**1175**

**HM-MD DIN 6537 S**

**3XD**



| P      |        |        |        | M     |        | K      |        |        | N  |    |       |         | S     |       | H      |        |        |
|--------|--------|--------|--------|-------|--------|--------|--------|--------|----|----|-------|---------|-------|-------|--------|--------|--------|
| <800   | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500   | <800   | <1.400 | Al | Cu | Mg/Zn | Plastic | Ni    | Ti    | 50 HRC | 55 HRC | 60 HRC |
| ●      | ●      | ●      | ●      | ●     | ●      | ●      | ●      | ●      |    |    |       |         | ○     | ●     | ○      | ○      |        |
| 40-110 | 35-75  | 30-50  | 25-40  | 35-75 |        | 60-100 | 70-110 | 40-60  |    |    |       |         | 20-25 | 20-75 | 25-35  | 15-25  |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø mm | d mm  | €     | L mm  | l mm  |   |
|------|-------|-------|-------|-------|---|
| 3,00 | 6,00  | 34,00 | 62,00 | 20,00 | 1 |
| 3,10 | 6,00  | 34,00 | 62,00 | 20,00 | 1 |
| 3,20 | 6,00  | 34,00 | 62,00 | 20,00 | 1 |
| 3,30 | 6,00  | 34,00 | 62,00 | 20,00 | 1 |
| 3,40 | 6,00  | 34,00 | 62,00 | 20,00 | 1 |
| 3,50 | 6,00  | 34,00 | 62,00 | 20,00 | 1 |
| 3,60 | 6,00  | 34,00 | 62,00 | 20,00 | 1 |
| 3,70 | 6,00  | 34,00 | 62,00 | 20,00 | 1 |
| 3,80 | 6,00  | 34,00 | 66,00 | 24,00 | 1 |
| 3,90 | 6,00  | 34,00 | 66,00 | 24,00 | 1 |
| 4,00 | 6,00  | 34,00 | 66,00 | 24,00 | 1 |
| 4,10 | 6,00  | 34,00 | 66,00 | 24,00 | 1 |
| 4,20 | 6,00  | 34,00 | 66,00 | 24,00 | 1 |
| 4,30 | 6,00  | 34,00 | 66,00 | 24,00 | 1 |
| 4,40 | 6,00  | 34,00 | 66,00 | 24,00 | 1 |
| 4,50 | 6,00  | 34,00 | 66,00 | 24,00 | 1 |
| 4,60 | 6,00  | 34,00 | 66,00 | 24,00 | 1 |
| 4,70 | 6,00  | 34,00 | 66,00 | 24,00 | 1 |
| 4,80 | 6,00  | 34,00 | 66,00 | 28,00 | 1 |
| 4,90 | 6,00  | 34,00 | 66,00 | 28,00 | 1 |
| 5,00 | 6,00  | 34,00 | 66,00 | 28,00 | 1 |
| 5,10 | 6,00  | 34,00 | 66,00 | 28,00 | 1 |
| 5,20 | 6,00  | 34,00 | 66,00 | 28,00 | 1 |
| 5,30 | 6,00  | 34,00 | 66,00 | 28,00 | 1 |
| 5,40 | 6,00  | 34,00 | 66,00 | 28,00 | 1 |
| 5,50 | 6,00  | 34,00 | 66,00 | 28,00 | 1 |
| 5,60 | 6,00  | 34,00 | 66,00 | 28,00 | 1 |
| 5,70 | 6,00  | 34,00 | 66,00 | 28,00 | 1 |
| 5,80 | 6,00  | 34,00 | 66,00 | 28,00 | 1 |
| 5,90 | 6,00  | 34,00 | 66,00 | 28,00 | 1 |
| 6,00 | 6,00  | 34,00 | 66,00 | 28,00 | 1 |
| 6,10 | 8,00  | 46,13 | 79,00 | 34,00 | 1 |
| 6,20 | 8,00  | 46,13 | 79,00 | 34,00 | 1 |
| 6,30 | 8,00  | 46,13 | 79,00 | 34,00 | 1 |
| 6,40 | 8,00  | 46,13 | 79,00 | 34,00 | 1 |
| 6,50 | 8,00  | 46,13 | 79,00 | 34,00 | 1 |
| 6,60 | 8,00  | 46,13 | 79,00 | 34,00 | 1 |
| 6,70 | 8,00  | 46,13 | 79,00 | 34,00 | 1 |
| 6,80 | 8,00  | 46,13 | 79,00 | 34,00 | 1 |
| 6,90 | 8,00  | 46,13 | 79,00 | 34,00 | 1 |
| 7,00 | 8,00  | 46,13 | 79,00 | 34,00 | 1 |
| 7,10 | 8,00  | 46,13 | 79,00 | 41,00 | 1 |
| 7,20 | 8,00  | 46,13 | 79,00 | 41,00 | 1 |
| 7,30 | 8,00  | 46,13 | 79,00 | 41,00 | 1 |
| 7,40 | 8,00  | 46,13 | 79,00 | 41,00 | 1 |
| 7,50 | 8,00  | 46,13 | 79,00 | 41,00 | 1 |
| 7,60 | 8,00  | 46,13 | 79,00 | 41,00 | 1 |
| 7,70 | 8,00  | 46,13 | 79,00 | 41,00 | 1 |
| 7,80 | 8,00  | 46,13 | 79,00 | 41,00 | 1 |
| 7,90 | 8,00  | 46,13 | 79,00 | 41,00 | 1 |
| 8,00 | 8,00  | 46,13 | 79,00 | 41,00 | 1 |
| 8,10 | 10,00 | 61,44 | 89,00 | 47,00 | 1 |

| Ø mm  | d mm  | €      | L mm   | l mm  |   |
|-------|-------|--------|--------|-------|---|
| 8,20  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 8,30  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 8,40  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 8,50  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 8,60  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 8,70  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 8,80  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 8,90  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 9,00  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 9,10  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 9,20  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 9,30  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 9,40  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 9,50  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 9,60  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 9,70  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 9,80  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 9,90  | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 10,00 | 10,00 | 61,44  | 89,00  | 47,00 | 1 |
| 10,10 | 12,00 | 92,69  | 102,00 | 55,00 | 1 |
| 10,20 | 12,00 | 92,69  | 102,00 | 55,00 | 1 |
| 10,30 | 12,00 | 92,69  | 102,00 | 55,00 | 1 |
| 10,40 | 12,00 | 92,69  | 102,00 | 55,00 | 1 |
| 10,50 | 12,00 | 92,69  | 102,00 | 55,00 | 1 |
| 10,60 | 12,00 | 92,69  | 102,00 | 55,00 | 1 |
| 10,70 | 12,00 | 92,69  | 102,00 | 55,00 | 1 |
| 10,80 | 12,00 | 92,69  | 102,00 | 55,00 | 1 |
| 10,90 | 12,00 | 92,69  | 102,00 | 55,00 | 1 |
| 11,00 | 12,00 | 92,69  | 102,00 | 55,00 | 1 |
| 11,50 | 12,00 | 92,69  | 102,00 | 55,00 | 1 |
| 11,80 | 12,00 | 92,69  | 102,00 | 55,00 | 1 |
| 12,00 | 12,00 | 92,69  | 102,00 | 55,00 | 1 |
| 12,50 | 14,00 | 122,81 | 107,00 | 60,00 | 1 |
| 12,80 | 14,00 | 122,81 | 107,00 | 60,00 | 1 |
| 13,00 | 14,00 | 122,81 | 107,00 | 60,00 | 1 |
| 13,50 | 14,00 | 122,81 | 107,00 | 60,00 | 1 |
| 13,80 | 14,00 | 122,81 | 107,00 | 60,00 | 1 |
| 14,00 | 14,00 | 122,81 | 107,00 | 60,00 | 1 |
| 14,50 | 16,00 | 155,19 | 115,00 | 65,00 | 1 |
| 14,80 | 16,00 | 155,19 | 115,00 | 65,00 | 1 |
| 15,00 | 16,00 | 155,19 | 115,00 | 65,00 | 1 |
| 15,80 | 16,00 | 155,19 | 115,00 | 65,00 | 1 |
| 16,00 | 16,00 | 155,19 | 115,00 | 65,00 | 1 |
| 16,50 | 18,00 | 212,63 | 123,00 | 73,00 | 1 |
| 17,00 | 18,00 | 212,63 | 123,00 | 73,00 | 1 |
| 17,50 | 18,00 | 212,63 | 123,00 | 73,00 | 1 |
| 18,00 | 18,00 | 212,63 | 123,00 | 73,00 | 1 |
| 18,50 | 20,00 | 270,06 | 131,00 | 79,00 | 1 |
| 19,00 | 20,00 | 270,06 | 131,00 | 79,00 | 1 |
| 19,50 | 20,00 | 270,06 | 131,00 | 79,00 | 1 |
| 20,00 | 20,00 | 270,06 | 131,00 | 79,00 | 1 |

**1176**

**HM-MD DIN 6537 S**

**3XD**



| P      |        |        |        | M     |        | K      |        |        | N  |    |       |         | S     |       | H      |        |        |
|--------|--------|--------|--------|-------|--------|--------|--------|--------|----|----|-------|---------|-------|-------|--------|--------|--------|
| <800   | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500   | <800   | <1.400 | Al | Cu | Mg/Zn | Plastic | Ni    | Ti    | 50 HRC | 55 HRC | 60 HRC |
| ●      | ●      | ●      | ●      | ●     | ○      | ●      | ●      | ●      |    |    |       |         | ●     | ●     | ●      | ●      | ○      |
| 50-120 | 40-85  | 35-55  | 30-45  | 40-85 | 30-55  | 70-150 | 80-120 | 50-70  |    |    |       |         | 25-30 | 25-40 | 30-40  | 20-35  | 15-25  |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø mm | d mm | €     | L mm  | l mm  |   |
|------|------|-------|-------|-------|---|
| 3,00 | 6,00 | 54,25 | 62,00 | 20,00 | 1 |
| 3,10 | 6,00 | 54,25 | 62,00 | 20,00 | 1 |
| 3,20 | 6,00 | 54,25 | 62,00 | 20,00 | 1 |
| 3,30 | 6,00 | 54,25 | 62,00 | 20,00 | 1 |
| 3,40 | 6,00 | 54,25 | 62,00 | 20,00 | 1 |
| 3,50 | 6,00 | 54,25 | 62,00 | 20,00 | 1 |
| 3,60 | 6,00 | 54,25 | 62,00 | 20,00 | 1 |
| 3,70 | 6,00 | 54,25 | 62,00 | 20,00 | 1 |
| 3,80 | 6,00 | 54,25 | 66,00 | 24,00 | 1 |
| 3,90 | 6,00 | 54,25 | 66,00 | 24,00 | 1 |
| 4,00 | 6,00 | 58,63 | 66,00 | 24,00 | 1 |
| 4,10 | 6,00 | 58,63 | 66,00 | 24,00 | 1 |
| 4,20 | 6,00 | 58,63 | 66,00 | 24,00 | 1 |
| 4,30 | 6,00 | 58,63 | 66,00 | 24,00 | 1 |
| 4,40 | 6,00 | 58,63 | 66,00 | 24,00 | 1 |
| 4,50 | 6,00 | 58,63 | 66,00 | 24,00 | 1 |
| 4,60 | 6,00 | 58,63 | 66,00 | 24,00 | 1 |
| 4,70 | 6,00 | 58,63 | 66,00 | 24,00 | 1 |
| 4,80 | 6,00 | 58,63 | 66,00 | 28,00 | 1 |
| 4,90 | 6,00 | 58,63 | 66,00 | 28,00 | 1 |
| 5,00 | 6,00 | 58,63 | 66,00 | 28,00 | 1 |
| 5,10 | 6,00 | 58,63 | 66,00 | 28,00 | 1 |
| 5,20 | 6,00 | 58,63 | 66,00 | 28,00 | 1 |
| 5,30 | 6,00 | 58,63 | 66,00 | 28,00 | 1 |
| 5,40 | 6,00 | 58,63 | 66,00 | 28,00 | 1 |
| 5,50 | 6,00 | 58,63 | 66,00 | 28,00 | 1 |
| 5,60 | 6,00 | 58,63 | 66,00 | 28,00 | 1 |
| 5,70 | 6,00 | 58,63 | 66,00 | 28,00 | 1 |
| 5,80 | 6,00 | 58,63 | 66,00 | 28,00 | 1 |
| 5,90 | 6,00 | 58,63 | 66,00 | 28,00 | 1 |
| 6,00 | 6,00 | 58,63 | 66,00 | 28,00 | 1 |
| 6,10 | 8,00 | 70,50 | 79,00 | 34,00 | 1 |
| 6,20 | 8,00 | 70,50 | 79,00 | 34,00 | 1 |
| 6,30 | 8,00 | 70,50 | 79,00 | 34,00 | 1 |
| 6,40 | 8,00 | 70,50 | 79,00 | 34,00 | 1 |
| 6,50 | 8,00 | 70,50 | 79,00 | 34,00 | 1 |
| 6,60 | 8,00 | 70,50 | 79,00 | 34,00 | 1 |
| 6,70 | 8,00 | 70,50 | 79,00 | 34,00 | 1 |
| 6,80 | 8,00 | 70,50 | 79,00 | 34,00 | 1 |
| 6,90 | 8,00 | 70,50 | 79,00 | 34,00 | 1 |
| 7,00 | 8,00 | 70,50 | 79,00 | 34,00 | 1 |
| 7,10 | 8,00 | 70,50 | 79,00 | 41,00 | 1 |
| 7,20 | 8,00 | 70,50 | 79,00 | 41,00 | 1 |
| 7,30 | 8,00 | 70,50 | 79,00 | 41,00 | 1 |
| 7,40 | 8,00 | 70,50 | 79,00 | 41,00 | 1 |
| 7,50 | 8,00 | 70,50 | 79,00 | 41,00 | 1 |
| 7,60 | 8,00 | 70,50 | 79,00 | 41,00 | 1 |
| 7,70 | 8,00 | 70,50 | 79,00 | 41,00 | 1 |
| 7,80 | 8,00 | 70,50 | 79,00 | 41,00 | 1 |
| 7,90 | 8,00 | 70,50 | 79,00 | 41,00 | 1 |

| Ø mm  | d mm  | €      | L mm   | l mm  |   |
|-------|-------|--------|--------|-------|---|
| 8,00  | 8,00  | 70,50  | 79,00  | 41,00 | 1 |
| 8,10  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 8,20  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 8,30  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 8,40  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 8,50  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 8,60  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 8,70  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 8,80  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 8,90  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 9,00  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 9,10  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 9,20  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 9,30  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 9,40  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 9,50  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 9,60  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 9,70  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 9,80  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 9,90  | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 10,00 | 10,00 | 88,44  | 89,00  | 47,00 | 1 |
| 10,10 | 12,00 | 125,00 | 102,00 | 55,00 | 1 |
| 10,20 | 12,00 | 125,00 | 102,00 | 55,00 | 1 |
| 10,30 | 12,00 | 125,00 | 102,00 | 55,00 | 1 |
| 10,40 | 12,00 | 125,00 | 102,00 | 55,00 | 1 |
| 10,50 | 12,00 | 125,00 | 102,00 | 55,00 | 1 |
| 10,60 | 12,00 | 125,00 | 102,00 | 55,00 | 1 |
| 10,70 | 12,00 | 125,00 | 102,00 | 55,00 | 1 |
| 10,80 | 12,00 | 125,00 | 102,00 | 55,00 | 1 |
| 10,90 | 12,00 | 125,00 | 102,00 | 55,00 | 1 |
| 11,00 | 12,00 | 125,00 | 102,00 | 55,00 | 1 |
| 11,50 | 12,00 | 125,00 | 102,00 | 55,00 | 1 |
| 11,80 | 12,00 | 125,00 | 102,00 | 55,00 | 1 |
| 12,00 | 12,00 | 125,00 | 102,00 | 55,00 | 1 |
| 12,50 | 14,00 | 158,56 | 107,00 | 60,00 | 1 |
| 12,80 | 14,00 | 158,56 | 107,00 | 60,00 | 1 |
| 13,00 | 14,00 | 158,56 | 107,00 | 60,00 | 1 |
| 13,50 | 14,00 | 158,56 | 107,00 | 60,00 | 1 |
| 14,00 | 14,00 | 158,56 | 107,00 | 60,00 | 1 |
| 14,50 | 16,00 | 197,19 | 115,00 | 65,00 | 1 |
| 15,00 | 16,00 | 197,19 | 115,00 | 65,00 | 1 |
| 16,00 | 16,00 | 197,19 | 115,00 | 65,00 | 1 |
| 16,50 | 18,00 | 314,56 | 123,00 | 73,00 | 1 |
| 17,00 | 18,00 | 314,56 | 123,00 | 73,00 | 1 |
| 17,50 | 18,00 | 314,56 | 123,00 | 73,00 | 1 |
| 18,00 | 18,00 | 314,56 | 123,00 | 73,00 | 1 |
| 18,50 | 20,00 | 341,56 | 131,00 | 79,00 | 1 |
| 19,00 | 20,00 | 341,56 | 131,00 | 79,00 | 1 |
| 19,50 | 20,00 | 341,56 | 131,00 | 79,00 | 1 |
| 20,00 | 20,00 | 341,56 | 131,00 | 79,00 | 1 |

1177

**HM-MD DIN 6537 L**

**5XD**



| P      |        |        |        | M     |        | K      |        |        | N  |    |       |         | S     |       | H      |        |        |
|--------|--------|--------|--------|-------|--------|--------|--------|--------|----|----|-------|---------|-------|-------|--------|--------|--------|
| <800   | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500   | <800   | <1.400 | Al | Cu | Mg/Zn | Plastic | Ni    | Ti    | 50 HRC | 55 HRC | 60 HRC |
| ●      | ●      | ●      | ●      | ●     | ○      | ●      | ●      | ●      |    |    |       |         | ●     | ●     | ●      | ●      | ○      |
| 50-120 | 40-85  | 35-55  | 30-45  | 40-85 | 30-55  | 70-150 | 80-120 | 50-70  |    |    |       |         | 25-30 | 25-40 | 30-40  | 20-35  | 15-25  |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø mm | d mm  | €     | L mm   | I mm  |   |
|------|-------|-------|--------|-------|---|
| 3,00 | 6,00  | 62,44 | 66,00  | 28,00 | 1 |
| 3,10 | 6,00  | 62,44 | 66,00  | 28,00 | 1 |
| 3,20 | 6,00  | 62,44 | 66,00  | 28,00 | 1 |
| 3,30 | 6,00  | 62,44 | 66,00  | 28,00 | 1 |
| 3,40 | 6,00  | 62,44 | 66,00  | 28,00 | 1 |
| 3,50 | 6,00  | 62,44 | 66,00  | 28,00 | 1 |
| 3,60 | 6,00  | 62,44 | 66,00  | 28,00 | 1 |
| 3,70 | 6,00  | 62,44 | 66,00  | 28,00 | 1 |
| 3,80 | 6,00  | 62,44 | 74,00  | 36,00 | 1 |
| 3,90 | 6,00  | 62,44 | 74,00  | 36,00 | 1 |
| 4,00 | 6,00  | 66,38 | 74,00  | 36,00 | 1 |
| 4,10 | 6,00  | 66,38 | 74,00  | 36,00 | 1 |
| 4,20 | 6,00  | 66,38 | 74,00  | 36,00 | 1 |
| 4,30 | 6,00  | 66,38 | 74,00  | 36,00 | 1 |
| 4,40 | 6,00  | 66,38 | 74,00  | 36,00 | 1 |
| 4,50 | 6,00  | 66,38 | 74,00  | 36,00 | 1 |
| 4,60 | 6,00  | 66,38 | 74,00  | 36,00 | 1 |
| 4,70 | 6,00  | 66,38 | 74,00  | 36,00 | 1 |
| 4,80 | 6,00  | 66,38 | 82,00  | 44,00 | 1 |
| 4,90 | 6,00  | 66,38 | 82,00  | 44,00 | 1 |
| 5,00 | 6,00  | 66,38 | 82,00  | 44,00 | 1 |
| 5,10 | 6,00  | 66,38 | 82,00  | 44,00 | 1 |
| 5,20 | 6,00  | 66,38 | 82,00  | 44,00 | 1 |
| 5,30 | 6,00  | 66,38 | 82,00  | 44,00 | 1 |
| 5,40 | 6,00  | 66,38 | 82,00  | 44,00 | 1 |
| 5,50 | 6,00  | 66,38 | 82,00  | 44,00 | 1 |
| 5,60 | 6,00  | 66,38 | 82,00  | 44,00 | 1 |
| 5,70 | 6,00  | 66,38 | 82,00  | 44,00 | 1 |
| 5,80 | 6,00  | 66,38 | 82,00  | 44,00 | 1 |
| 5,90 | 6,00  | 66,38 | 82,00  | 44,00 | 1 |
| 6,00 | 6,00  | 66,38 | 82,00  | 44,00 | 1 |
| 6,10 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 6,20 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 6,30 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 6,40 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 6,50 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 6,60 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 6,70 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 6,80 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 6,90 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 7,00 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 7,10 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 7,20 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 7,30 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 7,40 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 7,50 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 7,60 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 7,70 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 7,80 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 7,90 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 8,00 | 8,00  | 74,19 | 91,00  | 53,00 | 1 |
| 8,10 | 10,00 | 93,06 | 103,00 | 61,00 | 1 |

| Ø mm  | d mm  | €      | L mm   | I mm   |   |
|-------|-------|--------|--------|--------|---|
| 8,20  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 8,30  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 8,40  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 8,50  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 8,60  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 8,70  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 8,80  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 8,90  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 9,00  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 9,10  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 9,20  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 9,30  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 9,40  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 9,50  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 9,60  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 9,70  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 9,80  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 9,90  | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 10,00 | 10,00 | 93,06  | 103,00 | 61,00  | 1 |
| 10,10 | 12,00 | 131,81 | 118,00 | 71,00  | 1 |
| 10,20 | 12,00 | 131,81 | 118,00 | 71,00  | 1 |
| 10,30 | 12,00 | 131,81 | 118,00 | 71,00  | 1 |
| 10,40 | 12,00 | 131,81 | 118,00 | 71,00  | 1 |
| 10,50 | 12,00 | 131,81 | 118,00 | 71,00  | 1 |
| 10,60 | 12,00 | 131,81 | 118,00 | 71,00  | 1 |
| 10,70 | 12,00 | 131,81 | 118,00 | 71,00  | 1 |
| 10,80 | 12,00 | 131,81 | 118,00 | 71,00  | 1 |
| 10,90 | 12,00 | 131,81 | 118,00 | 71,00  | 1 |
| 11,00 | 12,00 | 131,81 | 118,00 | 71,00  | 1 |
| 11,50 | 12,00 | 131,81 | 118,00 | 71,00  | 1 |
| 11,80 | 12,00 | 131,81 | 118,00 | 71,00  | 1 |
| 12,00 | 12,00 | 131,81 | 118,00 | 71,00  | 1 |
| 12,50 | 14,00 | 176,13 | 124,00 | 77,00  | 1 |
| 12,80 | 14,00 | 176,13 | 124,00 | 77,00  | 1 |
| 13,00 | 14,00 | 176,13 | 124,00 | 77,00  | 1 |
| 13,50 | 14,00 | 176,13 | 124,00 | 77,00  | 1 |
| 13,80 | 14,00 | 176,13 | 124,00 | 77,00  | 1 |
| 14,00 | 14,00 | 176,13 | 124,00 | 77,00  | 1 |
| 14,50 | 16,00 | 219,06 | 133,00 | 83,00  | 1 |
| 14,80 | 16,00 | 219,06 | 133,00 | 83,00  | 1 |
| 15,00 | 16,00 | 219,06 | 133,00 | 83,00  | 1 |
| 15,80 | 16,00 | 219,06 | 133,00 | 83,00  | 1 |
| 16,00 | 16,00 | 219,06 | 133,00 | 83,00  | 1 |
| 16,50 | 18,00 | 349,31 | 143,00 | 93,00  | 1 |
| 17,00 | 18,00 | 349,31 | 143,00 | 93,00  | 1 |
| 17,50 | 18,00 | 349,31 | 143,00 | 93,00  | 1 |
| 18,00 | 18,00 | 349,31 | 143,00 | 93,00  | 1 |
| 18,50 | 20,00 | 379,88 | 153,00 | 101,00 | 1 |
| 19,00 | 20,00 | 379,88 | 153,00 | 101,00 | 1 |
| 19,50 | 20,00 | 379,88 | 153,00 | 101,00 | 1 |
| 20,00 | 20,00 | 379,88 | 153,00 | 101,00 | 1 |

**1178**

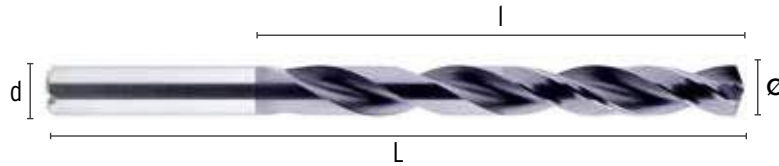
**HM-MD DIN 6537 EL**

**8XD**



| P      |        |        |        | M     |        | K      |        |        | N  |    |       |         | S     |       | H      |        |        |
|--------|--------|--------|--------|-------|--------|--------|--------|--------|----|----|-------|---------|-------|-------|--------|--------|--------|
| <800   | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500   | <800   | <1.400 | Al | Cu | Mg/Zn | Plastic | Ni    | Ti    | 50 HRC | 55 HRC | 60 HRC |
| ●      | ●      | ●      | ●      | ●     | ○      | ●      | ●      | ●      |    |    |       |         | ●     | ●     | ●      | ●      | ○      |
| 50-120 | 40-85  | 35-55  | 30-45  | 40-85 | 30-55  | 70-150 | 80-120 | 50-70  |    |    |       |         | 25-30 | 25-40 | 30-40  | 20-35  | 15-25  |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø mm | d mm | €      | L mm | I mm |   |
|------|------|--------|------|------|---|
| 3,00 | 6    | 148,38 | 70   | 30   | 1 |
| 3,30 | 6    | 148,38 | 70   | 30   | 1 |
| 3,50 | 6    | 148,38 | 70   | 30   | 1 |
| 3,70 | 6    | 148,38 | 70   | 30   | 1 |
| 4,00 | 6    | 148,38 | 75   | 37   | 1 |
| 4,20 | 6    | 148,38 | 75   | 37   | 1 |
| 4,50 | 6    | 148,38 | 75   | 37   | 1 |
| 4,70 | 6    | 148,38 | 75   | 37   | 1 |
| 5,00 | 6    | 148,38 | 90   | 50   | 1 |
| 5,50 | 6    | 148,38 | 90   | 50   | 1 |
| 6,00 | 6    | 148,38 | 90   | 50   | 1 |
| 6,50 | 8    | 172,44 | 106  | 66   | 1 |
| 6,80 | 8    | 172,44 | 106  | 66   | 1 |
| 7,00 | 8    | 172,44 | 106  | 66   | 1 |

| Ø mm  | d mm | €      | L mm | I mm |   |
|-------|------|--------|------|------|---|
| 7,50  | 8    | 172,44 | 106  | 66   | 1 |
| 8,00  | 8    | 172,44 | 106  | 66   | 1 |
| 8,50  | 10   | 207,75 | 131  | 87   | 1 |
| 9,00  | 10   | 207,75 | 131  | 87   | 1 |
| 9,50  | 10   | 207,75 | 131  | 87   | 1 |
| 10,00 | 10   | 207,75 | 131  | 87   | 1 |
| 10,20 | 12   | 283,75 | 155  | 106  | 1 |
| 10,50 | 12   | 283,75 | 155  | 106  | 1 |
| 11,00 | 12   | 283,75 | 155  | 106  | 1 |
| 12,00 | 12   | 283,75 | 155  | 106  | 1 |
| 13,00 | 14   | 403,94 | 182  | 133  | 1 |
| 14,00 | 14   | 403,94 | 182  | 133  | 1 |
| 15,00 | 16   | 503,50 | 204  | 152  | 1 |
| 16,00 | 16   | 503,50 | 204  | 152  | 1 |

**1184**

**HM-MD**

**12XD**



| P     |        |        |        | M     |        | K      |       |        | N  |    |       |         | S     |    | H      |        |        |
|-------|--------|--------|--------|-------|--------|--------|-------|--------|----|----|-------|---------|-------|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500   | <800  | <1.400 | Al | Cu | Mg/Zn | Plastic | Ni    | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      | ●      | ●     | ○      | ●      | ●     | ●      |    |    |       |         | ●     | ●  |        |        |        |
| 40-90 | 35-55  | 30-50  | 25-40  | 35-55 |        | 60-120 | 60-90 | 30-50  |    |    |       |         | 15-25 |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

**NEW**



| Ø mm | d mm | €      | L mm | I mm |   |
|------|------|--------|------|------|---|
| 3,00 | 6    | 199,31 | 90   | 50   | 1 |
| 3,30 | 6    | 199,31 | 90   | 50   | 1 |
| 3,50 | 6    | 199,31 | 90   | 50   | 1 |
| 3,70 | 6    | 199,31 | 90   | 50   | 1 |
| 4,00 | 6    | 199,31 | 102  | 64   | 1 |
| 4,20 | 6    | 199,31 | 102  | 64   | 1 |
| 4,50 | 6    | 199,31 | 102  | 64   | 1 |
| 4,70 | 6    | 199,31 | 102  | 64   | 1 |
| 5,00 | 6    | 199,31 | 116  | 78   | 1 |
| 5,50 | 6    | 199,31 | 116  | 78   | 1 |
| 6,00 | 6    | 199,31 | 116  | 78   | 1 |
| 6,50 | 8    | 245,69 | 146  | 108  | 1 |
| 6,80 | 8    | 245,69 | 146  | 108  | 1 |
| 7,00 | 8    | 245,69 | 146  | 108  | 1 |

| Ø mm  | d mm | €      | L mm | I mm |   |
|-------|------|--------|------|------|---|
| 7,50  | 8    | 245,69 | 146  | 108  | 1 |
| 8,00  | 8    | 245,69 | 146  | 108  | 1 |
| 8,50  | 10   | 309,75 | 162  | 120  | 1 |
| 9,00  | 10   | 309,75 | 162  | 120  | 1 |
| 9,50  | 10   | 309,75 | 162  | 120  | 1 |
| 10,00 | 10   | 309,75 | 162  | 120  | 1 |
| 10,20 | 12   | 411,00 | 204  | 156  | 1 |
| 10,50 | 12   | 411,00 | 204  | 156  | 1 |
| 11,00 | 12   | 411,00 | 204  | 156  | 1 |
| 12,00 | 12   | 411,00 | 204  | 156  | 1 |
| 13,00 | 14   | 509,19 | 230  | 182  | 1 |
| 14,00 | 14   | 509,19 | 230  | 182  | 1 |
| 15,00 | 16   | 720,56 | 260  | 208  | 1 |
| 16,00 | 16   | 720,56 | 260  | 208  | 1 |

**1182**

**HM-MD**

**1XD**



| P    |        |        |        | M    |        | K    |      |        | N  |    |       |         | S  |    | H      |        |        |
|------|--------|--------|--------|------|--------|------|------|--------|----|----|-------|---------|----|----|--------|--------|--------|
| <800 | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500 | <800 | <1.400 | Al | Cu | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
|      |        |        |        |      |        |      |      |        |    |    |       |         |    |    | ●      | ●      | ●      |
|      |        |        |        |      |        |      |      |        |    |    |       |         |    |    | 25-30  | 15-25  | 10-15  |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



**Sacar Machos rotos / Enlever Taraud cassés / Remove Broken Taps**

| Ø<br>mm | M  | €      | L<br>mm | l<br>mm | d<br>mm |
|---------|----|--------|---------|---------|---------|
| 2,5     | M3 | 82,38  | 38      | 10      | 3       |
| 3,3     | M4 | 113,31 | 46      | 14      | 4       |
| 4,2     | M5 | 127,53 | 50      | 19      | 5       |
| 5       | M6 | 141,62 | 50      | 23      | 6       |

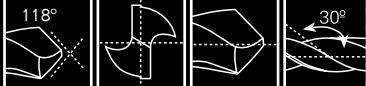
| Ø<br>mm | M   | €      | L<br>mm | l<br>mm | d<br>mm |
|---------|-----|--------|---------|---------|---------|
| 6,8     | M8  | 155,84 | 60      | 23      | 8       |
| 8,5     | M10 | 198,28 | 80      | 25      | 10      |
| 10,2    | M12 | 295,36 | 80      | 35      | 12      |



**1120**

**HM-MD DIN 6539 N**

**2XD**



| P     |        |        |        | M     |        | K     |       |        | N      |       |       |         | S     |       | H      |        |        |
|-------|--------|--------|--------|-------|--------|-------|-------|--------|--------|-------|-------|---------|-------|-------|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500  | <800  | <1.400 | Al     | Cu    | Mg/Zn | Plastic | Ni    | Ti    | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      | ●      | ●     | ●      | ●     | ●     | ●      | ●      | ●     | ●     | ●       | ○     | ○     |        |        |        |
| 30-70 | 25-50  | 20-40  | 15-25  | 20-25 |        | 50-70 | 40-50 |        | 60-140 | 25-70 | 30-60 | 40-70   | 10-15 | 10-25 |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 2,00    | 6,88  | 38      | 12      | 1 |
| 2,10    | 7,50  | 38      | 12      | 1 |
| 2,20    | 7,50  | 40      | 13      | 1 |
| 2,30    | 7,50  | 40      | 13      | 1 |
| 2,40    | 7,50  | 43      | 14      | 1 |
| 2,50    | 7,50  | 43      | 14      | 1 |
| 2,60    | 7,50  | 43      | 14      | 1 |
| 2,70    | 10,07 | 46      | 16      | 1 |
| 2,80    | 10,26 | 46      | 16      | 1 |
| 2,90    | 10,26 | 46      | 16      | 1 |
| 3,00    | 10,07 | 46      | 16      | 1 |
| 3,10    | 10,26 | 49      | 18      | 1 |
| 3,20    | 10,26 | 49      | 18      | 1 |
| 3,30    | 10,26 | 49      | 18      | 1 |
| 3,40    | 11,46 | 52      | 20      | 1 |
| 3,50    | 11,46 | 52      | 20      | 1 |
| 3,60    | 12,65 | 52      | 20      | 1 |
| 3,70    | 12,65 | 52      | 20      | 1 |
| 3,80    | 13,18 | 52      | 20      | 1 |
| 3,90    | 13,18 | 55      | 22      | 1 |
| 4,00    | 13,18 | 55      | 22      | 1 |
| 4,10    | 14,36 | 55      | 22      | 1 |
| 4,20    | 14,36 | 55      | 22      | 1 |
| 4,30    | 15,08 | 58      | 24      | 1 |
| 4,40    | 15,08 | 58      | 24      | 1 |
| 4,50    | 15,08 | 58      | 24      | 1 |
| 4,60    | 15,08 | 58      | 24      | 1 |
| 4,70    | 16,03 | 58      | 24      | 1 |
| 4,80    | 16,03 | 62      | 26      | 1 |
| 4,90    | 16,03 | 62      | 26      | 1 |
| 5,00    | 16,03 | 62      | 26      | 1 |
| 5,10    | 21,28 | 62      | 26      | 1 |
| 5,20    | 21,28 | 62      | 26      | 1 |
| 5,30    | 23,25 | 62      | 26      | 1 |
| 5,40    | 23,25 | 66      | 28      | 1 |
| 5,50    | 21,28 | 66      | 28      | 1 |
| 5,60    | 24,58 | 66      | 28      | 1 |
| 5,70    | 24,58 | 66      | 28      | 1 |
| 5,80    | 22,33 | 66      | 28      | 1 |
| 5,90    | 24,58 | 66      | 28      | 1 |
| 6,00    | 22,33 | 66      | 28      | 1 |
| 6,10    | 27,45 | 70      | 31      | 1 |
| 6,20    | 27,45 | 70      | 31      | 1 |
| 6,30    | 27,45 | 70      | 31      | 1 |

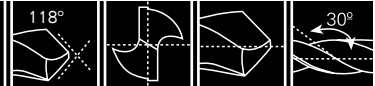
| Ø<br>mm | €      | L<br>mm | l<br>mm |   |
|---------|--------|---------|---------|---|
| 6,40    | 27,45  | 70      | 31      | 1 |
| 6,50    | 27,45  | 70      | 31      | 1 |
| 6,60    | 33,22  | 70      | 31      | 1 |
| 6,70    | 33,22  | 70      | 31      | 1 |
| 6,80    | 33,22  | 74      | 34      | 1 |
| 6,90    | 33,22  | 74      | 34      | 1 |
| 7,00    | 32,08  | 74      | 34      | 1 |
| 7,10    | 39,04  | 74      | 34      | 1 |
| 7,20    | 39,04  | 74      | 34      | 1 |
| 7,30    | 39,04  | 74      | 34      | 1 |
| 7,40    | 39,04  | 74      | 34      | 1 |
| 7,50    | 39,04  | 74      | 34      | 1 |
| 7,60    | 47,83  | 79      | 37      | 1 |
| 7,70    | 47,83  | 79      | 37      | 1 |
| 7,80    | 47,83  | 79      | 37      | 1 |
| 7,90    | 47,83  | 79      | 37      | 1 |
| 8,00    | 43,48  | 79      | 37      | 1 |
| 8,10    | 54,98  | 79      | 37      | 1 |
| 8,20    | 54,98  | 79      | 37      | 1 |
| 8,30    | 54,98  | 79      | 37      | 1 |
| 8,40    | 54,98  | 79      | 37      | 1 |
| 8,50    | 54,98  | 79      | 37      | 1 |
| 8,60    | 58,37  | 84      | 40      | 1 |
| 8,70    | 58,37  | 84      | 40      | 1 |
| 8,80    | 58,37  | 84      | 40      | 1 |
| 8,90    | 58,37  | 84      | 40      | 1 |
| 9,00    | 56,23  | 84      | 40      | 1 |
| 9,10    | 56,23  | 84      | 40      | 1 |
| 9,20    | 57,90  | 84      | 40      | 1 |
| 9,30    | 57,90  | 84      | 40      | 1 |
| 9,40    | 57,90  | 84      | 40      | 1 |
| 9,50    | 61,90  | 84      | 40      | 1 |
| 9,60    | 61,90  | 89      | 43      | 1 |
| 9,70    | 61,90  | 89      | 43      | 1 |
| 9,80    | 61,90  | 89      | 43      | 1 |
| 9,90    | 61,90  | 89      | 43      | 1 |
| 10,00   | 78,08  | 89      | 43      | 1 |
| 10,20   | 79,61  | 89      | 43      | 1 |
| 10,50   | 94,07  | 89      | 43      | 1 |
| 11,00   | 100,65 | 95      | 47      | 1 |
| 11,50   | 107,25 | 95      | 47      | 1 |
| 12,00   | 107,25 | 102     | 51      | 1 |
| 13,00   | 160,70 | 102     | 51      | 1 |



**1109**

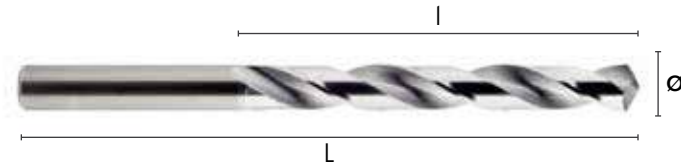
**HM-MD DIN 338 N**

**4XD**



| P     |        |        |        | M     |        | K     |       |        | N      |       |       |         | S     |       | H      |        |        |
|-------|--------|--------|--------|-------|--------|-------|-------|--------|--------|-------|-------|---------|-------|-------|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500  | <800  | <1.400 | Al     | Cu    | Mg/Zn | Plastic | Ni    | Ti    | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      | ●      | ●     | ●      | ●     | ●     | ●      | ●      | ●     | ●     | ●       | ○     | ○     |        |        |        |
| 30-70 | 25-50  | 20-40  | 15-25  | 20-25 |        | 50-70 | 40-50 |        | 60-140 | 25-70 | 30-60 | 40-70   | 10-15 | 10-25 |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 2,00    | 9,26  | 49      | 24      | 1 |
| 2,10    | 10,93 | 49      | 24      | 1 |
| 2,20    | 11,50 | 53      | 27      | 1 |
| 2,30    | 11,50 | 53      | 27      | 1 |
| 2,40    | 11,50 | 57      | 30      | 1 |
| 2,50    | 11,50 | 57      | 30      | 1 |
| 2,60    | 13,65 | 57      | 30      | 1 |
| 2,70    | 14,03 | 61      | 33      | 1 |
| 2,80    | 14,03 | 61      | 33      | 1 |
| 2,90    | 14,03 | 61      | 33      | 1 |
| 3,00    | 14,03 | 61      | 33      | 1 |
| 3,10    | 14,32 | 65      | 36      | 1 |
| 3,20    | 14,89 | 65      | 36      | 1 |
| 3,30    | 14,98 | 65      | 36      | 1 |
| 3,40    | 16,71 | 70      | 39      | 1 |
| 3,50    | 16,13 | 70      | 39      | 1 |
| 3,60    | 17,33 | 70      | 39      | 1 |
| 3,70    | 17,33 | 70      | 39      | 1 |
| 3,80    | 17,51 | 75      | 43      | 1 |
| 3,90    | 18,19 | 75      | 43      | 1 |
| 4,00    | 18,38 | 75      | 43      | 1 |
| 4,10    | 23,10 | 75      | 43      | 1 |
| 4,20    | 23,10 | 75      | 43      | 1 |
| 4,30    | 23,10 | 80      | 47      | 1 |
| 4,40    | 23,10 | 80      | 47      | 1 |
| 4,50    | 23,05 | 80      | 47      | 1 |

| Ø<br>mm | €      | L<br>mm | l<br>mm |   |
|---------|--------|---------|---------|---|
| 4,60    | 27,11  | 80      | 47      | 1 |
| 4,70    | 27,11  | 80      | 47      | 1 |
| 4,80    | 27,11  | 86      | 52      | 1 |
| 4,90    | 27,11  | 86      | 52      | 1 |
| 5,00    | 27,11  | 86      | 52      | 1 |
| 5,10    | 33,26  | 86      | 52      | 1 |
| 5,20    | 33,26  | 86      | 52      | 1 |
| 5,30    | 33,26  | 86      | 52      | 1 |
| 5,40    | 33,26  | 93      | 57      | 1 |
| 5,50    | 33,26  | 93      | 57      | 1 |
| 5,60    | 35,75  | 93      | 57      | 1 |
| 5,70    | 35,75  | 93      | 57      | 1 |
| 5,80    | 35,75  | 93      | 57      | 1 |
| 5,90    | 35,75  | 93      | 57      | 1 |
| 6,00    | 35,75  | 93      | 57      | 1 |
| 6,10    | 45,00  | 101     | 63      | 1 |
| 6,20    | 45,00  | 101     | 63      | 1 |
| 6,30    | 45,00  | 101     | 63      | 1 |
| 6,40    | 45,00  | 101     | 63      | 1 |
| 6,50    | 45,00  | 101     | 63      | 1 |
| 6,80    | 55,99  | 109     | 69      | 1 |
| 7,00    | 55,99  | 109     | 69      | 1 |
| 8,00    | 77,23  | 117     | 75      | 1 |
| 8,50    | 88,63  | 117     | 75      | 1 |
| 10,00   | 143,27 | 113     | 87      | 1 |
| 10,20   | 143,27 | 113     | 87      | 1 |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1101

HSS DIN 338 N



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     |        |        |        |      |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 |        |        |        |      |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €    | L<br>mm | l<br>mm |    |
|---------|------|---------|---------|----|
| 0,20    | 2,54 | 19      | 2,50    | 10 |
| 0,25    | 2,54 | 19      | 3       | 10 |
| 0,30    | 2,54 | 19      | 3       | 10 |
| 0,35    | 2,54 | 19      | 3       | 10 |
| 0,40    | 2,54 | 20      | 5       | 10 |
| 0,45    | 2,54 | 22      | 6       | 10 |
| 0,50    | 1,88 | 22      | 6       | 10 |
| 0,55    | 1,91 | 24      | 7       | 10 |
| 0,60    | 1,91 | 24      | 7       | 10 |
| 0,65    | 1,91 | 26      | 8       | 10 |
| 0,70    | 1,91 | 28      | 9       | 10 |
| 0,75    | 1,80 | 28      | 9       | 10 |
| 0,80    | 1,80 | 30      | 10      | 10 |
| 0,85    | 1,80 | 30      | 10      | 10 |
| 0,90    | 1,80 | 32      | 11      | 10 |
| 0,95    | 1,80 | 32      | 11      | 10 |
| 1,00    | 1,08 | 34      | 12      | 10 |
| 1,05    | 1,35 | 34      | 12      | 10 |
| 1,10    | 1,23 | 36      | 14      | 10 |
| 1,15    | 1,23 | 36      | 14      | 10 |
| 1,20    | 1,23 | 38      | 16      | 10 |
| 1,25    | 1,00 | 38      | 16      | 10 |
| 1,30    | 1,12 | 38      | 16      | 10 |
| 1,35    | 1,23 | 40      | 18      | 10 |
| 1,40    | 1,12 | 40      | 18      | 10 |
| 1,45    | 1,17 | 40      | 18      | 10 |
| 1,50    | 0,91 | 40      | 18      | 10 |
| 1,55    | 1,17 | 43      | 20      | 10 |
| 1,60    | 1,08 | 43      | 20      | 10 |
| 1,65    | 1,17 | 43      | 20      | 10 |
| 1,70    | 1,08 | 43      | 20      | 10 |
| 1,75    | 1,00 | 46      | 22      | 10 |
| 1,80    | 1,08 | 46      | 22      | 10 |
| 1,85    | 1,08 | 46      | 22      | 10 |
| 1,90    | 1,08 | 46      | 22      | 10 |
| 1,95    | 1,17 | 49      | 24      | 10 |
| 2,00    | 0,89 | 49      | 24      | 10 |
| 2,05    | 1,17 | 49      | 24      | 10 |
| 2,10    | 1,08 | 49      | 24      | 10 |
| 2,15    | 1,17 | 53      | 27      | 10 |
| 2,20    | 1,08 | 53      | 27      | 10 |
| 2,25    | 0,98 | 53      | 27      | 10 |
| 2,30    | 1,08 | 53      | 27      | 10 |
| 2,35    | 1,08 | 53      | 27      | 10 |
| 2,40    | 1,08 | 57      | 30      | 10 |
| 2,45    | 1,17 | 57      | 30      | 10 |
| 2,50    | 0,89 | 57      | 30      | 10 |
| 2,55    | 1,23 | 57      | 30      | 10 |
| 2,60    | 1,12 | 57      | 30      | 10 |
| 2,65    | 1,12 | 57      | 30      | 10 |

| Ø<br>mm | €    | L<br>mm | l<br>mm |    |
|---------|------|---------|---------|----|
| 2,70    | 1,12 | 61      | 33      | 10 |
| 2,75    | 1,00 | 61      | 33      | 10 |
| 2,80    | 1,12 | 61      | 33      | 10 |
| 2,85    | 1,23 | 61      | 33      | 10 |
| 2,90    | 1,12 | 61      | 33      | 10 |
| 2,95    | 1,23 | 61      | 33      | 10 |
| 3,00    | 0,78 | 61      | 33      | 10 |
| 3,05    | 1,30 | 65      | 36      | 10 |
| 3,10    | 1,11 | 65      | 36      | 10 |
| 3,15    | 1,30 | 65      | 36      | 10 |
| 3,20    | 1,11 | 65      | 36      | 10 |
| 3,25    | 0,98 | 65      | 36      | 10 |
| 3,30    | 1,18 | 65      | 36      | 10 |
| 3,35    | 1,30 | 70      | 39      | 10 |
| 3,40    | 1,18 | 70      | 39      | 10 |
| 3,45    | 1,30 | 70      | 39      | 10 |
| 3,50    | 0,98 | 70      | 39      | 10 |
| 3,55    | 1,45 | 70      | 39      | 10 |
| 3,60    | 1,30 | 70      | 39      | 10 |
| 3,65    | 1,45 | 70      | 39      | 10 |
| 3,70    | 1,30 | 70      | 39      | 10 |
| 3,75    | 1,19 | 70      | 39      | 10 |
| 3,80    | 1,30 | 75      | 43      | 10 |
| 3,90    | 1,30 | 75      | 43      | 10 |
| 3,95    | 1,44 | 75      | 43      | 10 |
| 4,00    | 1,01 | 75      | 43      | 10 |
| 4,05    | 1,55 | 75      | 43      | 10 |
| 4,10    | 1,41 | 75      | 43      | 10 |
| 4,15    | 1,55 | 75      | 43      | 10 |
| 4,20    | 1,41 | 75      | 43      | 10 |
| 4,25    | 1,30 | 75      | 43      | 10 |
| 4,30    | 1,54 | 80      | 47      | 10 |
| 4,40    | 1,54 | 80      | 47      | 10 |
| 4,50    | 1,30 | 80      | 47      | 10 |
| 4,55    | 1,91 | 80      | 47      | 10 |
| 4,60    | 1,74 | 80      | 47      | 10 |
| 4,65    | 1,91 | 80      | 47      | 10 |
| 4,70    | 1,74 | 80      | 47      | 10 |
| 4,75    | 1,60 | 80      | 47      | 10 |
| 4,80    | 1,74 | 86      | 52      | 10 |
| 4,90    | 1,74 | 86      | 52      | 10 |
| 5,00    | 1,28 | 86      | 52      | 10 |
| 5,10    | 1,93 | 86      | 52      | 10 |
| 5,20    | 2,13 | 86      | 52      | 10 |
| 5,25    | 1,63 | 86      | 52      | 10 |
| 5,30    | 1,93 | 86      | 52      | 10 |
| 5,40    | 1,93 | 93      | 57      | 10 |
| 5,50    | 1,63 | 93      | 57      | 10 |
| 5,60    | 2,23 | 93      | 57      | 10 |
| 5,70    | 2,23 | 93      | 57      | 10 |

**P**

Aceros  
Aciers  
Steels

**M**

Aceros Inox  
Aciers Inox  
Stainless Steels

**K**

Fundición  
Fonte  
Cast Iron

**N**

Metales no ferrosos  
Métal non Ferreux  
Non Ferrous metals

**S**

Titanio y Superalloys  
Titanium et Superalloys  
Titanium and Superalloys

**H**

Materiales Duros  
Matériaux Durs  
Hard materials

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

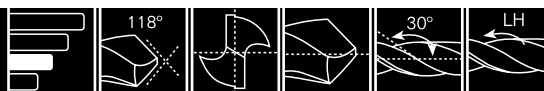
(continúa Ref.11010 / suite Réf.11010 / Ref.11010 cont'd)

| Ø<br>mm | €    | L<br>mm | l<br>mm |  |
|---------|------|---------|---------|-----------------------------------------------------------------------------------|
| 5,75    | 2,03 | 93      | 57      | 10                                                                                |
| 5,80    | 2,23 | 93      | 57      | 10                                                                                |
| 5,85    | 2,44 | 93      | 57      | 10                                                                                |
| 5,90    | 2,23 | 93      | 57      | 10                                                                                |
| 6,00    | 1,72 | 93      | 57      | 10                                                                                |
| 6,10    | 2,61 | 101     | 63      | 10                                                                                |
| 6,20    | 2,61 | 101     | 63      | 10                                                                                |
| 6,25    | 2,40 | 101     | 63      | 10                                                                                |
| 6,30    | 2,61 | 101     | 63      | 10                                                                                |
| 6,35    | 2,88 | 101     | 63      | 10                                                                                |
| 6,40    | 2,61 | 101     | 63      | 10                                                                                |
| 6,50    | 2,21 | 101     | 63      | 10                                                                                |
| 6,60    | 3,02 | 101     | 63      | 10                                                                                |
| 6,70    | 3,02 | 101     | 63      | 10                                                                                |
| 6,75    | 2,77 | 109     | 69      | 10                                                                                |
| 6,80    | 3,02 | 109     | 69      | 10                                                                                |
| 6,90    | 3,02 | 109     | 69      | 10                                                                                |
| 6,95    | 3,34 | 109     | 69      | 10                                                                                |
| 7,00    | 2,54 | 109     | 69      | 10                                                                                |
| 7,10    | 3,43 | 109     | 69      | 10                                                                                |
| 7,20    | 3,43 | 109     | 69      | 10                                                                                |
| 7,25    | 3,16 | 109     | 69      | 10                                                                                |
| 7,30    | 3,43 | 109     | 69      | 10                                                                                |
| 7,35    | 3,76 | 109     | 69      | 10                                                                                |
| 7,40    | 3,43 | 109     | 69      | 10                                                                                |
| 7,50    | 2,86 | 109     | 69      | 10                                                                                |
| 7,60    | 3,75 | 117     | 75      | 10                                                                                |
| 7,65    | 4,13 | 117     | 75      | 10                                                                                |
| 7,70    | 3,75 | 117     | 75      | 10                                                                                |
| 7,75    | 3,44 | 117     | 75      | 10                                                                                |
| 7,80    | 3,75 | 117     | 75      | 10                                                                                |
| 7,90    | 3,75 | 117     | 75      | 10                                                                                |
| 7,95    | 4,13 | 117     | 75      | 10                                                                                |
| 8,00    | 2,99 | 117     | 75      | 10                                                                                |
| 8,10    | 4,47 | 117     | 75      | 10                                                                                |
| 8,15    | 4,92 | 117     | 75      | 10                                                                                |
| 8,20    | 4,47 | 117     | 75      | 10                                                                                |
| 8,25    | 4,12 | 117     | 75      | 10                                                                                |
| 8,30    | 4,47 | 117     | 75      | 10                                                                                |
| 8,40    | 4,47 | 117     | 75      | 10                                                                                |
| 8,45    | 4,92 | 117     | 75      | 10                                                                                |
| 8,50    | 3,75 | 117     | 75      | 10                                                                                |
| 8,60    | 4,89 | 125     | 81      | 10                                                                                |
| 8,65    | 5,38 | 125     | 81      | 10                                                                                |
| 8,70    | 4,89 | 125     | 81      | 10                                                                                |
| 8,75    | 4,47 | 125     | 81      | 10                                                                                |
| 8,80    | 4,89 | 125     | 81      | 10                                                                                |
| 8,90    | 5,38 | 125     | 81      | 10                                                                                |
| 8,95    | 5,38 | 125     | 81      | 10                                                                                |
| 9,00    | 4,11 | 125     | 81      | 10                                                                                |
| 9,05    | 5,82 | 125     | 81      | 10                                                                                |
| 9,10    | 5,49 | 125     | 81      | 10                                                                                |
| 9,20    | 5,49 | 125     | 81      | 10                                                                                |
| 9,25    | 5,49 | 125     | 81      | 10                                                                                |
| 9,30    | 5,49 | 125     | 81      | 10                                                                                |
| 9,35    | 6,07 | 125     | 81      | 10                                                                                |
| 9,40    | 5,49 | 125     | 81      | 10                                                                                |
| 9,45    | 6,07 | 125     | 81      | 10                                                                                |
| 9,50    | 4,61 | 125     | 81      | 10                                                                                |
| 9,60    | 6,15 | 133     | 87      | 10                                                                                |
| 9,70    | 6,15 | 133     | 87      | 10                                                                                |
| 9,75    | 5,63 | 133     | 87      | 10                                                                                |
| 9,80    | 6,15 | 133     | 87      | 10                                                                                |
| 9,90    | 6,15 | 133     | 87      | 10                                                                                |
| 10,00   | 4,69 | 133     | 87      | 5                                                                                 |

| Ø<br>mm | €     | L<br>mm | l<br>mm |  |
|---------|-------|---------|---------|-------------------------------------------------------------------------------------|
| 10,10   | 6,92  | 133     | 87      | 5                                                                                   |
| 10,20   | 6,92  | 133     | 87      | 5                                                                                   |
| 10,25   | 6,37  | 133     | 87      | 5                                                                                   |
| 10,30   | 6,92  | 133     | 87      | 5                                                                                   |
| 10,40   | 6,92  | 133     | 87      | 5                                                                                   |
| 10,50   | 5,79  | 133     | 87      | 5                                                                                   |
| 10,60   | 7,73  | 133     | 87      | 5                                                                                   |
| 10,70   | 7,73  | 142     | 94      | 5                                                                                   |
| 10,75   | 7,09  | 142     | 94      | 5                                                                                   |
| 10,80   | 7,73  | 142     | 94      | 5                                                                                   |
| 10,90   | 7,73  | 142     | 94      | 5                                                                                   |
| 11,00   | 6,43  | 142     | 94      | 5                                                                                   |
| 11,10   | 8,59  | 142     | 94      | 5                                                                                   |
| 11,20   | 8,59  | 142     | 94      | 5                                                                                   |
| 11,25   | 7,89  | 142     | 94      | 5                                                                                   |
| 11,30   | 8,59  | 142     | 94      | 5                                                                                   |
| 11,40   | 8,59  | 142     | 94      | 5                                                                                   |
| 11,50   | 7,13  | 142     | 94      | 5                                                                                   |
| 11,60   | 9,04  | 142     | 94      | 5                                                                                   |
| 11,70   | 9,04  | 142     | 94      | 5                                                                                   |
| 11,75   | 8,30  | 142     | 94      | 5                                                                                   |
| 11,80   | 9,04  | 142     | 94      | 5                                                                                   |
| 11,90   | 9,04  | 151     | 101     | 5                                                                                   |
| 12,00   | 7,56  | 151     | 101     | 5                                                                                   |
| 12,10   | 10,19 | 151     | 101     | 5                                                                                   |
| 12,20   | 10,19 | 151     | 101     | 5                                                                                   |
| 12,25   | 9,32  | 151     | 101     | 5                                                                                   |
| 12,30   | 10,19 | 151     | 101     | 5                                                                                   |
| 12,40   | 10,19 | 151     | 101     | 5                                                                                   |
| 12,50   | 8,46  | 151     | 101     | 5                                                                                   |
| 12,60   | 11,12 | 151     | 101     | 5                                                                                   |
| 12,70   | 11,12 | 151     | 101     | 5                                                                                   |
| 12,75   | 10,19 | 151     | 101     | 5                                                                                   |
| 12,80   | 11,12 | 151     | 101     | 5                                                                                   |
| 12,90   | 11,12 | 151     | 101     | 5                                                                                   |
| 13,00   | 9,30  | 151     | 101     | 5                                                                                   |
| 13,25   | 12,97 | 160     | 108     | 4                                                                                   |
| 13,50   | 11,80 | 160     | 108     | 4                                                                                   |
| 13,75   | 14,04 | 160     | 108     | 4                                                                                   |
| 14,00   | 12,76 | 160     | 108     | 4                                                                                   |
| 14,25   | 16,00 | 169     | 114     | 4                                                                                   |
| 14,50   | 14,55 | 169     | 114     | 4                                                                                   |
| 14,75   | 18,30 | 169     | 114     | 4                                                                                   |
| 15,00   | 16,63 | 169     | 114     | 4                                                                                   |
| 15,25   | 22,06 | 178     | 120     | 1                                                                                   |
| 15,50   | 20,07 | 178     | 120     | 1                                                                                   |
| 15,75   | 22,06 | 178     | 120     | 1                                                                                   |
| 16,00   | 20,07 | 178     | 120     | 1                                                                                   |
| 16,25   | 28,53 | 184     | 125     | 1                                                                                   |
| 16,50   | 25,91 | 184     | 125     | 1                                                                                   |
| 16,75   | 28,53 | 184     | 125     | 1                                                                                   |
| 17,00   | 25,91 | 184     | 125     | 1                                                                                   |
| 17,25   | 31,74 | 191     | 130     | 1                                                                                   |
| 17,50   | 28,86 | 191     | 130     | 1                                                                                   |
| 17,75   | 31,74 | 191     | 130     | 1                                                                                   |
| 18,00   | 28,86 | 191     | 130     | 1                                                                                   |
| 18,25   | 35,42 | 198     | 135     | 1                                                                                   |
| 18,50   | 32,20 | 198     | 135     | 1                                                                                   |
| 18,75   | 35,42 | 198     | 135     | 1                                                                                   |
| 19,00   | 32,20 | 198     | 135     | 1                                                                                   |
| 19,25   | 42,46 | 205     | 140     | 1                                                                                   |
| 19,50   | 38,61 | 205     | 140     | 1                                                                                   |
| 19,75   | 42,45 | 205     | 140     | 1                                                                                   |
| 20,00   | 38,61 | 205     | 140     | 1                                                                                   |

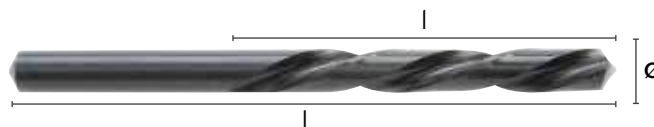
# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

## 1101/1 HSS DIN 338 N Izquierda / A gauche / Left hand



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     |        |        |        |      |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 |        |        |        |      |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø mm | €    | L mm | I mm |    |
|------|------|------|------|----|
| 2,00 | 4,31 | 49   | 24   | 10 |
| 2,25 | 4,76 | 53   | 27   | 10 |
| 2,50 | 4,31 | 57   | 30   | 10 |
| 2,75 | 4,92 | 61   | 33   | 10 |
| 3,00 | 3,84 | 61   | 33   | 10 |
| 3,25 | 4,80 | 65   | 36   | 10 |
| 3,50 | 4,80 | 70   | 39   | 10 |
| 3,75 | 5,92 | 70   | 39   | 10 |
| 4,00 | 4,95 | 75   | 43   | 10 |
| 4,50 | 6,30 | 80   | 47   | 10 |
| 5,00 | 6,26 | 86   | 52   | 10 |
| 5,25 | 7,97 | 86   | 52   | 10 |
| 5,50 | 7,97 | 93   | 57   | 10 |

| Ø mm  | €     | L mm | I mm |    |
|-------|-------|------|------|----|
| 6,00  | 8,45  | 93   | 57   | 10 |
| 6,50  | 10,73 | 101  | 63   | 10 |
| 7,00  | 12,41 | 109  | 69   | 10 |
| 7,50  | 14,12 | 109  | 69   | 10 |
| 8,00  | 14,65 | 117  | 75   | 10 |
| 8,50  | 18,45 | 117  | 75   | 10 |
| 9,00  | 20,06 | 125  | 81   | 10 |
| 9,50  | 22,51 | 125  | 81   | 10 |
| 10,00 | 23,01 | 133  | 87   | 5  |
| 10,50 | 28,91 | 133  | 87   | 5  |
| 11,00 | 32,16 | 142  | 94   | 5  |
| 11,50 | 35,65 | 142  | 94   | 5  |
| 12,00 | 37,08 | 151  | 101  | 5  |

## 1104 HSS DIN 338 N MR



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ti | Ni | 50 HRC | 55 HRC | 60 HRC |
| ●     |        |        |        |      |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 |        |        |        |      |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø mm  | d mm | €     | L mm | I mm |   |
|-------|------|-------|------|------|---|
| 10,00 | 8    | 7,99  | 133  | 87   | 1 |
| 10,50 | 8    | 9,18  | 133  | 87   | 1 |
| 11,00 | 8    | 9,18  | 142  | 94   | 1 |
| 11,50 | 8    | 10,26 | 142  | 94   | 1 |
| 12,00 | 8    | 10,26 | 151  | 101  | 1 |
| 12,50 | 8    | 11,32 | 151  | 101  | 1 |
| 13,00 | 10   | 12,48 | 151  | 101  | 1 |
| 13,25 | 10   | 15,91 | 160  | 108  | 1 |
| 13,50 | 10   | 15,91 | 160  | 108  | 1 |
| 13,75 | 10   | 17,29 | 160  | 108  | 1 |
| 14,00 | 10   | 15,91 | 160  | 108  | 1 |
| 14,25 | 10   | 19,94 | 169  | 114  | 1 |
| 14,40 | 10   | 19,65 | 169  | 114  | 1 |
| 14,50 | 10   | 19,58 | 169  | 114  | 1 |
| 14,75 | 10   | 28,07 | 169  | 114  | 1 |
| 15,00 | 10   | 19,58 | 169  | 114  | 1 |
| 15,25 | 10   | 25,95 | 178  | 120  | 1 |
| 15,50 | 10   | 23,18 | 178  | 120  | 1 |

| Ø mm  | d mm | €     | L mm | I mm |   |
|-------|------|-------|------|------|---|
| 15,75 | 10   | 25,49 | 178  | 120  | 1 |
| 16,00 | 12   | 23,18 | 178  | 120  | 1 |
| 16,25 | 12   | 33,00 | 184  | 125  | 1 |
| 16,40 | 12   | 29,88 | 184  | 125  | 1 |
| 16,50 | 12   | 29,06 | 184  | 125  | 1 |
| 16,75 | 12   | 32,00 | 184  | 125  | 1 |
| 17,00 | 12   | 29,06 | 184  | 125  | 1 |
| 17,25 | 12   | 35,60 | 191  | 130  | 1 |
| 17,50 | 12   | 32,15 | 191  | 130  | 1 |
| 17,75 | 12   | 35,35 | 191  | 130  | 1 |
| 18,00 | 12   | 32,15 | 191  | 130  | 1 |
| 18,25 | 12   | 39,44 | 198  | 135  | 1 |
| 18,50 | 12   | 36,10 | 198  | 135  | 1 |
| 18,60 | 12   | 39,14 | 198  | 135  | 1 |
| 18,75 | 12   | 39,68 | 198  | 135  | 1 |
| 19,00 | 12   | 36,10 | 198  | 135  | 1 |
| 19,25 | 12   | 47,59 | 205  | 140  | 1 |
| 19,50 | 12   | 42,58 | 205  | 140  | 1 |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

| Ø<br>mm | d<br>mm | €     | L<br>mm | l<br>mm |  |
|---------|---------|-------|---------|---------|-----------------------------------------------------------------------------------|
| 19,75   | 12      | 46,80 | 205     | 149     | 1                                                                                 |
| 20,00   | 13      | 42,58 | 205     | 140     | 1                                                                                 |
| 20,50   | 13      | 49,56 | 212     | 145     | 1                                                                                 |
| 20,60   | 13      | 40,80 | 212     | 145     | 1                                                                                 |
| 21,00   | 13      | 49,56 | 212     | 145     | 1                                                                                 |
| 21,50   | 13      | 53,99 | 219     | 150     | 1                                                                                 |
| 22,00   | 13      | 53,99 | 219     | 150     | 1                                                                                 |
| 22,50   | 13      | 57,09 | 226     | 155     | 1                                                                                 |
| 22,60   | 13      | 51,64 | 226     | 155     | 1                                                                                 |
| 23,00   | 13      | 57,09 | 226     | 155     | 1                                                                                 |
| 23,50   | 13      | 63,56 | 226     | 155     | 1                                                                                 |
| 24,00   | 13      | 63,56 | 233     | 160     | 1                                                                                 |

| Ø<br>mm | d<br>mm | €      | L<br>mm | l<br>mm |  |
|---------|---------|--------|---------|---------|-------------------------------------------------------------------------------------|
| 24,50   | 13      | 64,45  | 233     | 160     | 1                                                                                   |
| 25,00   | 13      | 64,45  | 233     | 160     | 1                                                                                   |
| 25,50   | 13      | 83,69  | 240     | 165     | 1                                                                                   |
| 26,00   | 13      | 83,69  | 240     | 165     | 1                                                                                   |
| 26,50   | 13      | 90,35  | 240     | 165     | 1                                                                                   |
| 27,00   | 13      | 90,35  | 247     | 170     | 1                                                                                   |
| 27,50   | 13      | 91,71  | 247     | 170     | 1                                                                                   |
| 28,00   | 13      | 91,71  | 247     | 170     | 1                                                                                   |
| 28,50   | 13      | 113,99 | 254     | 175     | 1                                                                                   |
| 29,00   | 13      | 113,99 | 254     | 175     | 1                                                                                   |
| 29,50   | 13      | 118,94 | 254     | 175     | 1                                                                                   |
| 30,00   | 13      | 118,94 | 254     | 175     | 1                                                                                   |

1104/9

HSS ANSI



| P       |        |        |        | M    |        | K       |         |        | N       |         |       |         | S  |    | H      |        |        |
|---------|--------|--------|--------|------|--------|---------|---------|--------|---------|---------|-------|---------|----|----|--------|--------|--------|
| <800    | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500    | <800    | <1.400 | Al      | Cu      | Mg/Zn | Plastic | Ti | Ni | 50 HRC | 55 HRC | 60 HRC |
| ● 15-35 |        |        |        |      |        | ● 25-30 | ● 12-16 |        | ○ 50-60 | ● 30-60 |       | ○ 20-25 |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | d<br>mm | €     | L<br>mm | l<br>mm |  |
|---------|---------|-------|---------|---------|-------------------------------------------------------------------------------------|
| 17/32"  | 1/2"    | 15,91 | 152     | 76      | 1                                                                                   |
| 9/16"   | 1/2"    | 15,91 | 152     | 76      | 1                                                                                   |
| 19/32"  | 1/2"    | 19,58 | 152     | 76      | 1                                                                                   |
| 5/8"    | 1/2"    | 23,18 | 152     | 76      | 1                                                                                   |
| 21/32"  | 1/2"    | 29,06 | 152     | 76      | 1                                                                                   |
| 11/16"  | 1/2"    | 32,15 | 152     | 76      | 1                                                                                   |
| 23/32"  | 1/2"    | 32,15 | 152     | 76      | 1                                                                                   |
| 3/4"    | 1/2"    | 36,10 | 152     | 76      | 1                                                                                   |
| 25/32"  | 1/2"    | 42,58 | 152     | 76      | 1                                                                                   |

| Ø<br>mm | d<br>mm | €      | L<br>mm | l<br>mm |  |
|---------|---------|--------|---------|---------|---------------------------------------------------------------------------------------|
| 13/16"  | 1/2"    | 40,80  | 152     | 76      | 1                                                                                     |
| 27/32"  | 1/2"    | 49,56  | 152     | 76      | 1                                                                                     |
| 7/8"    | 1/2"    | 54,00  | 152     | 76      | 1                                                                                     |
| 29/32"  | 1/2"    | 57,09  | 152     | 76      | 1                                                                                     |
| 15/16"  | 1/2"    | 63,56  | 152     | 76      | 1                                                                                     |
| 31/32"  | 1/2"    | 64,45  | 152     | 76      | 1                                                                                     |
| 1"      | 1/2"    | 64,45  | 152     | 76      | 1                                                                                     |
| 1-1/16" | 1/2"    | 90,35  | 152     | 76      | 1                                                                                     |
| 1-1/8"  | 1/2"    | 113,99 | 152     | 76      | 1                                                                                     |

1501

HSS Hex.



| P       |        |        |        | M    |        | K       |         |        | N       |         |       |         | S  |    | H      |        |        |
|---------|--------|--------|--------|------|--------|---------|---------|--------|---------|---------|-------|---------|----|----|--------|--------|--------|
| <800    | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500    | <800    | <1.400 | Al      | Cu      | Mg/Zn | Plastic | Ti | Ni | 50 HRC | 55 HRC | 60 HRC |
| ● 15-35 |        |        |        |      |        | ● 25-30 | ● 12-16 |        | ○ 50-60 | ● 30-60 |       | ○ 20-25 |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | L<br>mm | l<br>mm | €    |  |
|---------|---------|---------|------|-------------------------------------------------------------------------------------|
| 3,00    | 61      | 33      | 3,51 | 1                                                                                   |
| 4,00    | 75      | 43      | 3,86 | 1                                                                                   |
| 5,00    | 86      | 52      | 4,03 | 1                                                                                   |
| 6,00    | 93      | 57      | 4,34 | 1                                                                                   |

| Ø<br>mm | L<br>mm | l<br>mm | €    |  |
|---------|---------|---------|------|---------------------------------------------------------------------------------------|
| 7,00    | 109     | 69      | 4,47 | 1                                                                                     |
| 8,00    | 117     | 75      | 4,72 | 1                                                                                     |
| 9,00    | 125     | 81      | 4,78 | 1                                                                                     |
| 10,00   | 133     | 87      | 6,02 | 1                                                                                     |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1158

HSS DIN 338 NSP



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     |        |        |        |      |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 |        |        |        |      |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

V<sub>c</sub> (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €    | L<br>mm | l<br>mm |    |
|---------|------|---------|---------|----|
| 1,00    | 1,18 | 34      | 12      | 10 |
| 1,10    | 1,47 | 36      | 14      | 10 |
| 1,20    | 1,47 | 38      | 16      | 10 |
| 1,30    | 1,30 | 38      | 16      | 10 |
| 1,40    | 1,30 | 40      | 18      | 10 |
| 1,50    | 1,02 | 40      | 18      | 10 |
| 1,60    | 1,25 | 43      | 20      | 10 |
| 1,70    | 1,25 | 43      | 20      | 10 |
| 1,80    | 1,11 | 46      | 22      | 10 |
| 1,90    | 1,11 | 46      | 22      | 10 |
| 2,00    | 0,97 | 49      | 24      | 10 |
| 2,10    | 1,08 | 49      | 24      | 10 |
| 2,20    | 1,08 | 53      | 27      | 10 |
| 2,25    | 1,08 | 53      | 27      | 10 |
| 2,30    | 1,29 | 53      | 27      | 10 |
| 2,40    | 1,29 | 57      | 30      | 10 |
| 2,50    | 0,97 | 57      | 30      | 10 |
| 2,60    | 1,30 | 57      | 30      | 10 |
| 2,70    | 1,30 | 61      | 33      | 10 |
| 2,75    | 1,11 | 61      | 33      | 10 |
| 2,80    | 1,30 | 61      | 33      | 10 |
| 2,90    | 1,30 | 61      | 33      | 10 |
| 3,00    | 0,88 | 61      | 33      | 10 |
| 3,10    | 1,11 | 65      | 36      | 10 |
| 3,20    | 1,11 | 65      | 36      | 10 |
| 3,25    | 1,08 | 65      | 36      | 10 |
| 3,30    | 1,11 | 65      | 36      | 10 |
| 3,40    | 1,42 | 70      | 39      | 10 |
| 3,50    | 1,08 | 70      | 39      | 10 |
| 3,60    | 1,48 | 70      | 39      | 10 |
| 3,70    | 1,48 | 70      | 39      | 10 |
| 3,75    | 1,32 | 70      | 39      | 10 |
| 3,80    | 1,56 | 75      | 43      | 10 |
| 3,90    | 1,56 | 75      | 43      | 10 |
| 4,00    | 1,11 | 75      | 43      | 10 |
| 4,10    | 1,37 | 75      | 43      | 10 |
| 4,20    | 1,37 | 75      | 43      | 10 |
| 4,25    | 1,41 | 75      | 43      | 10 |
| 4,30    | 1,84 | 80      | 47      | 10 |
| 4,40    | 1,84 | 80      | 47      | 10 |
| 4,50    | 1,41 | 80      | 47      | 10 |
| 4,60    | 1,88 | 80      | 47      | 10 |
| 4,70    | 1,88 | 80      | 47      | 10 |
| 4,75    | 1,76 | 80      | 47      | 10 |
| 4,80    | 2,04 | 86      | 52      | 10 |
| 4,90    | 2,01 | 86      | 52      | 10 |
| 5,00    | 1,41 | 86      | 52      | 10 |
| 5,10    | 2,05 | 86      | 52      | 10 |
| 5,20    | 2,05 | 86      | 52      | 10 |
| 5,25    | 1,79 | 86      | 52      | 10 |

| Ø<br>mm | €    | L<br>mm | l<br>mm |    |
|---------|------|---------|---------|----|
| 5,30    | 2,58 | 86      | 52      | 10 |
| 5,40    | 2,58 | 93      | 57      | 10 |
| 5,50    | 1,79 | 93      | 57      | 10 |
| 5,60    | 2,71 | 93      | 57      | 10 |
| 5,70    | 2,71 | 93      | 57      | 10 |
| 5,75    | 2,25 | 93      | 57      | 10 |
| 5,80    | 2,58 | 93      | 57      | 10 |
| 5,90    | 2,58 | 93      | 57      | 10 |
| 6,00    | 1,91 | 93      | 57      | 10 |
| 6,10    | 2,96 | 101     | 63      | 10 |
| 6,20    | 2,96 | 101     | 63      | 10 |
| 6,25    | 2,67 | 101     | 63      | 10 |
| 6,30    | 3,13 | 101     | 63      | 10 |
| 6,40    | 3,18 | 101     | 63      | 10 |
| 6,50    | 2,42 | 101     | 63      | 10 |
| 6,60    | 3,91 | 101     | 63      | 10 |
| 6,70    | 3,91 | 101     | 63      | 10 |
| 6,75    | 3,06 | 109     | 69      | 10 |
| 6,80    | 2,95 | 109     | 69      | 10 |
| 6,90    | 4,32 | 109     | 69      | 10 |
| 7,00    | 2,80 | 109     | 69      | 10 |
| 7,10    | 4,59 | 109     | 69      | 10 |
| 7,20    | 4,59 | 109     | 69      | 10 |
| 7,25    | 3,50 | 109     | 69      | 10 |
| 7,30    | 4,59 | 109     | 69      | 10 |
| 7,40    | 4,59 | 109     | 69      | 10 |
| 7,50    | 3,18 | 109     | 69      | 10 |
| 7,60    | 5,39 | 117     | 75      | 10 |
| 7,70    | 5,39 | 117     | 75      | 10 |
| 7,75    | 3,82 | 117     | 75      | 10 |
| 7,80    | 5,46 | 117     | 75      | 10 |
| 7,90    | 5,46 | 117     | 75      | 10 |
| 8,00    | 3,29 | 117     | 75      | 10 |
| 8,10    | 5,54 | 117     | 75      | 10 |
| 8,20    | 5,54 | 117     | 75      | 10 |
| 8,25    | 4,55 | 117     | 75      | 10 |
| 8,30    | 5,81 | 117     | 75      | 10 |
| 8,40    | 5,81 | 117     | 75      | 10 |
| 8,50    | 4,16 | 117     | 75      | 10 |
| 8,60    | 7,30 | 125     | 81      | 10 |
| 8,70    | 7,30 | 125     | 81      | 10 |
| 8,75    | 4,95 | 125     | 81      | 10 |
| 8,80    | 7,34 | 125     | 81      | 10 |
| 8,90    | 7,34 | 125     | 81      | 10 |
| 9,00    | 4,54 | 125     | 81      | 10 |
| 9,10    | 7,36 | 125     | 81      | 10 |
| 9,20    | 7,36 | 125     | 81      | 10 |
| 9,25    | 6,08 | 125     | 81      | 10 |
| 9,30    | 6,86 | 125     | 81      | 10 |
| 9,40    | 6,86 | 125     | 81      | 10 |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

(continúa Ref.1158 / suite Réf.1158 / Ref.1158 cont'd)

| Ø<br>mm | €     | L<br>mm | I<br>mm |  |
|---------|-------|---------|---------|-----------------------------------------------------------------------------------|
| 9,50    | 5,08  | 125     | 81      | 10                                                                                |
| 9,60    | 8,78  | 133     | 87      | 10                                                                                |
| 9,70    | 8,78  | 133     | 87      | 10                                                                                |
| 9,75    | 6,22  | 133     | 87      | 10                                                                                |
| 9,80    | 8,65  | 133     | 87      | 10                                                                                |
| 9,90    | 8,65  | 133     | 87      | 10                                                                                |
| 10,00   | 5,17  | 133     | 87      | 5                                                                                 |
| 10,50   | 6,39  | 133     | 87      | 5                                                                                 |
| 11,00   | 7,11  | 142     | 94      | 5                                                                                 |
| 11,50   | 7,89  | 142     | 94      | 5                                                                                 |
| 12,00   | 8,35  | 151     | 101     | 5                                                                                 |
| 12,50   | 9,36  | 151     | 101     | 5                                                                                 |
| 13,00   | 10,24 | 151     | 101     | 5                                                                                 |
| 13,50   | 12,96 | 151     | 101     | 4                                                                                 |

| Ø<br>mm | €     | L<br>mm | I<br>mm |  |
|---------|-------|---------|---------|-------------------------------------------------------------------------------------|
| 14,00   | 14,04 | 169     | 108     | 4                                                                                   |
| 14,50   | 16,00 | 169     | 114     | 4                                                                                   |
| 15,00   | 18,28 | 169     | 114     | 4                                                                                   |
| 15,50   | 22,05 | 178     | 120     | 1                                                                                   |
| 16,00   | 22,05 | 178     | 120     | 1                                                                                   |
| 16,50   | 28,48 | 184     | 125     | 1                                                                                   |
| 17,00   | 28,48 | 184     | 125     | 1                                                                                   |
| 17,50   | 31,73 | 191     | 130     | 1                                                                                   |
| 18,00   | 31,73 | 191     | 130     | 1                                                                                   |
| 18,50   | 35,41 | 198     | 125     | 1                                                                                   |
| 19,00   | 35,41 | 198     | 125     | 1                                                                                   |
| 19,50   | 42,43 | 205     | 140     | 1                                                                                   |
| 20,00   | 42,43 | 205     | 140     | 1                                                                                   |

1158/9

**HSS DIN 338 NSP**



| P          |        |        |        | M    |        | K          |            |        | N          |            |       |            | S  |    | H      |        |        |
|------------|--------|--------|--------|------|--------|------------|------------|--------|------------|------------|-------|------------|----|----|--------|--------|--------|
| <800       | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500       | <800       | <1.400 | Al         | Cu         | Mg/Zn | Plastic    | Ti | Ni | 50 HRC | 55 HRC | 60 HRC |
| ●<br>15-35 |        |        |        |      |        | ●<br>25-30 | ●<br>12-16 |        | ○<br>50-60 | ○<br>30-60 |       | ○<br>20-25 |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €    | L<br>mm | I<br>mm |  |
|---------|------|---------|---------|-------------------------------------------------------------------------------------|
| 1/16"   | 1,02 | 43      | 20      | 10                                                                                  |
| 5/64"   | 0,97 | 49      | 24      | 10                                                                                  |
| 3/32"   | 0,97 | 57      | 30      | 10                                                                                  |
| 7/64"   | 1,11 | 61      | 33      | 10                                                                                  |
| 1/8"    | 0,88 | 65      | 36      | 10                                                                                  |
| 9/64"   | 1,08 | 70      | 39      | 10                                                                                  |
| 5/32"   | 1,11 | 75      | 43      | 10                                                                                  |
| 11/64"  | 1,41 | 80      | 47      | 10                                                                                  |
| 3/16"   | 1,41 | 86      | 52      | 10                                                                                  |
| 13/64"  | 1,41 | 86      | 52      | 10                                                                                  |
| 7/32"   | 1,79 | 93      | 57      | 10                                                                                  |
| 15/64"  | 1,91 | 93      | 57      | 10                                                                                  |
| 1/4"    | 2,42 | 101     | 63      | 10                                                                                  |
| 17/64"  | 2,80 | 109     | 69      | 10                                                                                  |
| 9/32"   | 2,80 | 109     | 69      | 10                                                                                  |

| Ø<br>mm | €     | L<br>mm | I<br>mm |  |
|---------|-------|---------|---------|---------------------------------------------------------------------------------------|
| 19/64"  | 3,18  | 117     | 75      | 10                                                                                    |
| 5/16"   | 3,29  | 117     | 75      | 10                                                                                    |
| 21/64"  | 4,16  | 117     | 75      | 10                                                                                    |
| 11/32"  | 4,54  | 125     | 81      | 10                                                                                    |
| 23/64"  | 4,54  | 125     | 81      | 10                                                                                    |
| 3/8"    | 5,08  | 133     | 87      | 10                                                                                    |
| 25/64"  | 5,17  | 133     | 87      | 10                                                                                    |
| 13/32"  | 6,39  | 133     | 87      | 5                                                                                     |
| 27/64"  | 6,71  | 142     | 94      | 5                                                                                     |
| 7/16"   | 7,11  | 142     | 94      | 5                                                                                     |
| 29/64"  | 7,89  | 142     | 94      | 5                                                                                     |
| 15/32"  | 8,35  | 151     | 101     | 5                                                                                     |
| 31/64"  | 9,36  | 151     | 101     | 5                                                                                     |
| 1/2"    | 10,24 | 151     | 101     | 5                                                                                     |



# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1108

HSS DIN 338 NSP



| P       |         |        |        | M    |        | K       |         |        | N       |         |         |         | S  |    | H      |        |        |
|---------|---------|--------|--------|------|--------|---------|---------|--------|---------|---------|---------|---------|----|----|--------|--------|--------|
| <800    | <1.000  | <1.200 | <1.400 | <950 | <1.200 | <500    | <800    | <1.400 | Al      | Cu      | Mg/Zn   | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ● 20-45 | ● 15-30 |        |        |      |        | ● 35-40 | ● 15-20 |        | ○ 65-90 | ● 40-70 | ○ 65-90 | ○ 25-35 |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø mm | €    | L mm | l mm |    |
|------|------|------|------|----|
| 1,00 | 2,40 | 34   | 12   | 10 |
| 1,10 | 2,14 | 36   | 14   | 10 |
| 1,20 | 2,14 | 38   | 16   | 10 |
| 1,30 | 2,14 | 38   | 16   | 10 |
| 1,40 | 2,14 | 40   | 18   | 10 |
| 1,50 | 1,86 | 40   | 18   | 10 |
| 1,60 | 2,14 | 43   | 20   | 10 |
| 1,70 | 2,14 | 43   | 20   | 10 |
| 1,80 | 2,14 | 46   | 22   | 10 |
| 1,90 | 2,14 | 46   | 22   | 10 |
| 2,00 | 1,86 | 49   | 24   | 10 |
| 2,10 | 2,14 | 49   | 24   | 10 |
| 2,20 | 2,14 | 53   | 27   | 10 |
| 2,25 | 2,14 | 53   | 27   | 10 |
| 2,30 | 2,14 | 53   | 27   | 10 |
| 2,40 | 2,14 | 57   | 30   | 10 |
| 2,50 | 1,86 | 57   | 30   | 10 |
| 2,60 | 2,14 | 57   | 30   | 10 |
| 2,70 | 2,14 | 61   | 33   | 10 |
| 2,75 | 1,86 | 61   | 33   | 10 |
| 2,80 | 2,14 | 61   | 33   | 10 |
| 2,90 | 2,14 | 61   | 33   | 10 |
| 3,00 | 2,03 | 61   | 33   | 10 |
| 3,10 | 2,39 | 65   | 36   | 10 |
| 3,20 | 2,39 | 65   | 36   | 10 |
| 3,25 | 2,07 | 65   | 36   | 10 |
| 3,30 | 2,39 | 65   | 36   | 10 |
| 3,40 | 2,39 | 70   | 39   | 10 |
| 3,50 | 2,25 | 70   | 39   | 10 |
| 3,60 | 2,64 | 70   | 39   | 10 |
| 3,70 | 2,64 | 70   | 39   | 10 |
| 3,75 | 2,33 | 70   | 39   | 10 |
| 3,80 | 2,64 | 75   | 43   | 10 |
| 3,90 | 2,64 | 75   | 43   | 10 |
| 4,00 | 2,54 | 75   | 43   | 10 |
| 4,10 | 3,18 | 75   | 43   | 10 |
| 4,20 | 3,18 | 75   | 43   | 10 |
| 4,25 | 2,77 | 75   | 43   | 10 |
| 4,30 | 2,77 | 80   | 47   | 10 |
| 4,40 | 2,77 | 80   | 47   | 10 |
| 4,50 | 2,77 | 80   | 47   | 10 |
| 4,60 | 2,77 | 80   | 47   | 10 |
| 4,70 | 2,77 | 80   | 47   | 10 |
| 4,75 | 2,99 | 80   | 47   | 10 |
| 4,80 | 2,99 | 86   | 52   | 10 |
| 4,90 | 3,00 | 86   | 52   | 10 |
| 5,00 | 2,86 | 86   | 52   | 10 |
| 5,10 | 3,43 | 86   | 52   | 10 |
| 5,20 | 3,43 | 86   | 52   | 10 |
| 5,25 | 3,43 | 86   | 52   | 10 |

| Ø mm | €     | L mm | l mm |    |
|------|-------|------|------|----|
| 5,30 | 3,43  | 86   | 52   | 10 |
| 5,40 | 3,43  | 93   | 57   | 10 |
| 5,50 | 3,43  | 93   | 57   | 10 |
| 5,60 | 3,79  | 93   | 57   | 10 |
| 5,70 | 3,79  | 93   | 57   | 10 |
| 5,75 | 3,79  | 93   | 57   | 10 |
| 5,80 | 3,79  | 93   | 57   | 10 |
| 5,90 | 3,79  | 93   | 57   | 10 |
| 6,00 | 3,79  | 93   | 57   | 10 |
| 6,10 | 4,66  | 101  | 63   | 10 |
| 6,20 | 4,66  | 101  | 63   | 10 |
| 6,25 | 4,66  | 101  | 63   | 10 |
| 6,30 | 4,66  | 101  | 63   | 10 |
| 6,40 | 4,66  | 101  | 63   | 10 |
| 6,50 | 4,66  | 101  | 63   | 10 |
| 6,60 | 5,39  | 101  | 63   | 10 |
| 6,70 | 5,39  | 101  | 63   | 10 |
| 6,75 | 5,41  | 109  | 69   | 10 |
| 6,80 | 6,23  | 109  | 69   | 10 |
| 6,90 | 6,23  | 109  | 69   | 10 |
| 7,00 | 6,23  | 109  | 69   | 10 |
| 7,10 | 6,23  | 109  | 69   | 10 |
| 7,20 | 6,23  | 109  | 69   | 10 |
| 7,25 | 6,75  | 109  | 69   | 10 |
| 7,30 | 6,75  | 109  | 69   | 10 |
| 7,40 | 6,75  | 109  | 69   | 10 |
| 7,50 | 6,75  | 109  | 69   | 10 |
| 7,60 | 7,05  | 117  | 75   | 10 |
| 7,70 | 7,05  | 117  | 75   | 10 |
| 7,75 | 7,05  | 117  | 75   | 10 |
| 7,80 | 7,11  | 117  | 75   | 10 |
| 7,90 | 7,11  | 117  | 75   | 10 |
| 8,00 | 7,11  | 117  | 75   | 10 |
| 8,10 | 8,22  | 117  | 75   | 10 |
| 8,20 | 8,22  | 117  | 75   | 10 |
| 8,25 | 8,22  | 117  | 75   | 10 |
| 8,30 | 8,22  | 117  | 75   | 10 |
| 8,40 | 8,22  | 117  | 75   | 10 |
| 8,50 | 8,22  | 117  | 75   | 10 |
| 8,60 | 8,96  | 125  | 81   | 10 |
| 8,70 | 8,96  | 125  | 81   | 10 |
| 8,75 | 8,97  | 125  | 81   | 10 |
| 8,80 | 8,96  | 125  | 81   | 10 |
| 8,90 | 8,96  | 125  | 81   | 10 |
| 9,00 | 8,97  | 125  | 81   | 10 |
| 9,10 | 10,12 | 125  | 81   | 10 |
| 9,20 | 10,12 | 125  | 81   | 10 |
| 9,25 | 10,11 | 125  | 81   | 10 |
| 9,30 | 10,12 | 125  | 81   | 10 |
| 9,40 | 10,12 | 125  | 81   | 10 |

(continúa Ref.1108 / suite Réf.1108 / Ref.1108 cont'd)



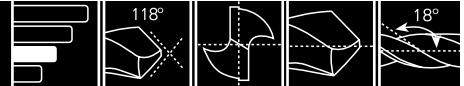
# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

(continúa Ref.1108 / suite Réf.1108 / Ref.1108 cont'd)

| Ø<br>mm | €     | L<br>mm | l<br>mm |  |
|---------|-------|---------|---------|-----------------------------------------------------------------------------------|
| 9,50    | 10,11 | 125     | 81      | 10                                                                                |
| 9,60    | 11,26 | 133     | 87      | 10                                                                                |
| 9,75    | 11,26 | 133     | 87      | 10                                                                                |
| 9,80    | 11,26 | 133     | 87      | 10                                                                                |
| 9,90    | 11,26 | 133     | 87      | 10                                                                                |
| 10,00   | 11,26 | 133     | 87      | 5                                                                                 |

| Ø<br>mm | €     | L<br>mm | l<br>mm |  |
|---------|-------|---------|---------|-------------------------------------------------------------------------------------|
| 10,50   | 13,01 | 133     | 87      | 5                                                                                   |
| 11,00   | 14,55 | 142     | 94      | 5                                                                                   |
| 11,50   | 16,15 | 142     | 94      | 5                                                                                   |
| 12,00   | 18,55 | 151     | 101     | 5                                                                                   |
| 12,50   | 19,60 | 151     | 101     | 5                                                                                   |
| 13,00   | 21,40 | 151     | 101     | 5                                                                                   |

## 1103 HSS DIN 338 H



| P    |        |        |        | M    |        | K    |      |        | N  |    |       |         | S  |    | H      |        |        |
|------|--------|--------|--------|------|--------|------|------|--------|----|----|-------|---------|----|----|--------|--------|--------|
| <800 | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500 | <800 | <1.400 | Al | Cu | Mg/Zn | Plastic | Ti | Ni | 50 HRC | 55 HRC | 60 HRC |
|      |        |        |        |      |        |      |      |        |    | ●  |       |         |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternative / Alternative



| Ø<br>mm | €     | L<br>mm | l<br>mm |  |
|---------|-------|---------|---------|------------------------------------------------------------------------------------|
| 1,00    | 3,83  | 34      | 12      | 1                                                                                  |
| 1,25    | 4,32  | 38      | 16      | 1                                                                                  |
| 1,50    | 3,75  | 40      | 18      | 1                                                                                  |
| 1,75    | 4,21  | 46      | 22      | 1                                                                                  |
| 2,00    | 3,43  | 49      | 24      | 1                                                                                  |
| 2,25    | 4,02  | 53      | 27      | 1                                                                                  |
| 2,50    | 3,50  | 57      | 30      | 1                                                                                  |
| 2,75    | 4,70  | 61      | 33      | 1                                                                                  |
| 3,00    | 3,83  | 61      | 33      | 1                                                                                  |
| 3,25    | 4,70  | 65      | 36      | 1                                                                                  |
| 3,50    | 4,13  | 70      | 39      | 1                                                                                  |
| 3,75    | 6,09  | 70      | 39      | 1                                                                                  |
| 4,00    | 4,43  | 75      | 43      | 1                                                                                  |
| 4,25    | 6,63  | 75      | 43      | 1                                                                                  |
| 4,50    | 5,46  | 80      | 47      | 1                                                                                  |
| 4,75    | 7,48  | 80      | 47      | 1                                                                                  |
| 5,00    | 5,94  | 86      | 52      | 1                                                                                  |
| 5,25    | 8,95  | 86      | 52      | 1                                                                                  |
| 5,50    | 7,19  | 93      | 57      | 1                                                                                  |
| 5,75    | 10,94 | 93      | 57      | 1                                                                                  |
| 6,00    | 7,79  | 93      | 57      | 1                                                                                  |
| 6,25    | 10,94 | 101     | 63      | 1                                                                                  |

| Ø<br>mm | €     | L<br>mm | l<br>mm |  |
|---------|-------|---------|---------|--------------------------------------------------------------------------------------|
| 6,50    | 8,68  | 101     | 63      | 1                                                                                    |
| 6,75    | 13,18 | 109     | 69      | 1                                                                                    |
| 7,00    | 9,17  | 109     | 69      | 1                                                                                    |
| 7,25    | 17,40 | 109     | 69      | 1                                                                                    |
| 7,50    | 10,78 | 109     | 69      | 1                                                                                    |
| 7,75    | 20,13 | 117     | 75      | 1                                                                                    |
| 8,00    | 11,49 | 117     | 75      | 1                                                                                    |
| 8,25    | 21,50 | 117     | 75      | 1                                                                                    |
| 8,50    | 13,31 | 117     | 75      | 1                                                                                    |
| 8,75    | 22,51 | 125     | 81      | 1                                                                                    |
| 9,00    | 13,98 | 125     | 81      | 1                                                                                    |
| 9,25    | 29,01 | 125     | 81      | 1                                                                                    |
| 9,50    | 16,36 | 125     | 81      | 1                                                                                    |
| 9,75    | 32,10 | 133     | 87      | 1                                                                                    |
| 10,00   | 17,09 | 133     | 87      | 1                                                                                    |
| 10,50   | 20,48 | 133     | 87      | 1                                                                                    |
| 11,00   | 22,87 | 142     | 94      | 1                                                                                    |
| 11,50   | 27,65 | 142     | 94      | 1                                                                                    |
| 12,00   | 29,81 | 151     | 101     | 1                                                                                    |
| 12,50   | 33,79 | 151     | 101     | 1                                                                                    |
| 13,00   | 36,17 | 151     | 101     | 1                                                                                    |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1105

HSSCO DIN 338 N



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        | ○    |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 | 12-20  | 6-16   |        | 8-14 |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €    | L<br>mm | l<br>mm |    |
|---------|------|---------|---------|----|
| 0,50    | 2,80 | 22      | 6       | 10 |
| 0,60    | 2,27 | 24      | 7       | 10 |
| 0,70    | 2,21 | 28      | 9       | 10 |
| 0,75    | 2,21 | 28      | 9       | 10 |
| 0,80    | 2,00 | 30      | 10      | 10 |
| 0,90    | 2,00 | 32      | 11      | 10 |
| 1,00    | 1,75 | 34      | 12      | 10 |
| 1,10    | 1,52 | 36      | 14      | 10 |
| 1,20    | 1,69 | 38      | 16      | 10 |
| 1,25    | 2,00 | 38      | 16      | 10 |
| 1,30    | 1,60 | 38      | 16      | 10 |
| 1,40    | 1,51 | 40      | 18      | 10 |
| 1,50    | 1,60 | 40      | 18      | 10 |
| 1,60    | 1,67 | 43      | 20      | 10 |
| 1,70    | 1,54 | 43      | 20      | 10 |
| 1,75    | 2,25 | 46      | 22      | 10 |
| 1,80    | 1,54 | 46      | 22      | 10 |
| 1,90    | 1,59 | 46      | 22      | 10 |
| 2,00    | 1,64 | 49      | 24      | 10 |
| 2,10    | 1,79 | 49      | 24      | 10 |
| 2,20    | 1,79 | 53      | 27      | 10 |
| 2,25    | 2,59 | 53      | 27      | 10 |
| 2,30    | 1,79 | 53      | 27      | 10 |
| 2,40    | 1,80 | 57      | 30      | 10 |
| 2,50    | 1,75 | 57      | 30      | 10 |
| 2,60    | 1,88 | 57      | 30      | 10 |
| 2,70    | 1,88 | 61      | 33      | 10 |
| 2,75    | 1,93 | 61      | 33      | 10 |
| 2,80    | 1,90 | 61      | 33      | 10 |
| 2,90    | 1,93 | 61      | 33      | 10 |
| 3,00    | 1,46 | 61      | 33      | 10 |
| 3,10    | 1,93 | 65      | 36      | 10 |
| 3,20    | 1,93 | 65      | 36      | 10 |
| 3,25    | 1,95 | 65      | 36      | 10 |
| 3,30    | 2,04 | 65      | 36      | 10 |
| 3,40    | 2,07 | 70      | 39      | 10 |
| 3,50    | 1,93 | 70      | 39      | 10 |
| 3,60    | 2,12 | 70      | 39      | 10 |
| 3,70    | 2,14 | 70      | 39      | 10 |
| 3,75    | 2,32 | 70      | 39      | 10 |
| 3,80    | 2,16 | 75      | 43      | 10 |
| 3,90    | 2,22 | 75      | 43      | 10 |
| 4,00    | 1,90 | 75      | 43      | 10 |
| 4,10    | 2,25 | 75      | 43      | 10 |
| 4,20    | 2,27 | 75      | 43      | 10 |
| 4,25    | 2,22 | 75      | 43      | 10 |
| 4,30    | 2,42 | 80      | 47      | 10 |
| 4,40    | 2,48 | 80      | 47      | 10 |
| 4,50    | 2,32 | 80      | 47      | 10 |
| 4,60    | 2,54 | 80      | 47      | 10 |
| 4,70    | 2,59 | 80      | 47      | 10 |
| 4,75    | 2,58 | 80      | 47      | 10 |

| Ø<br>mm | €    | L<br>mm | l<br>mm |    |
|---------|------|---------|---------|----|
| 4,80    | 2,67 | 86      | 52      | 10 |
| 4,90    | 2,69 | 86      | 52      | 10 |
| 5,00    | 2,22 | 86      | 52      | 10 |
| 5,10    | 2,72 | 86      | 52      | 10 |
| 5,20    | 2,73 | 86      | 52      | 10 |
| 5,25    | 2,78 | 86      | 52      | 10 |
| 5,30    | 2,78 | 86      | 52      | 10 |
| 5,40    | 3,21 | 93      | 57      | 10 |
| 5,50    | 3,51 | 93      | 57      | 10 |
| 5,60    | 3,51 | 93      | 57      | 10 |
| 5,70    | 3,51 | 93      | 57      | 10 |
| 5,75    | 3,51 | 93      | 57      | 10 |
| 5,80    | 3,51 | 93      | 57      | 10 |
| 5,90    | 3,51 | 93      | 57      | 10 |
| 6,00    | 3,00 | 93      | 57      | 10 |
| 6,10    | 3,90 | 101     | 63      | 10 |
| 6,20    | 3,93 | 101     | 63      | 10 |
| 6,25    | 3,93 | 101     | 63      | 10 |
| 6,30    | 3,93 | 101     | 63      | 10 |
| 6,40    | 4,23 | 101     | 63      | 10 |
| 6,50    | 3,90 | 101     | 63      | 10 |
| 6,60    | 4,23 | 101     | 63      | 10 |
| 6,70    | 4,23 | 101     | 63      | 10 |
| 6,75    | 4,55 | 109     | 69      | 10 |
| 6,80    | 4,55 | 109     | 69      | 10 |
| 6,90    | 4,55 | 109     | 69      | 10 |
| 7,00    | 4,11 | 109     | 69      | 10 |
| 7,10    | 5,55 | 109     | 69      | 10 |
| 7,20    | 5,55 | 109     | 69      | 10 |
| 7,25    | 5,55 | 109     | 69      | 10 |
| 7,30    | 5,55 | 109     | 69      | 10 |
| 7,40    | 5,55 | 109     | 69      | 10 |
| 7,50    | 4,37 | 109     | 69      | 10 |
| 7,60    | 6,73 | 117     | 75      | 10 |
| 7,70    | 6,73 | 117     | 75      | 10 |
| 7,75    | 6,73 | 117     | 75      | 10 |
| 7,80    | 6,73 | 117     | 75      | 10 |
| 7,90    | 6,73 | 117     | 75      | 10 |
| 8,00    | 5,46 | 117     | 75      | 10 |
| 8,10    | 6,73 | 117     | 75      | 10 |
| 8,20    | 6,73 | 117     | 75      | 10 |
| 8,25    | 6,45 | 117     | 75      | 10 |
| 8,30    | 6,73 | 117     | 75      | 10 |
| 8,40    | 6,73 | 117     | 75      | 10 |
| 8,50    | 5,36 | 117     | 75      | 10 |
| 8,60    | 7,89 | 125     | 81      | 10 |
| 8,70    | 7,89 | 125     | 81      | 10 |
| 8,75    | 8,20 | 125     | 81      | 10 |
| 8,80    | 8,20 | 125     | 81      | 10 |
| 8,90    | 8,20 | 125     | 81      | 10 |
| 9,00    | 6,78 | 125     | 81      | 10 |
| 9,10    | 8,78 | 125     | 81      | 10 |

**P** Aceros  
Steels

**M** Aceros Inox  
Aciers Inox  
Stainless Steels

**K** Fundición  
Fonte  
Cast Iron

**N** Metales no ferrosos  
Métal non Ferreux  
Non Ferrous metals

**S** Titanio y Superalloys  
Titanium et Superalloys  
Titanium and Superalloys

**H** Materiales Duros  
Materiaux Durs  
Hard materials

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

(continúa Ref.1105 / suite Réf.1105 / Ref.1105 cont'd)

| Ø<br>mm | €     | L<br>mm | l<br>mm |  |
|---------|-------|---------|---------|-----------------------------------------------------------------------------------|
| 9,20    | 8,78  | 125     | 81      | 10                                                                                |
| 9,25    | 9,05  | 125     | 81      | 10                                                                                |
| 9,30    | 9,67  | 125     | 81      | 10                                                                                |
| 9,40    | 9,67  | 125     | 81      | 10                                                                                |
| 9,50    | 8,56  | 125     | 81      | 10                                                                                |
| 9,60    | 10,83 | 133     | 87      | 10                                                                                |
| 9,70    | 11,09 | 133     | 87      | 10                                                                                |
| 9,75    | 10,68 | 133     | 87      | 10                                                                                |
| 9,80    | 11,10 | 133     | 87      | 10                                                                                |
| 9,90    | 11,10 | 133     | 87      | 10                                                                                |
| 10,00   | 8,56  | 133     | 87      | 5                                                                                 |
| 10,10   | 14,04 | 133     | 87      | 5                                                                                 |
| 10,20   | 14,04 | 133     | 87      | 5                                                                                 |
| 10,25   | 14,04 | 133     | 87      | 5                                                                                 |
| 10,30   | 14,04 | 133     | 87      | 5                                                                                 |
| 10,40   | 14,04 | 133     | 87      | 5                                                                                 |
| 10,50   | 11,41 | 133     | 87      | 5                                                                                 |
| 10,60   | 16,33 | 133     | 87      | 5                                                                                 |
| 10,70   | 16,33 | 142     | 94      | 5                                                                                 |
| 10,75   | 16,33 | 142     | 94      | 5                                                                                 |
| 10,80   | 16,33 | 142     | 94      | 5                                                                                 |
| 10,90   | 16,33 | 142     | 94      | 5                                                                                 |
| 11,00   | 12,56 | 142     | 94      | 5                                                                                 |
| 11,10   | 19,14 | 142     | 94      | 5                                                                                 |
| 11,20   | 19,14 | 142     | 94      | 5                                                                                 |
| 11,25   | 19,14 | 142     | 94      | 5                                                                                 |
| 11,30   | 19,14 | 142     | 94      | 5                                                                                 |
| 11,40   | 19,14 | 142     | 94      | 5                                                                                 |
| 11,50   | 16,10 | 142     | 94      | 5                                                                                 |
| 11,60   | 20,58 | 142     | 94      | 5                                                                                 |
| 11,70   | 20,58 | 142     | 94      | 5                                                                                 |

| Ø<br>mm | €     | L<br>mm | l<br>mm |  |
|---------|-------|---------|---------|-------------------------------------------------------------------------------------|
| 11,75   | 20,58 | 142     | 94      | 5                                                                                   |
| 11,80   | 20,58 | 142     | 94      | 5                                                                                   |
| 11,90   | 20,58 | 151     | 101     | 5                                                                                   |
| 12,00   | 15,77 | 151     | 101     | 5                                                                                   |
| 12,10   | 24,57 | 151     | 101     | 5                                                                                   |
| 12,20   | 24,57 | 151     | 101     | 5                                                                                   |
| 12,25   | 24,57 | 151     | 101     | 5                                                                                   |
| 12,30   | 24,57 | 151     | 101     | 5                                                                                   |
| 12,40   | 24,57 | 151     | 101     | 5                                                                                   |
| 12,50   | 21,63 | 151     | 101     | 5                                                                                   |
| 12,60   | 25,65 | 151     | 101     | 5                                                                                   |
| 12,70   | 25,65 | 151     | 101     | 5                                                                                   |
| 12,75   | 25,65 | 151     | 101     | 5                                                                                   |
| 12,80   | 25,65 | 151     | 101     | 5                                                                                   |
| 12,90   | 25,65 | 151     | 101     | 5                                                                                   |
| 13,00   | 21,92 | 151     | 101     | 5                                                                                   |
| 13,50   | 24,17 | 160     | 108     | 4                                                                                   |
| 14,00   | 23,89 | 160     | 108     | 4                                                                                   |
| 14,50   | 33,85 | 169     | 114     | 4                                                                                   |
| 15,00   | 34,41 | 169     | 114     | 4                                                                                   |
| 15,50   | 39,76 | 178     | 120     | 1                                                                                   |
| 16,00   | 41,25 | 178     | 120     | 1                                                                                   |
| 16,50   | 47,19 | 184     | 125     | 1                                                                                   |
| 17,00   | 47,19 | 184     | 125     | 1                                                                                   |
| 17,50   | 52,23 | 191     | 130     | 1                                                                                   |
| 18,00   | 56,93 | 191     | 130     | 1                                                                                   |
| 18,50   | 62,84 | 198     | 125     | 1                                                                                   |
| 19,00   | 62,84 | 198     | 125     | 1                                                                                   |
| 19,50   | 69,69 | 205     | 140     | 1                                                                                   |
| 20,00   | 80,52 | 205     | 140     | 1                                                                                   |

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**HSSCO DIN 338 N**



| P       |         |        |        | M      |        | K       |         |        | N       |         |       |         | S  |    | H      |        |        |
|---------|---------|--------|--------|--------|--------|---------|---------|--------|---------|---------|-------|---------|----|----|--------|--------|--------|
| <800    | <1.000  | <1.200 | <1.400 | <950   | <1.200 | <500    | <800    | <1.400 | Al      | Cu      | Mg/Zn | Plastic | Ti | Ni | 50 HRC | 55 HRC | 60 HRC |
| ● 15-35 | ● 12-20 | ● 6-16 |        | ○ 8-14 |        | ● 25-30 | ● 12-16 |        | ○ 50-60 | ● 30-60 |       | ○ 20-25 |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €    | L<br>mm | l<br>mm |  |
|---------|------|---------|---------|-------------------------------------------------------------------------------------|
| 1/16"   | 1,59 | 43      | 20      | 10                                                                                  |
| 5/64"   | 1,64 | 49      | 24      | 10                                                                                  |
| 3/32"   | 1,75 | 57      | 30      | 10                                                                                  |
| 7/64"   | 1,93 | 61      | 33      | 10                                                                                  |
| 1/8"    | 1,46 | 65      | 36      | 10                                                                                  |
| 9/64"   | 1,93 | 70      | 39      | 10                                                                                  |
| 5/32"   | 1,90 | 75      | 43      | 10                                                                                  |
| 11/64"  | 2,32 | 80      | 47      | 10                                                                                  |
| 3/16"   | 2,32 | 86      | 52      | 10                                                                                  |
| 13/64"  | 2,22 | 86      | 52      | 10                                                                                  |
| 7/32"   | 3,51 | 93      | 57      | 10                                                                                  |
| 15/64"  | 3,00 | 93      | 57      | 10                                                                                  |
| 1/4"    | 3,90 | 101     | 63      | 10                                                                                  |
| 17/64"  | 4,55 | 109     | 69      | 10                                                                                  |
| 9/32"   | 4,11 | 109     | 69      | 10                                                                                  |

| Ø<br>mm | €     | L<br>mm | l<br>mm |  |
|---------|-------|---------|---------|---------------------------------------------------------------------------------------|
| 19/64"  | 4,37  | 117     | 75      | 10                                                                                    |
| 5/16"   | 5,46  | 117     | 75      | 10                                                                                    |
| 21/64"  | 5,36  | 117     | 75      | 10                                                                                    |
| 11/32"  | 8,20  | 125     | 81      | 10                                                                                    |
| 23/64"  | 6,78  | 125     | 81      | 10                                                                                    |
| 3/8"    | 8,56  | 133     | 87      | 10                                                                                    |
| 25/64"  | 8,56  | 133     | 87      | 10                                                                                    |
| 13/32"  | 11,41 | 133     | 87      | 5                                                                                     |
| 27/64"  | 16,33 | 142     | 94      | 5                                                                                     |
| 7/16"   | 12,56 | 142     | 94      | 5                                                                                     |
| 29/64"  | 16,10 | 142     | 94      | 5                                                                                     |
| 15/32"  | 15,77 | 151     | 101     | 5                                                                                     |
| 31/64"  | 21,63 | 151     | 101     | 5                                                                                     |
| 1/2"    | 21,92 | 151     | 101     | 5                                                                                     |

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**HSSCO DIN 338 N**



| P       |         |         |        | M       |        | K       |         |        | N       |         |       |         | S  |    | H      |        |        |
|---------|---------|---------|--------|---------|--------|---------|---------|--------|---------|---------|-------|---------|----|----|--------|--------|--------|
| <800    | <1.000  | <1.200  | <1.400 | <950    | <1.200 | <500    | <800    | <1.400 | Al      | Cu      | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ● 25-50 | ● 18-30 | ● 10-25 |        | ○ 12-20 |        | ● 38-45 | ● 18-25 |        | ○ 70-80 | ● 45-80 |       | ○ 30-35 |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €    | L<br>mm | I<br>mm |   |
|---------|------|---------|---------|---|
| 2,00    | 3,48 | 49      | 24      | 1 |
| 2,50    | 3,48 | 57      | 30      | 1 |
| 3,00    | 3,44 | 61      | 33      | 1 |
| 3,10    | 4,33 | 65      | 36      | 1 |
| 3,25    | 4,33 | 65      | 36      | 1 |
| 3,30    | 4,33 | 65      | 36      | 1 |
| 3,40    | 4,51 | 70      | 39      | 1 |
| 3,50    | 4,32 | 70      | 39      | 1 |
| 4,00    | 4,46 | 75      | 43      | 1 |
| 4,10    | 4,69 | 75      | 43      | 1 |
| 4,20    | 4,69 | 75      | 43      | 1 |
| 4,25    | 4,69 | 75      | 43      | 1 |
| 4,30    | 4,73 | 80      | 47      | 1 |
| 4,50    | 4,75 | 80      | 47      | 1 |
| 5,00    | 4,83 | 86      | 52      | 1 |
| 5,10    | 5,19 | 86      | 52      | 1 |
| 5,25    | 5,24 | 86      | 52      | 1 |

| Ø<br>mm | €     | L<br>mm | I<br>mm |   |
|---------|-------|---------|---------|---|
| 5,50    | 5,47  | 93      | 57      | 1 |
| 6,00    | 5,68  | 93      | 57      | 1 |
| 6,50    | 10,45 | 101     | 63      | 1 |
| 7,00    | 11,07 | 109     | 69      | 1 |
| 7,50    | 11,34 | 109     | 69      | 1 |
| 8,00    | 12,09 | 117     | 75      | 1 |
| 8,50    | 13,47 | 117     | 75      | 1 |
| 9,00    | 14,94 | 125     | 81      | 1 |
| 9,50    | 15,19 | 125     | 81      | 1 |
| 10,00   | 15,94 | 133     | 87      | 1 |
| 10,50   | 27,46 | 133     | 87      | 1 |
| 11,00   | 28,61 | 142     | 94      | 1 |
| 11,50   | 30,37 | 142     | 94      | 1 |
| 12,00   | 31,39 | 151     | 101     | 1 |
| 12,50   | 38,81 | 151     | 101     | 1 |
| 13,00   | 39,45 | 151     | 101     | 1 |

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**HSSCO DIN 338 MR**



| P       |         |        |        | M      |        | K       |         |        | N       |         |       |         | S  |    | H      |        |        |
|---------|---------|--------|--------|--------|--------|---------|---------|--------|---------|---------|-------|---------|----|----|--------|--------|--------|
| <800    | <1.000  | <1.200 | <1.400 | <950   | <1.200 | <500    | <800    | <1.400 | Al      | Cu      | Mg/Zn | Plastic | Ti | Ni | 50 HRC | 55 HRC | 60 HRC |
| ● 15-35 | ● 12-20 | ● 6-16 |        | ○ 8-14 |        | ● 25-30 | ● 12-16 |        | ○ 50-60 | ● 30-60 |       | ○ 20-25 |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | d<br>mm | €     | L<br>mm | I<br>mm |   |
|---------|---------|-------|---------|---------|---|
| 10,00   | 8       | 10,17 | 133     | 87      | 1 |
| 10,50   | 8       | 13,61 | 133     | 87      | 1 |
| 11,00   | 8       | 14,67 | 142     | 94      | 1 |
| 11,50   | 8       | 18,01 | 142     | 94      | 1 |
| 12,00   | 8       | 19,09 | 151     | 101     | 1 |
| 12,50   | 8       | 23,17 | 151     | 101     | 1 |
| 13,00   | 10      | 23,49 | 151     | 101     | 1 |
| 13,50   | 10      | 25,59 | 160     | 108     | 1 |
| 14,00   | 10      | 25,33 | 160     | 108     | 1 |
| 14,50   | 10      | 34,69 | 169     | 114     | 1 |
| 15,00   | 10      | 35,18 | 169     | 114     | 1 |

| Ø<br>mm | d<br>mm | €     | L<br>mm | I<br>mm |   |
|---------|---------|-------|---------|---------|---|
| 15,50   | 10      | 40,19 | 178     | 120     | 1 |
| 16,00   | 12      | 41,62 | 178     | 120     | 1 |
| 16,50   | 12      | 47,18 | 184     | 125     | 1 |
| 17,00   | 12      | 47,18 | 184     | 125     | 1 |
| 17,50   | 12      | 51,91 | 191     | 130     | 1 |
| 18,00   | 12      | 56,31 | 191     | 130     | 1 |
| 18,50   | 12      | 61,90 | 191     | 130     | 1 |
| 19,00   | 12      | 61,90 | 191     | 130     | 1 |
| 19,50   | 12      | 68,31 | 191     | 130     | 1 |
| 20,00   | 12      | 78,47 | 191     | 130     | 1 |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

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**HSSCO ANSI**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        | ○    |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 | 12-20  | 6-16   |        | 8-14 |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | d<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|---------|-------|---------|---------|---|
| 17/32"  | 1/2"    | 25,59 | 152     | 76      | 1 |
| 9/16"   | 1/2"    | 25,33 | 152     | 76      | 1 |
| 19/32"  | 1/2"    | 35,18 | 152     | 76      | 1 |
| 5/8"    | 1/2"    | 41,62 | 152     | 76      | 1 |
| 21/32"  | 1/2"    | 47,18 | 152     | 76      | 1 |

| Ø<br>mm | d<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|---------|-------|---------|---------|---|
| 11/16"  | 1/2"    | 51,91 | 152     | 76      | 1 |
| 23/32"  | 1/2"    | 56,41 | 152     | 76      | 1 |
| 3/4"    | 1/2"    | 61,90 | 152     | 76      | 1 |
| 25/32"  | 1/2"    | 68,31 | 152     | 76      | 1 |
| 13/16"  | 1/2"    | 78,47 | 152     | 76      | 1 |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

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**HSSCO DIN 338W**



| P     |        |        |        | M    |        | K    |      |        | N     |       |       |         | S  |      | H      |        |        |
|-------|--------|--------|--------|------|--------|------|------|--------|-------|-------|-------|---------|----|------|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500 | <800 | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti   | 50 HRC | 55 HRC | 60 HRC |
| ●     |        |        |        | ●    |        |      |      |        | ○     | ○     | ○     |         |    | ●    |        |        |        |
| 30-40 |        |        |        | 8-14 |        |      |      |        | 30-80 | 50-70 | 50-70 |         |    | 8-10 |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

**NEW**



| Ø<br>mm | €    | L<br>mm | l<br>mm |    |
|---------|------|---------|---------|----|
| 1,00    | 2,89 | 34      | 12      | 10 |
| 1,25    | 3,45 | 38      | 16      | 10 |
| 1,50    | 2,75 | 40      | 18      | 10 |
| 1,75    | 3,45 | 46      | 22      | 10 |
| 2,00    | 2,75 | 49      | 24      | 10 |
| 2,25    | 3,05 | 53      | 27      | 10 |
| 2,50    | 2,51 | 57      | 30      | 10 |
| 2,75    | 3,05 | 61      | 33      | 10 |
| 3,00    | 2,45 | 61      | 33      | 10 |
| 3,20    | 3,01 | 65      | 36      | 10 |
| 3,25    | 3,01 | 65      | 36      | 10 |
| 3,30    | 3,01 | 65      | 36      | 10 |
| 3,50    | 2,96 | 70      | 39      | 10 |
| 3,75    | 3,57 | 70      | 39      | 10 |
| 4,00    | 3,22 | 75      | 43      | 10 |
| 4,20    | 3,57 | 75      | 43      | 10 |
| 4,25    | 3,57 | 75      | 43      | 10 |
| 4,50    | 3,57 | 80      | 47      | 10 |
| 4,75    | 3,99 | 80      | 47      | 10 |
| 5,00    | 3,83 | 86      | 52      | 10 |
| 5,20    | 4,75 | 86      | 52      | 10 |
| 5,25    | 4,48 | 86      | 52      | 10 |

| Ø<br>mm | €     | L<br>mm | l<br>mm |    |
|---------|-------|---------|---------|----|
| 5,50    | 4,85  | 93      | 57      | 10 |
| 5,75    | 5,42  | 93      | 57      | 10 |
| 6,00    | 5,16  | 93      | 57      | 10 |
| 6,25    | 5,93  | 101     | 63      | 10 |
| 6,50    | 6,04  | 101     | 63      | 10 |
| 6,75    | 7,07  | 109     | 69      | 10 |
| 6,80    | 7,05  | 109     | 69      | 10 |
| 7,00    | 6,58  | 109     | 69      | 10 |
| 7,50    | 7,00  | 109     | 69      | 10 |
| 8,00    | 8,19  | 117     | 75      | 10 |
| 8,50    | 8,55  | 117     | 75      | 10 |
| 8,75    | 13,13 | 125     | 81      | 10 |
| 9,00    | 10,89 | 125     | 81      | 10 |
| 9,50    | 11,26 | 125     | 81      | 10 |
| 10,00   | 12,43 | 133     | 87      | 5  |
| 10,20   | 16,76 | 133     | 87      | 5  |
| 10,50   | 16,76 | 133     | 87      | 5  |
| 11,00   | 18,51 | 142     | 94      | 5  |
| 11,50   | 21,29 | 142     | 94      | 5  |
| 12,00   | 22,83 | 151     | 101     | 5  |
| 12,50   | 25,41 | 151     | 101     | 5  |
| 13,00   | 25,79 | 151     | 101     | 5  |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1106

**HSSCO DIN 338 W**



| P    |        |        |        | M         |        | K    |      |        | N          |            |            |         | S  |           | H      |        |        |
|------|--------|--------|--------|-----------|--------|------|------|--------|------------|------------|------------|---------|----|-----------|--------|--------|--------|
| <800 | <1.000 | <1.200 | <1.400 | <950      | <1.200 | <500 | <800 | <1.400 | Al         | Cu         | Mg/Zn      | Plastic | Ni | Ti        | 50 HRC | 55 HRC | 60 HRC |
|      |        |        |        | ●<br>8-14 |        |      |      |        | ○<br>30-80 | ○<br>50-70 | ○<br>50-70 |         |    | ●<br>8-10 |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €    | L<br>mm | l<br>mm |    |
|---------|------|---------|---------|----|
| 1,00    | 2,95 | 34      | 12      | 10 |
| 1,25    | 3,49 | 38      | 16      | 10 |
| 1,50    | 2,81 | 40      | 18      | 10 |
| 2,00    | 2,81 | 49      | 24      | 10 |
| 2,25    | 3,40 | 53      | 27      | 10 |
| 2,50    | 2,80 | 57      | 30      | 10 |
| 2,75    | 4,35 | 61      | 33      | 10 |
| 3,00    | 3,11 | 61      | 33      | 10 |
| 3,10    | 3,38 | 65      | 36      | 10 |
| 3,20    | 3,38 | 65      | 36      | 10 |
| 3,25    | 3,44 | 65      | 36      | 10 |
| 3,30    | 4,31 | 65      | 36      | 10 |
| 3,50    | 3,38 | 70      | 39      | 10 |
| 3,75    | 3,99 | 70      | 39      | 10 |
| 4,00    | 3,83 | 75      | 43      | 10 |
| 4,10    | 4,78 | 75      | 43      | 10 |
| 4,20    | 4,78 | 75      | 43      | 10 |
| 4,25    | 4,44 | 75      | 43      | 10 |
| 4,50    | 4,44 | 80      | 47      | 10 |
| 4,75    | 4,41 | 80      | 47      | 10 |
| 5,00    | 4,67 | 86      | 52      | 10 |
| 5,10    | 5,94 | 86      | 52      | 10 |
| 5,20    | 5,31 | 86      | 52      | 10 |

| Ø<br>mm | €     | L<br>mm | l<br>mm |    |
|---------|-------|---------|---------|----|
| 5,25    | 5,81  | 86      | 52      | 10 |
| 5,50    | 5,68  | 93      | 57      | 10 |
| 5,75    | 6,43  | 93      | 57      | 10 |
| 6,00    | 6,31  | 93      | 57      | 10 |
| 6,25    | 6,63  | 101     | 63      | 10 |
| 6,50    | 7,51  | 101     | 63      | 10 |
| 6,75    | 7,91  | 109     | 69      | 10 |
| 7,00    | 8,73  | 109     | 69      | 10 |
| 7,25    | 10,08 | 109     | 69      | 10 |
| 7,50    | 9,94  | 109     | 69      | 10 |
| 8,00    | 10,78 | 117     | 75      | 10 |
| 8,25    | 11,64 | 117     | 75      | 10 |
| 8,50    | 12,99 | 117     | 75      | 10 |
| 9,00    | 14,09 | 125     | 81      | 10 |
| 9,50    | 15,95 | 125     | 81      | 10 |
| 10,00   | 17,54 | 133     | 87      | 5  |
| 10,25   | 24,44 | 133     | 87      | 5  |
| 10,50   | 20,76 | 133     | 87      | 5  |
| 11,00   | 22,14 | 142     | 94      | 5  |
| 11,50   | 25,97 | 142     | 94      | 5  |
| 12,00   | 25,97 | 151     | 101     | 5  |
| 12,50   | 32,57 | 151     | 101     | 5  |
| 13,00   | 32,57 | 151     | 101     | 5  |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

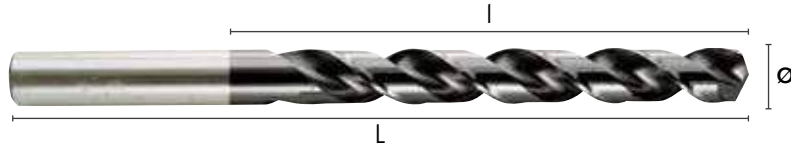
1162

**HSSCO DIN 338 W**



| P    |        |        |        | M          |        | K    |      |        | N           |    |            |         | S  |            | H      |        |        |
|------|--------|--------|--------|------------|--------|------|------|--------|-------------|----|------------|---------|----|------------|--------|--------|--------|
| <800 | <1.000 | <1.200 | <1.400 | <950       | <1.200 | <500 | <800 | <1.400 | Al          | Cu | Mg/Zn      | Plastic | Ni | Ti         | 50 HRC | 55 HRC | 60 HRC |
|      |        |        |        | ●<br>12-20 |        |      |      |        | ○<br>45-100 |    | ○<br>75-95 |         |    | ●<br>12-15 |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 1,00    | 5,61  | 34      | 12      | 1 |
| 1,25    | 6,65  | 38      | 16      | 1 |
| 1,50    | 5,34  | 40      | 18      | 1 |
| 2,00    | 5,34  | 49      | 24      | 1 |
| 2,25    | 6,47  | 53      | 27      | 1 |
| 2,50    | 5,32  | 57      | 30      | 1 |
| 2,75    | 8,28  | 61      | 33      | 1 |
| 3,00    | 5,93  | 61      | 33      | 1 |
| 3,10    | 6,44  | 65      | 36      | 1 |
| 3,20    | 6,44  | 65      | 36      | 1 |
| 3,25    | 6,55  | 65      | 36      | 1 |
| 3,30    | 8,17  | 65      | 36      | 1 |
| 3,50    | 6,45  | 70      | 39      | 1 |
| 3,75    | 7,61  | 70      | 39      | 1 |
| 4,00    | 7,30  | 75      | 43      | 1 |
| 4,10    | 9,07  | 75      | 43      | 1 |
| 4,20    | 9,07  | 75      | 43      | 1 |
| 4,25    | 8,47  | 75      | 43      | 1 |
| 4,50    | 8,47  | 80      | 47      | 1 |
| 4,75    | 8,39  | 80      | 47      | 1 |
| 5,00    | 8,89  | 86      | 52      | 1 |
| 5,10    | 11,31 | 86      | 52      | 1 |
| 5,20    | 10,11 | 86      | 52      | 1 |

| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 5,25    | 11,07 | 86      | 52      | 1 |
| 5,50    | 10,83 | 93      | 57      | 1 |
| 5,75    | 12,24 | 93      | 57      | 1 |
| 6,00    | 12,02 | 93      | 57      | 1 |
| 6,25    | 12,60 | 101     | 63      | 1 |
| 6,50    | 14,32 | 101     | 63      | 1 |
| 6,75    | 15,04 | 109     | 69      | 1 |
| 7,00    | 16,61 | 109     | 69      | 1 |
| 7,25    | 19,19 | 109     | 69      | 1 |
| 7,50    | 18,94 | 109     | 69      | 1 |
| 8,00    | 20,55 | 117     | 75      | 1 |
| 8,25    | 22,18 | 117     | 75      | 1 |
| 8,50    | 24,75 | 117     | 75      | 1 |
| 9,00    | 26,84 | 125     | 81      | 1 |
| 9,50    | 30,38 | 125     | 81      | 1 |
| 10,00   | 33,38 | 133     | 87      | 1 |
| 10,25   | 46,54 | 133     | 87      | 1 |
| 10,50   | 39,53 | 133     | 87      | 1 |
| 11,00   | 42,18 | 142     | 94      | 1 |
| 11,50   | 49,46 | 142     | 94      | 1 |
| 12,00   | 49,46 | 151     | 101     | 1 |
| 12,50   | 62,01 | 151     | 101     | 1 |
| 13,00   | 62,01 | 151     | 101     | 1 |



# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

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**HSSCO DIN 338 S**



| P     |        |        |        | M    |        | K    |      |        | N     |    |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|------|------|--------|-------|----|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500 | <800 | <1.400 | Al    | Cu | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        | ○    |        |      |      |        | ●     |    | ●     |         |    |    |        |        |        |
| 15-30 | 12-20  | 6-16   |        | 8-14 |        |      |      |        | 30-80 |    | 50-70 |         |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø mm | €    | L mm | l mm |    |
|------|------|------|------|----|
| 2,00 | 3,76 | 49   | 24   | 10 |
| 2,10 | 3,61 | 49   | 24   | 10 |
| 2,20 | 3,61 | 53   | 27   | 10 |
| 2,30 | 3,61 | 53   | 27   | 10 |
| 2,40 | 3,61 | 57   | 30   | 10 |
| 2,50 | 3,76 | 57   | 30   | 10 |
| 2,60 | 3,89 | 57   | 30   | 10 |
| 2,70 | 3,89 | 61   | 33   | 10 |
| 2,80 | 4,11 | 61   | 33   | 10 |
| 2,90 | 4,11 | 61   | 33   | 10 |
| 3,00 | 4,11 | 61   | 33   | 10 |
| 3,10 | 4,19 | 65   | 36   | 10 |
| 3,20 | 4,19 | 65   | 36   | 10 |
| 3,30 | 4,19 | 65   | 36   | 10 |
| 3,40 | 4,19 | 70   | 39   | 10 |
| 3,50 | 4,68 | 70   | 39   | 10 |
| 3,60 | 4,58 | 70   | 39   | 10 |
| 3,70 | 4,58 | 70   | 39   | 10 |
| 3,80 | 5,29 | 75   | 43   | 10 |
| 3,90 | 5,29 | 75   | 43   | 10 |
| 4,00 | 5,12 | 75   | 43   | 10 |
| 4,10 | 5,29 | 75   | 43   | 10 |
| 4,20 | 5,29 | 75   | 43   | 10 |
| 4,30 | 5,41 | 80   | 47   | 10 |
| 4,40 | 5,41 | 80   | 47   | 10 |
| 4,50 | 5,46 | 80   | 47   | 10 |
| 4,60 | 5,83 | 80   | 47   | 10 |
| 4,70 | 5,83 | 80   | 47   | 10 |
| 4,80 | 6,01 | 86   | 52   | 10 |
| 4,90 | 6,01 | 86   | 52   | 10 |
| 5,00 | 5,78 | 86   | 52   | 10 |
| 5,10 | 6,53 | 86   | 52   | 10 |
| 5,20 | 6,83 | 86   | 52   | 10 |
| 5,30 | 6,83 | 86   | 52   | 10 |
| 5,40 | 6,83 | 93   | 57   | 10 |
| 5,50 | 7,74 | 93   | 57   | 10 |
| 5,60 | 8,17 | 93   | 57   | 10 |
| 5,70 | 9,10 | 93   | 57   | 10 |
| 5,80 | 8,17 | 93   | 57   | 10 |
| 5,90 | 8,17 | 93   | 57   | 10 |

| Ø mm  | €     | L mm | l mm |    |
|-------|-------|------|------|----|
| 6,00  | 8,15  | 93   | 57   | 10 |
| 6,10  | 9,05  | 101  | 63   | 10 |
| 6,20  | 9,05  | 101  | 63   | 10 |
| 6,30  | 9,10  | 101  | 63   | 10 |
| 6,40  | 9,10  | 101  | 63   | 10 |
| 6,50  | 9,10  | 101  | 63   | 10 |
| 6,60  | 10,42 | 101  | 63   | 10 |
| 6,70  | 10,42 | 101  | 63   | 10 |
| 6,80  | 10,42 | 109  | 69   | 10 |
| 6,90  | 10,42 | 109  | 69   | 10 |
| 7,00  | 10,42 | 109  | 69   | 10 |
| 7,10  | 12,63 | 109  | 69   | 10 |
| 7,20  | 12,63 | 109  | 69   | 10 |
| 7,30  | 12,63 | 109  | 69   | 10 |
| 7,40  | 12,63 | 109  | 69   | 10 |
| 7,50  | 11,29 | 109  | 69   | 10 |
| 7,60  | 17,24 | 117  | 75   | 10 |
| 7,70  | 17,24 | 117  | 75   | 10 |
| 7,80  | 17,24 | 117  | 75   | 10 |
| 7,90  | 17,24 | 117  | 75   | 10 |
| 8,00  | 13,31 | 117  | 75   | 10 |
| 8,10  | 17,24 | 117  | 75   | 10 |
| 8,20  | 15,09 | 117  | 75   | 10 |
| 8,30  | 16,21 | 117  | 75   | 10 |
| 8,40  | 16,21 | 117  | 75   | 10 |
| 8,50  | 14,66 | 117  | 75   | 10 |
| 8,60  | 18,59 | 125  | 81   | 10 |
| 8,70  | 18,59 | 125  | 81   | 10 |
| 8,80  | 18,59 | 125  | 81   | 10 |
| 8,90  | 18,59 | 125  | 81   | 10 |
| 9,00  | 17,24 | 125  | 81   | 10 |
| 9,50  | 18,57 | 125  | 81   | 10 |
| 9,80  | 23,30 | 133  | 87   | 10 |
| 10,00 | 21,18 | 133  | 87   | 5  |
| 10,50 | 26,06 | 133  | 87   | 5  |
| 11,00 | 32,26 | 142  | 94   | 5  |
| 11,50 | 39,13 | 142  | 94   | 5  |
| 12,00 | 40,37 | 151  | 101  | 5  |
| 12,50 | 44,05 | 151  | 101  | 5  |
| 13,00 | 44,05 | 151  | 101  | 5  |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

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**HSSCO DIN 338 S**



| P     |        |        |        | M     |        | K    |      |        | N      |    |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|-------|--------|------|------|--------|--------|----|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500 | <800 | <1.400 | Al     | Cu | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        | ○     |        |      |      |        | ●      |    | ●     |         |    |    |        |        |        |
| 25-45 | 18-30  | 10-25  |        | 12-20 |        |      |      |        | 45-100 |    | 70-90 |         |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 2,00    | 5,27  | 49      | 24      | 1 |
| 2,10    | 5,07  | 49      | 24      | 1 |
| 2,20    | 5,07  | 53      | 27      | 1 |
| 2,30    | 5,07  | 53      | 27      | 1 |
| 2,40    | 5,07  | 57      | 30      | 1 |
| 2,50    | 5,27  | 57      | 30      | 1 |
| 2,60    | 5,43  | 57      | 30      | 1 |
| 2,70    | 5,43  | 61      | 33      | 1 |
| 2,80    | 5,75  | 61      | 33      | 1 |
| 2,90    | 5,75  | 61      | 33      | 1 |
| 3,00    | 5,75  | 61      | 33      | 1 |
| 3,10    | 5,88  | 65      | 36      | 1 |
| 3,20    | 5,88  | 65      | 36      | 1 |
| 3,30    | 5,88  | 65      | 36      | 1 |
| 3,40    | 5,88  | 70      | 39      | 1 |
| 3,50    | 6,54  | 70      | 39      | 1 |
| 3,60    | 6,42  | 70      | 39      | 1 |
| 3,70    | 6,42  | 70      | 39      | 1 |
| 3,80    | 7,41  | 75      | 43      | 1 |
| 3,90    | 7,41  | 75      | 43      | 1 |
| 4,00    | 7,16  | 75      | 43      | 1 |
| 4,10    | 7,41  | 75      | 43      | 1 |
| 4,20    | 7,41  | 75      | 43      | 1 |
| 4,30    | 7,57  | 80      | 47      | 1 |
| 4,40    | 7,66  | 80      | 47      | 1 |
| 4,50    | 7,66  | 80      | 47      | 1 |
| 4,60    | 8,16  | 80      | 47      | 1 |
| 4,70    | 8,16  | 80      | 47      | 1 |
| 4,80    | 8,42  | 86      | 52      | 1 |
| 4,90    | 8,42  | 86      | 52      | 1 |
| 5,00    | 8,08  | 86      | 52      | 1 |
| 5,10    | 9,14  | 86      | 52      | 1 |
| 5,20    | 9,58  | 86      | 52      | 1 |
| 5,30    | 9,58  | 86      | 52      | 1 |
| 5,40    | 9,58  | 93      | 57      | 1 |
| 5,50    | 10,84 | 93      | 57      | 1 |
| 5,60    | 11,46 | 93      | 57      | 1 |
| 5,70    | 12,73 | 93      | 57      | 1 |
| 5,80    | 11,46 | 93      | 57      | 1 |
| 5,90    | 11,46 | 93      | 57      | 1 |

| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 6,00    | 11,41 | 93      | 57      | 1 |
| 6,10    | 12,66 | 101     | 63      | 1 |
| 6,20    | 12,66 | 101     | 63      | 1 |
| 6,30    | 12,73 | 101     | 63      | 1 |
| 6,40    | 12,73 | 101     | 63      | 1 |
| 6,50    | 12,73 | 101     | 63      | 1 |
| 6,60    | 14,59 | 101     | 63      | 1 |
| 6,70    | 14,59 | 101     | 63      | 1 |
| 6,80    | 14,59 | 109     | 69      | 1 |
| 6,90    | 14,59 | 109     | 69      | 1 |
| 7,00    | 14,30 | 109     | 69      | 1 |
| 7,10    | 17,68 | 109     | 69      | 1 |
| 7,20    | 17,68 | 109     | 69      | 1 |
| 7,30    | 17,68 | 109     | 69      | 1 |
| 7,40    | 17,68 | 109     | 69      | 1 |
| 7,50    | 15,80 | 109     | 69      | 1 |
| 7,60    | 24,15 | 117     | 75      | 1 |
| 7,70    | 24,15 | 117     | 75      | 1 |
| 7,80    | 24,15 | 117     | 75      | 1 |
| 7,90    | 24,15 | 117     | 75      | 1 |
| 8,00    | 18,64 | 117     | 75      | 1 |
| 8,10    | 24,15 | 117     | 75      | 1 |
| 8,20    | 21,12 | 117     | 75      | 1 |
| 8,30    | 24,15 | 117     | 75      | 1 |
| 8,40    | 24,15 | 117     | 75      | 1 |
| 8,50    | 20,51 | 117     | 75      | 1 |
| 8,60    | 26,04 | 125     | 81      | 1 |
| 8,70    | 26,04 | 125     | 81      | 1 |
| 8,80    | 26,04 | 125     | 81      | 1 |
| 8,90    | 26,04 | 125     | 81      | 1 |
| 9,00    | 24,15 | 125     | 81      | 1 |
| 9,50    | 26,00 | 125     | 81      | 1 |
| 9,80    | 32,63 | 133     | 87      | 1 |
| 10,00   | 29,64 | 133     | 87      | 1 |
| 10,50   | 36,49 | 133     | 87      | 1 |
| 11,00   | 45,15 | 142     | 94      | 1 |
| 11,50   | 54,79 | 142     | 94      | 1 |
| 12,00   | 56,50 | 151     | 101     | 1 |
| 12,50   | 58,55 | 151     | 101     | 1 |
| 13,00   | 61,68 | 151     | 101     | 1 |

**P**

Aceros  
Aciers  
Steels

**M**

Aceros Inox  
Aciers Inox  
Stainless Steels

**K**

Fundición  
Fonte  
Cast Iron

**N**

Metales no ferrosos  
Métal non Ferreux  
Non Ferrous metals

**S**

Titanio y Superalloys  
Titanium et Superalloys  
Titanium and Superalloys

**H**

Materiales Duros  
Materiels Durs  
Hard materials

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

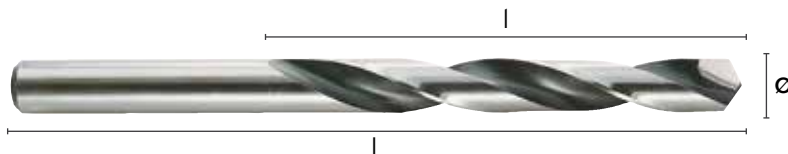
1110

**HSS DIN 338 N - WIDIA**



| P          |            |            |          | M    |        | K    |            |            | N  |    |       |            | S  |    | H      |        |        |
|------------|------------|------------|----------|------|--------|------|------------|------------|----|----|-------|------------|----|----|--------|--------|--------|
| <800       | <1.000     | <1.200     | <1.400   | <950 | <1.200 | <500 | <800       | <1.400     | Al | Cu | Mg/Zn | Plastic    | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●<br>25-45 | ●<br>18-30 | ●<br>10-25 | ○<br>6-9 |      |        |      | ●<br>30-40 | ●<br>15-20 |    |    |       | ○<br>30-35 |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 1,50    | 27,05 | 40      | 18      | 1 |
| 2,00    | 20,55 | 49      | 24      | 1 |
| 2,50    | 20,55 | 57      | 30      | 1 |
| 3,00    | 20,55 | 61      | 33      | 1 |
| 3,50    | 20,55 | 70      | 39      | 1 |
| 4,00    | 20,55 | 75      | 43      | 1 |
| 4,50    | 21,01 | 80      | 47      | 1 |
| 5,00    | 21,01 | 86      | 52      | 1 |
| 5,50    | 22,22 | 93      | 57      | 1 |
| 6,00    | 23,30 | 93      | 57      | 1 |
| 6,50    | 27,65 | 101     | 63      | 1 |
| 7,00    | 27,65 | 109     | 69      | 1 |
| 7,50    | 28,75 | 109     | 69      | 1 |
| 8,00    | 28,75 | 117     | 75      | 1 |
| 8,50    | 31,46 | 117     | 75      | 1 |

| Ø<br>mm | €      | L<br>mm | l<br>mm |   |
|---------|--------|---------|---------|---|
| 9,00    | 31,46  | 125     | 81      | 1 |
| 9,50    | 34,39  | 125     | 81      | 1 |
| 10,00   | 34,39  | 133     | 87      | 1 |
| 10,50   | 44,32  | 133     | 87      | 1 |
| 11,00   | 44,32  | 142     | 97      | 1 |
| 12,00   | 51,00  | 151     | 101     | 1 |
| 13,00   | 60,93  | 151     | 101     | 1 |
| 14,00   | 71,00  | 160     | 108     | 1 |
| 15,00   | 80,86  | 169     | 114     | 1 |
| 16,00   | 93,10  | 178     | 120     | 1 |
| 17,00   | 101,93 | 184     | 125     | 1 |
| 18,00   | 109,75 | 191     | 130     | 1 |
| 19,00   | 136,30 | 198     | 135     | 1 |
| 20,00   | 155,16 | 205     | 140     | 1 |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1112

HSS DIN 340 N



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     |        |        |        |      |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 |        |        |        |      |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €    | L<br>mm | l<br>mm |    |
|---------|------|---------|---------|----|
| 1,00    | 3,23 | 56      | 33      | 10 |
| 1,10    | 3,91 | 60      | 37      | 10 |
| 1,20    | 3,91 | 65      | 41      | 10 |
| 1,25    | 3,55 | 65      | 41      | 10 |
| 1,30    | 3,91 | 65      | 41      | 10 |
| 1,40    | 3,91 | 70      | 45      | 10 |
| 1,50    | 3,23 | 70      | 45      | 10 |
| 1,60    | 3,32 | 76      | 50      | 10 |
| 1,70    | 3,03 | 76      | 50      | 10 |
| 1,75    | 3,03 | 80      | 53      | 10 |
| 1,80    | 3,32 | 80      | 53      | 10 |
| 1,90    | 3,32 | 80      | 53      | 10 |
| 2,00    | 2,77 | 85      | 56      | 10 |
| 2,10    | 3,32 | 85      | 56      | 10 |
| 2,20    | 3,32 | 85      | 56      | 10 |
| 2,25    | 3,03 | 90      | 59      | 10 |
| 2,30    | 3,32 | 90      | 59      | 10 |
| 2,40    | 3,32 | 95      | 62      | 10 |
| 2,50    | 2,77 | 95      | 62      | 10 |
| 2,60    | 3,32 | 100     | 66      | 10 |
| 2,70    | 3,32 | 100     | 66      | 10 |
| 2,75    | 3,03 | 100     | 66      | 10 |
| 2,80    | 3,32 | 100     | 66      | 10 |
| 2,90    | 3,32 | 100     | 66      | 10 |
| 3,00    | 2,51 | 100     | 66      | 10 |
| 3,10    | 3,96 | 106     | 69      | 10 |
| 3,20    | 3,96 | 106     | 69      | 10 |
| 3,25    | 3,60 | 106     | 69      | 10 |
| 3,30    | 3,96 | 106     | 69      | 10 |
| 3,40    | 3,96 | 112     | 73      | 10 |
| 3,50    | 3,27 | 112     | 73      | 10 |
| 3,60    | 3,96 | 112     | 73      | 10 |
| 3,70    | 3,96 | 112     | 73      | 10 |
| 3,75    | 3,60 | 112     | 73      | 10 |
| 3,80    | 3,96 | 119     | 78      | 10 |
| 3,90    | 3,96 | 119     | 78      | 10 |
| 4,00    | 3,06 | 119     | 78      | 10 |
| 4,10    | 5,06 | 119     | 78      | 10 |
| 4,20    | 5,06 | 119     | 78      | 10 |
| 4,25    | 4,61 | 119     | 78      | 10 |
| 4,30    | 5,06 | 126     | 82      | 10 |
| 4,40    | 5,06 | 126     | 82      | 10 |
| 4,50    | 4,26 | 126     | 82      | 10 |
| 4,60    | 5,06 | 126     | 82      | 10 |
| 4,70    | 5,06 | 126     | 82      | 10 |
| 4,75    | 4,61 | 126     | 82      | 10 |
| 4,80    | 5,06 | 132     | 87      | 10 |
| 4,90    | 5,06 | 132     | 87      | 10 |
| 5,00    | 3,94 | 132     | 87      | 10 |
| 5,10    | 6,03 | 132     | 87      | 10 |
| 5,20    | 6,03 | 132     | 87      | 10 |

| Ø<br>mm | €     | L<br>mm | l<br>mm |    |
|---------|-------|---------|---------|----|
| 5,25    | 5,48  | 132     | 87      | 10 |
| 5,30    | 6,03  | 132     | 87      | 10 |
| 5,40    | 6,03  | 139     | 91      | 10 |
| 5,50    | 4,95  | 139     | 91      | 10 |
| 5,60    | 6,03  | 139     | 91      | 10 |
| 5,70    | 6,03  | 139     | 91      | 10 |
| 5,75    | 5,48  | 139     | 91      | 10 |
| 5,80    | 6,03  | 139     | 91      | 10 |
| 5,90    | 6,03  | 139     | 91      | 10 |
| 6,00    | 4,85  | 139     | 91      | 10 |
| 6,10    | 7,65  | 148     | 97      | 10 |
| 6,20    | 7,65  | 148     | 97      | 10 |
| 6,25    | 6,95  | 148     | 97      | 10 |
| 6,30    | 7,65  | 148     | 97      | 10 |
| 6,40    | 8,34  | 148     | 97      | 10 |
| 6,50    | 6,33  | 148     | 97      | 10 |
| 6,60    | 7,65  | 148     | 97      | 10 |
| 6,70    | 7,65  | 148     | 97      | 10 |
| 6,75    | 6,95  | 156     | 102     | 10 |
| 6,80    | 8,84  | 156     | 102     | 10 |
| 6,90    | 8,84  | 156     | 102     | 10 |
| 7,00    | 6,33  | 156     | 102     | 10 |
| 7,10    | 9,35  | 156     | 102     | 10 |
| 7,20    | 9,35  | 156     | 102     | 10 |
| 7,25    | 8,52  | 156     | 102     | 10 |
| 7,30    | 9,35  | 156     | 102     | 10 |
| 7,40    | 9,35  | 156     | 102     | 10 |
| 7,50    | 7,73  | 156     | 102     | 10 |
| 7,60    | 9,35  | 165     | 109     | 10 |
| 7,70    | 9,35  | 165     | 109     | 10 |
| 7,75    | 8,52  | 165     | 109     | 10 |
| 7,80    | 9,35  | 165     | 109     | 10 |
| 7,90    | 9,35  | 165     | 109     | 10 |
| 8,00    | 7,73  | 165     | 109     | 10 |
| 8,10    | 11,53 | 165     | 109     | 10 |
| 8,20    | 11,53 | 165     | 109     | 10 |
| 8,25    | 10,48 | 165     | 109     | 10 |
| 8,30    | 11,53 | 165     | 109     | 10 |
| 8,40    | 11,53 | 165     | 109     | 10 |
| 8,50    | 9,51  | 165     | 109     | 10 |
| 8,75    | 10,48 | 175     | 115     | 10 |
| 8,80    | 11,53 | 175     | 115     | 10 |
| 8,90    | 12,02 | 175     | 115     | 10 |
| 9,00    | 9,51  | 175     | 115     | 10 |
| 9,25    | 12,18 | 175     | 115     | 10 |
| 9,30    | 13,43 | 175     | 115     | 10 |
| 9,40    | 13,43 | 175     | 115     | 10 |
| 9,50    | 11,11 | 175     | 115     | 10 |
| 9,70    | 13,43 | 184     | 121     | 10 |
| 9,75    | 12,18 | 184     | 121     | 10 |
| 9,90    | 13,43 | 184     | 121     | 10 |

(continúa Ref.1112 / suite Réf.1112 / Ref.1112 cont'd)

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

(continúa Ref.1112 / suite Réf.1112 / Ref.1112 cont'd)

| Ø<br>mm | €     | L<br>mm | l<br>mm |  |
|---------|-------|---------|---------|-----------------------------------------------------------------------------------|
| 10,00   | 11,11 | 184     | 121     | 5                                                                                 |
| 10,25   | 16,66 | 184     | 121     | 5                                                                                 |
| 10,30   | 23,71 | 184     | 121     | 5                                                                                 |
| 10,40   | 18,34 | 184     | 121     | 5                                                                                 |
| 10,50   | 15,17 | 184     | 121     | 5                                                                                 |
| 10,75   | 16,66 | 195     | 128     | 5                                                                                 |
| 11,00   | 15,17 | 195     | 128     | 5                                                                                 |
| 11,10   | 21,74 | 195     | 128     | 5                                                                                 |
| 11,20   | 21,74 | 195     | 128     | 5                                                                                 |
| 11,25   | 19,77 | 195     | 128     | 5                                                                                 |
| 11,50   | 17,98 | 195     | 128     | 5                                                                                 |
| 11,75   | 19,77 | 195     | 128     | 5                                                                                 |
| 12,00   | 17,98 | 205     | 134     | 5                                                                                 |
| 12,25   | 23,78 | 205     | 134     | 5                                                                                 |
| 12,50   | 21,61 | 205     | 134     | 5                                                                                 |
| 12,75   | 23,78 | 205     | 134     | 5                                                                                 |
| 13,00   | 21,61 | 205     | 134     | 5                                                                                 |

| Ø<br>mm | €     | L<br>mm | l<br>mm |  |
|---------|-------|---------|---------|-------------------------------------------------------------------------------------|
| 13,25   | 29,70 | 214     | 140     | 1                                                                                   |
| 13,50   | 27,00 | 214     | 140     | 1                                                                                   |
| 13,75   | 29,70 | 214     | 140     | 1                                                                                   |
| 14,00   | 27,00 | 214     | 140     | 1                                                                                   |
| 14,50   | 30,08 | 220     | 144     | 1                                                                                   |
| 15,00   | 30,08 | 220     | 144     | 1                                                                                   |
| 15,50   | 32,87 | 227     | 149     | 1                                                                                   |
| 16,00   | 32,87 | 227     | 149     | 1                                                                                   |
| 16,50   | 45,11 | 235     | 154     | 1                                                                                   |
| 17,00   | 45,11 | 235     | 154     | 1                                                                                   |
| 17,50   | 49,77 | 241     | 158     | 1                                                                                   |
| 18,00   | 49,77 | 241     | 158     | 1                                                                                   |
| 18,50   | 56,68 | 247     | 162     | 1                                                                                   |
| 19,00   | 56,68 | 247     | 162     | 1                                                                                   |
| 19,50   | 61,26 | 254     | 166     | 1                                                                                   |
| 20,00   | 61,26 | 254     | 166     | 1                                                                                   |

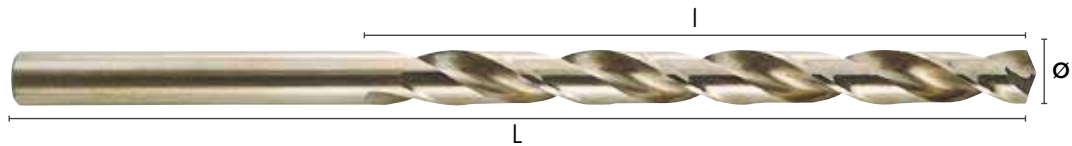
**1113**

**HSSCO DIN 340 N**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        | ○    |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 | 12-20  | 6-16   |        | 8-14 |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | l<br>mm |  |
|---------|-------|---------|---------|-------------------------------------------------------------------------------------|
| 2,00    | 6,58  | 85      | 56      | 10                                                                                  |
| 2,50    | 6,58  | 95      | 62      | 10                                                                                  |
| 3,00    | 6,58  | 100     | 66      | 10                                                                                  |
| 3,25    | 11,47 | 106     | 69      | 10                                                                                  |
| 3,50    | 7,81  | 112     | 73      | 10                                                                                  |
| 3,75    | 7,81  | 112     | 73      | 10                                                                                  |
| 4,00    | 7,81  | 119     | 78      | 10                                                                                  |
| 4,25    | 9,07  | 119     | 78      | 10                                                                                  |
| 4,50    | 10,01 | 126     | 82      | 10                                                                                  |
| 4,75    | 12,43 | 126     | 82      | 10                                                                                  |
| 5,00    | 10,01 | 132     | 87      | 10                                                                                  |
| 5,25    | 21,81 | 132     | 87      | 10                                                                                  |
| 5,50    | 10,96 | 139     | 91      | 10                                                                                  |
| 5,75    | 14,82 | 139     | 91      | 10                                                                                  |
| 6,00    | 10,96 | 139     | 91      | 10                                                                                  |

| Ø<br>mm | €     | L<br>mm | l<br>mm |  |
|---------|-------|---------|---------|---------------------------------------------------------------------------------------|
| 6,50    | 13,91 | 148     | 97      | 10                                                                                    |
| 7,00    | 15,12 | 156     | 102     | 10                                                                                    |
| 7,50    | 18,51 | 156     | 102     | 10                                                                                    |
| 8,00    | 17,00 | 165     | 109     | 10                                                                                    |
| 8,50    | 21,01 | 165     | 109     | 10                                                                                    |
| 9,00    | 21,01 | 175     | 115     | 10                                                                                    |
| 9,50    | 24,45 | 175     | 115     | 10                                                                                    |
| 10,00   | 32,95 | 184     | 121     | 5                                                                                     |
| 10,50   | 41,48 | 184     | 121     | 5                                                                                     |
| 11,00   | 43,05 | 195     | 128     | 5                                                                                     |
| 11,50   | 55,83 | 195     | 128     | 5                                                                                     |
| 12,00   | 46,25 | 205     | 134     | 5                                                                                     |
| 12,50   | 59,01 | 205     | 134     | 5                                                                                     |
| 13,00   | 59,01 | 204     | 134     | 5                                                                                     |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1114

**HSSCO DIN 340 S**



| P     |        |        |        | M    |        | K    |      |        | N     |    |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|------|------|--------|-------|----|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500 | <800 | <1.400 | Al    | Cu | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        | ○    |        |      |      |        | ●     |    | ●     |         |    |    |        |        |        |
| 15-30 | 12-20  | 6-16   |        | 8-14 |        |      |      |        | 30-80 |    | 50-70 |         |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 2,00    | 9,10  | 85      | 56      | 1 |
| 2,10    | 8,45  | 85      | 56      | 1 |
| 2,30    | 8,78  | 90      | 59      | 1 |
| 2,50    | 9,10  | 95      | 62      | 1 |
| 2,70    | 9,26  | 100     | 66      | 1 |
| 3,00    | 9,44  | 100     | 66      | 1 |
| 3,10    | 10,84 | 106     | 69      | 1 |
| 3,20    | 10,84 | 106     | 69      | 1 |
| 3,30    | 10,84 | 106     | 69      | 1 |
| 3,50    | 10,50 | 112     | 73      | 1 |
| 3,60    | 11,45 | 112     | 73      | 1 |
| 3,70    | 11,72 | 112     | 73      | 1 |
| 4,00    | 10,42 | 119     | 78      | 1 |
| 4,10    | 13,47 | 119     | 78      | 1 |
| 4,20    | 13,47 | 119     | 78      | 1 |
| 4,30    | 15,14 | 126     | 82      | 1 |
| 4,50    | 12,06 | 126     | 82      | 1 |
| 4,70    | 14,98 | 126     | 82      | 1 |
| 4,80    | 15,67 | 132     | 87      | 1 |
| 5,00    | 12,97 | 132     | 87      | 1 |
| 5,10    | 16,29 | 132     | 87      | 1 |
| 5,20    | 16,26 | 132     | 87      | 1 |
| 5,50    | 15,03 | 139     | 91      | 1 |

| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 5,60    | 19,28 | 139     | 91      | 1 |
| 5,80    | 19,75 | 139     | 91      | 1 |
| 6,00    | 15,99 | 139     | 91      | 1 |
| 6,20    | 24,44 | 148     | 97      | 1 |
| 6,50    | 19,83 | 148     | 97      | 1 |
| 6,80    | 31,10 | 156     | 102     | 1 |
| 7,00    | 24,49 | 156     | 102     | 1 |
| 7,20    | 30,66 | 156     | 102     | 1 |
| 7,50    | 28,16 | 156     | 102     | 1 |
| 8,00    | 28,16 | 165     | 109     | 1 |
| 8,20    | 33,33 | 165     | 109     | 1 |
| 8,50    | 32,79 | 165     | 109     | 1 |
| 8,80    | 35,55 | 175     | 115     | 1 |
| 9,00    | 34,18 | 175     | 115     | 1 |
| 9,50    | 44,75 | 175     | 115     | 1 |
| 9,80    | 61,32 | 184     | 121     | 1 |
| 10,00   | 45,73 | 184     | 121     | 1 |
| 10,50   | 71,12 | 184     | 121     | 1 |
| 11,00   | 53,54 | 195     | 128     | 1 |
| 11,50   | 99,39 | 195     | 128     | 1 |
| 12,00   | 73,85 | 195     | 128     | 1 |
| 13,00   | 92,01 | 195     | 128     | 1 |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

1164

**HSSCO DIN 340 S**



| P     |        |        |        | M     |        | K    |      |        | N      |    |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|-------|--------|------|------|--------|--------|----|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500 | <800 | <1.400 | Al     | Cu | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        | ○     |        |      |      |        | ●      |    | ●     |         |    |    |        |        |        |
| 25-45 | 18-30  | 10-25  |        | 12-20 |        |      |      |        | 45-100 |    | 70-90 |         |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 2,00    | 11,74 | 85      | 56      | 1 |
| 2,10    | 10,89 | 85      | 56      | 1 |
| 2,30    | 11,31 | 90      | 59      | 1 |
| 2,50    | 11,74 | 95      | 62      | 1 |
| 2,70    | 11,93 | 100     | 66      | 1 |
| 3,00    | 12,14 | 100     | 66      | 1 |
| 3,10    | 13,96 | 106     | 69      | 1 |
| 3,20    | 13,96 | 106     | 69      | 1 |
| 3,30    | 13,96 | 106     | 69      | 1 |
| 3,50    | 13,53 | 112     | 73      | 1 |
| 3,60    | 14,74 | 112     | 73      | 1 |
| 3,70    | 15,09 | 112     | 73      | 1 |
| 4,00    | 13,41 | 119     | 78      | 1 |
| 4,10    | 17,37 | 119     | 78      | 1 |
| 4,20    | 17,37 | 119     | 78      | 1 |
| 4,30    | 19,50 | 126     | 82      | 1 |
| 4,50    | 15,54 | 126     | 82      | 1 |
| 4,70    | 19,30 | 126     | 82      | 1 |
| 4,80    | 20,19 | 132     | 87      | 1 |
| 5,00    | 16,69 | 132     | 87      | 1 |
| 5,10    | 20,97 | 132     | 87      | 1 |
| 5,20    | 20,94 | 132     | 87      | 1 |
| 5,50    | 19,35 | 139     | 91      | 1 |

| Ø<br>mm | €      | L<br>mm | l<br>mm |   |
|---------|--------|---------|---------|---|
| 5,60    | 24,86  | 139     | 91      | 1 |
| 5,80    | 25,43  | 139     | 91      | 1 |
| 6,00    | 20,60  | 139     | 91      | 1 |
| 6,20    | 31,48  | 148     | 97      | 1 |
| 6,50    | 25,54  | 148     | 97      | 1 |
| 6,80    | 40,07  | 156     | 102     | 1 |
| 7,00    | 31,53  | 156     | 102     | 1 |
| 7,20    | 39,49  | 156     | 102     | 1 |
| 7,50    | 36,27  | 156     | 102     | 1 |
| 8,00    | 36,27  | 165     | 109     | 1 |
| 8,20    | 42,93  | 165     | 109     | 1 |
| 8,50    | 42,22  | 165     | 109     | 1 |
| 8,80    | 45,80  | 175     | 115     | 1 |
| 9,00    | 44,01  | 175     | 115     | 1 |
| 9,50    | 57,65  | 175     | 115     | 1 |
| 9,80    | 78,98  | 184     | 121     | 1 |
| 10,00   | 58,90  | 184     | 121     | 1 |
| 10,50   | 91,60  | 184     | 121     | 1 |
| 11,00   | 68,96  | 195     | 128     | 1 |
| 11,50   | 128,03 | 195     | 128     | 1 |
| 12,00   | 95,12  | 195     | 128     | 1 |
| 13,00   | 118,51 | 195     | 128     | 1 |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

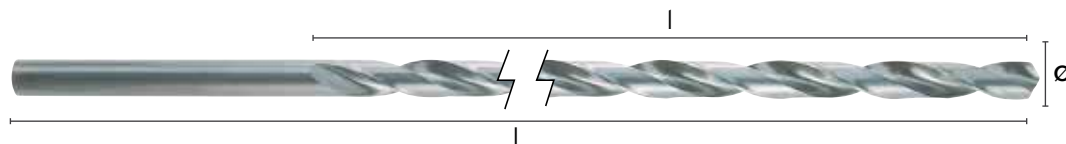
1115

HSS DIN 1869 N



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     |        |        |        |      |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 |        |        |        |      |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 2,00    | 12,02 | 125     | 85      | 1 |
| 2,50    | 12,56 | 140     | 95      | 1 |
| 3,00    | 12,98 | 150     | 100     | 1 |
| 3,00    | 13,88 | 190     | 130     | 1 |
| 3,50    | 14,65 | 165     | 115     | 1 |
| 3,50    | 16,88 | 210     | 145     | 1 |
| 3,50    | 24,17 | 265     | 180     | 1 |
| 4,00    | 14,65 | 175     | 120     | 1 |
| 4,00    | 17,29 | 220     | 150     | 1 |
| 4,00    | 24,63 | 280     | 190     | 1 |
| 4,50    | 16,23 | 185     | 125     | 1 |
| 4,50    | 20,29 | 235     | 160     | 1 |
| 4,50    | 29,02 | 295     | 200     | 1 |
| 5,00    | 17,17 | 195     | 135     | 1 |
| 5,00    | 21,80 | 245     | 170     | 1 |
| 5,00    | 26,82 | 315     | 210     | 1 |
| 5,50    | 20,34 | 205     | 140     | 1 |
| 5,50    | 29,02 | 260     | 180     | 1 |
| 5,50    | 33,53 | 330     | 235     | 1 |
| 6,00    | 20,34 | 205     | 140     | 1 |
| 6,00    | 29,02 | 260     | 180     | 1 |
| 6,00    | 33,53 | 330     | 225     | 1 |
| 6,50    | 24,17 | 215     | 150     | 1 |
| 6,50    | 31,23 | 275     | 190     | 1 |
| 6,50    | 38,92 | 350     | 235     | 1 |
| 7,00    | 25,62 | 225     | 155     | 1 |
| 7,00    | 35,67 | 290     | 210     | 1 |
| 7,00    | 48,20 | 370     | 250     | 1 |
| 7,50    | 28,85 | 225     | 155     | 1 |
| 7,50    | 38,42 | 290     | 200     | 1 |
| 7,50    | 56,00 | 370     | 250     | 1 |
| 8,00    | 31,88 | 240     | 165     | 1 |

| Ø<br>mm | €      | L<br>mm | l<br>mm |   |
|---------|--------|---------|---------|---|
| 8,00    | 44,13  | 305     | 210     | 1 |
| 8,00    | 57,47  | 390     | 265     | 1 |
| 8,50    | 43,37  | 240     | 165     | 1 |
| 8,50    | 59,10  | 305     | 210     | 1 |
| 8,50    | 81,28  | 390     | 265     | 1 |
| 9,00    | 41,36  | 250     | 175     | 1 |
| 9,00    | 54,61  | 320     | 220     | 1 |
| 9,00    | 80,17  | 410     | 280     | 1 |
| 9,50    | 48,69  | 250     | 175     | 1 |
| 9,50    | 66,93  | 320     | 220     | 1 |
| 9,50    | 90,16  | 410     | 280     | 1 |
| 10,00   | 48,06  | 265     | 185     | 1 |
| 10,00   | 62,86  | 340     | 235     | 1 |
| 10,00   | 87,35  | 430     | 295     | 1 |
| 10,50   | 91,59  | 265     | 145     | 1 |
| 10,50   | 99,26  | 340     | 250     | 1 |
| 10,50   | 105,57 | 430     | 295     | 1 |
| 11,00   | 60,85  | 280     | 195     | 1 |
| 11,00   | 89,12  | 365     | 250     | 1 |
| 11,00   | 104,34 | 455     | 310     | 1 |
| 11,50   | 85,29  | 280     | 195     | 1 |
| 11,50   | 114,50 | 365     | 250     | 1 |
| 11,50   | 118,30 | 455     | 310     | 1 |
| 12,00   | 80,35  | 295     | 205     | 1 |
| 12,00   | 100,55 | 375     | 260     | 1 |
| 12,00   | 122,83 | 480     | 315     | 1 |
| 12,50   | 99,26  | 295     | 205     | 1 |
| 12,50   | 111,15 | 375     | 260     | 1 |
| 12,50   | 134,93 | 480     | 315     | 1 |
| 13,00   | 99,26  | 295     | 205     | 1 |
| 13,00   | 114,52 | 375     | 260     | 1 |
| 13,00   | 136,21 | 480     | 315     | 1 |



# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

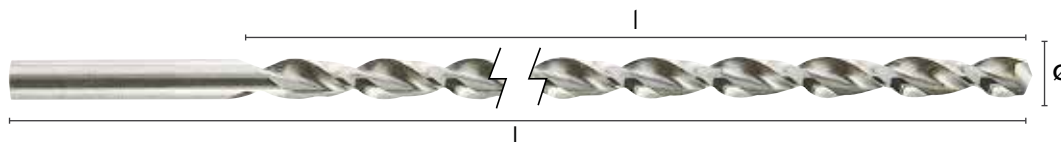
1165

**HSSCO DIN 1869 S**



| P     |        |        |        | M    |        | K    |      |        | N     |    |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|------|------|--------|-------|----|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500 | <800 | <1.400 | Al    | Cu | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      |        |        | ○    |        |      |      |        | ●     |    | ●     |         |    |    |        |        |        |
| 15-30 | 12-20  |        |        | 8-14 |        |      |      |        | 30-80 |    | 50-70 |         |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 2,00    | 18,07 | 125     | 85      | 1 |
| 2,50    | 19,71 | 140     | 95      | 1 |
| 3,00    | 19,71 | 150     | 100     | 1 |
| 3,00    | 23,01 | 190     | 130     | 1 |
| 3,00    | 36,15 | 240     | 160     | 1 |
| 3,50    | 21,36 | 165     | 115     | 1 |
| 3,50    | 24,64 | 210     | 145     | 1 |
| 3,50    | 32,87 | 265     | 180     | 1 |
| 4,00    | 23,01 | 175     | 120     | 1 |
| 4,00    | 27,94 | 220     | 150     | 1 |
| 4,00    | 32,87 | 180     | 190     | 1 |
| 4,50    | 24,64 | 185     | 125     | 1 |
| 4,50    | 31,23 | 235     | 160     | 1 |
| 4,50    | 36,15 | 295     | 200     | 1 |
| 5,00    | 26,29 | 195     | 135     | 1 |
| 5,00    | 32,87 | 245     | 170     | 1 |
| 5,00    | 39,44 | 315     | 210     | 1 |
| 5,50    | 29,58 | 205     | 140     | 1 |
| 5,50    | 37,78 | 260     | 180     | 1 |
| 5,50    | 44,37 | 330     | 225     | 1 |
| 6,00    | 27,94 | 205     | 140     | 1 |
| 6,00    | 34,51 | 260     | 180     | 1 |
| 6,00    | 42,74 | 330     | 225     | 1 |
| 6,50    | 31,23 | 215     | 150     | 1 |
| 6,50    | 39,44 | 275     | 190     | 1 |
| 6,50    | 52,57 | 350     | 235     | 1 |
| 7,00    | 36,15 | 225     | 155     | 1 |
| 7,00    | 42,74 | 290     | 200     | 1 |
| 7,00    | 57,52 | 370     | 250     | 1 |
| 7,50    | 39,44 | 225     | 155     | 1 |

| Ø<br>mm | €      | L<br>mm | l<br>mm |   |
|---------|--------|---------|---------|---|
| 7,50    | 47,65  | 290     | 200     | 1 |
| 7,50    | 62,44  | 370     | 250     | 1 |
| 8,00    | 44,37  | 240     | 165     | 1 |
| 8,00    | 52,57  | 305     | 210     | 1 |
| 8,00    | 75,60  | 390     | 265     | 1 |
| 8,50    | 46,01  | 240     | 165     | 1 |
| 8,50    | 55,86  | 305     | 210     | 1 |
| 8,50    | 78,88  | 390     | 265     | 1 |
| 9,00    | 54,22  | 250     | 175     | 1 |
| 9,00    | 65,73  | 320     | 220     | 1 |
| 9,00    | 92,03  | 410     | 280     | 1 |
| 9,50    | 55,86  | 250     | 175     | 1 |
| 9,50    | 65,73  | 320     | 220     | 1 |
| 9,50    | 96,96  | 410     | 280     | 1 |
| 10,00   | 62,44  | 265     | 185     | 1 |
| 10,00   | 87,09  | 340     | 235     | 1 |
| 10,00   | 106,80 | 430     | 295     | 1 |
| 10,50   | 65,73  | 265     | 185     | 1 |
| 10,50   | 92,03  | 340     | 235     | 1 |
| 10,50   | 110,10 | 430     | 295     | 1 |
| 11,00   | 72,29  | 280     | 195     | 1 |
| 11,00   | 100,23 | 365     | 250     | 1 |
| 11,00   | 123,24 | 455     | 310     | 1 |
| 11,50   | 82,16  | 280     | 195     | 1 |
| 11,50   | 113,38 | 365     | 250     | 1 |
| 11,50   | 138,03 | 455     | 310     | 1 |
| 12,00   | 90,37  | 275     | 205     | 1 |
| 12,00   | 123,24 | 375     | 260     | 1 |
| 12,00   | 152,82 | 480     | 330     | 1 |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

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**HSS DIN 1897 N**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     |        |        |        |      |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 |        |        |        |      |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €    | L<br>mm | l<br>mm |    |
|---------|------|---------|---------|----|
| 1,00    | 1,23 | 26      | 6       | 10 |
| 1,10    | 2,72 | 28      | 7       | 10 |
| 1,20    | 3,14 | 30      | 8       | 10 |
| 1,25    | 1,11 | 30      | 8       | 10 |
| 1,30    | 3,61 | 30      | 8       | 10 |
| 1,40    | 4,14 | 32      | 9       | 10 |
| 1,50    | 1,08 | 32      | 9       | 10 |
| 1,60    | 2,46 | 34      | 10      | 10 |
| 1,70    | 2,85 | 34      | 10      | 10 |
| 1,75    | 1,08 | 36      | 11      | 10 |
| 1,80    | 2,85 | 36      | 11      | 10 |
| 1,90    | 2,85 | 36      | 11      | 10 |
| 2,00    | 1,08 | 38      | 12      | 10 |
| 2,10    | 1,32 | 38      | 12      | 10 |
| 2,20    | 1,32 | 40      | 13      | 10 |
| 2,25    | 1,08 | 40      | 13      | 10 |
| 2,30    | 1,32 | 40      | 13      | 10 |
| 2,40    | 1,32 | 43      | 14      | 10 |
| 2,50    | 1,08 | 43      | 14      | 10 |
| 2,60    | 1,79 | 43      | 14      | 10 |
| 2,70    | 1,23 | 46      | 16      | 10 |
| 2,75    | 1,12 | 46      | 16      | 10 |
| 2,80    | 1,35 | 46      | 16      | 10 |
| 2,90    | 1,35 | 46      | 16      | 10 |
| 3,00    | 1,12 | 46      | 16      | 10 |
| 3,10    | 1,46 | 49      | 18      | 10 |
| 3,20    | 1,46 | 49      | 18      | 10 |
| 3,25    | 1,22 | 49      | 18      | 10 |
| 3,30    | 1,39 | 49      | 18      | 10 |
| 3,40    | 1,46 | 52      | 20      | 10 |
| 3,50    | 1,22 | 52      | 20      | 10 |
| 3,60    | 1,62 | 52      | 20      | 10 |
| 3,70    | 1,62 | 52      | 20      | 10 |
| 3,75    | 1,31 | 52      | 20      | 10 |
| 3,80    | 1,62 | 55      | 22      | 10 |
| 3,90    | 1,62 | 55      | 22      | 10 |
| 4,00    | 1,31 | 55      | 22      | 10 |
| 4,10    | 1,90 | 55      | 22      | 10 |
| 4,20    | 1,90 | 55      | 22      | 10 |
| 4,25    | 1,59 | 55      | 22      | 10 |
| 4,30    | 1,90 | 58      | 24      | 10 |
| 4,40    | 1,90 | 58      | 24      | 10 |
| 4,50    | 1,59 | 58      | 24      | 10 |
| 4,60    | 2,16 | 58      | 24      | 10 |
| 4,70    | 2,16 | 58      | 24      | 10 |
| 4,75    | 1,77 | 58      | 24      | 10 |
| 4,80    | 2,16 | 62      | 26      | 10 |
| 4,90    | 2,16 | 62      | 26      | 10 |
| 5,00    | 1,77 | 62      | 26      | 10 |

| Ø<br>mm | €     | L<br>mm | l<br>mm |    |
|---------|-------|---------|---------|----|
| 5,10    | 2,38  | 62      | 26      | 10 |
| 5,20    | 2,38  | 62      | 26      | 10 |
| 5,25    | 1,95  | 62      | 26      | 10 |
| 5,30    | 2,39  | 62      | 26      | 10 |
| 5,40    | 2,39  | 66      | 28      | 10 |
| 5,50    | 1,95  | 66      | 28      | 10 |
| 5,60    | 2,58  | 66      | 28      | 10 |
| 5,70    | 3,87  | 66      | 28      | 10 |
| 5,75    | 2,24  | 66      | 28      | 10 |
| 5,80    | 2,58  | 66      | 28      | 10 |
| 5,90    | 2,72  | 66      | 28      | 10 |
| 6,00    | 2,24  | 66      | 28      | 10 |
| 6,10    | 3,22  | 70      | 31      | 10 |
| 6,20    | 3,22  | 70      | 31      | 10 |
| 6,25    | 2,67  | 70      | 31      | 10 |
| 6,30    | 3,22  | 70      | 31      | 10 |
| 6,40    | 3,22  | 70      | 31      | 10 |
| 6,50    | 2,67  | 70      | 31      | 10 |
| 6,60    | 3,74  | 70      | 31      | 10 |
| 6,70    | 3,74  | 70      | 31      | 10 |
| 6,75    | 3,08  | 74      | 34      | 10 |
| 6,80    | 3,74  | 74      | 34      | 10 |
| 6,90    | 3,74  | 74      | 34      | 10 |
| 7,00    | 3,08  | 74      | 34      | 10 |
| 7,25    | 3,49  | 74      | 34      | 10 |
| 7,50    | 3,49  | 74      | 34      | 10 |
| 7,75    | 3,83  | 79      | 37      | 10 |
| 8,00    | 3,83  | 79      | 37      | 10 |
| 8,25    | 4,58  | 79      | 37      | 10 |
| 8,50    | 4,58  | 79      | 37      | 10 |
| 8,75    | 5,06  | 84      | 40      | 10 |
| 9,00    | 5,00  | 84      | 40      | 10 |
| 9,25    | 5,32  | 84      | 40      | 10 |
| 9,50    | 5,59  | 84      | 40      | 10 |
| 9,75    | 6,25  | 89      | 43      | 10 |
| 10,00   | 6,25  | 89      | 43      | 5  |
| 10,50   | 7,02  | 89      | 43      | 5  |
| 11,00   | 7,84  | 95      | 47      | 5  |
| 11,50   | 8,72  | 95      | 47      | 5  |
| 12,00   | 9,19  | 102     | 51      | 5  |
| 13,00   | 11,31 | 102     | 51      | 5  |
| 14,00   | 15,57 | 107     | 54      | 4  |
| 15,00   | 20,28 | 111     | 56      | 4  |
| 16,00   | 24,44 | 115     | 58      | 1  |
| 17,00   | 28,73 | 119     | 60      | 1  |
| 18,00   | 32,00 | 123     | 62      | 1  |
| 19,00   | 35,67 | 127     | 64      | 1  |
| 20,00   | 42,77 | 131     | 66      | 1  |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

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## HSS DIN 1897 N

| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     |        |        |        |      |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 |        |        |        |      |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €    | L<br>mm | l<br>mm |    |
|---------|------|---------|---------|----|
| 2,00    | 2,35 | 38      | 9       | 10 |
| 2,25    | 2,35 | 40      | 9       | 10 |
| 2,50    | 2,35 | 43      | 10      | 10 |
| 2,75    | 2,35 | 46      | 10      | 10 |
| 3,00    | 2,04 | 46      | 10      | 10 |
| 3,25    | 2,04 | 49      | 10      | 10 |
| 3,30    | 2,04 | 49      | 10      | 10 |
| 3,50    | 2,27 | 52      | 13      | 10 |
| 3,75    | 2,60 | 52      | 13      | 10 |
| 4,00    | 2,34 | 55      | 13      | 10 |
| 4,10    | 2,52 | 55      | 13      | 10 |
| 4,20    | 2,52 | 55      | 13      | 10 |

| Ø<br>mm | €    | L<br>mm | l<br>mm |    |
|---------|------|---------|---------|----|
| 4,25    | 2,52 | 55      | 13      | 10 |
| 4,50    | 2,60 | 58      | 13      | 10 |
| 4,75    | 4,21 | 58      | 13      | 10 |
| 4,80    | 2,87 | 58      | 13      | 10 |
| 5,00    | 2,98 | 62      | 13      | 10 |
| 5,25    | 4,21 | 62      | 13      | 10 |
| 5,50    | 3,59 | 66      | 16      | 10 |
| 5,75    | 4,97 | 66      | 16      | 10 |
| 6,00    | 4,02 | 66      | 16      | 10 |
| 7,00    | 5,31 | 74      | 19      | 10 |
| 8,00    | 6,51 | 79      | 19      | 10 |

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## HSSCO DIN 1897 N

| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        | ○    |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 | 12-20  | 6-16   |        | 8-14 |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €    | L<br>mm | l<br>mm |    |
|---------|------|---------|---------|----|
| 2,00    | 1,42 | 38      | 12      | 10 |
| 2,20    | 2,48 | 40      | 13      | 10 |
| 2,25    | 1,94 | 40      | 13      | 10 |
| 2,50    | 2,03 | 43      | 14      | 10 |
| 2,70    | 3,42 | 46      | 16      | 10 |
| 2,75    | 2,14 | 46      | 16      | 10 |
| 3,00    | 2,14 | 46      | 16      | 10 |
| 3,20    | 2,71 | 49      | 18      | 10 |
| 3,25    | 2,10 | 49      | 18      | 10 |
| 3,30    | 2,80 | 49      | 18      | 10 |
| 3,50    | 2,27 | 52      | 20      | 10 |
| 3,75    | 2,38 | 52      | 20      | 10 |
| 4,00    | 2,50 | 55      | 22      | 10 |
| 4,10    | 4,56 | 55      | 22      | 10 |
| 4,20    | 3,45 | 55      | 22      | 10 |
| 4,25    | 2,71 | 55      | 22      | 10 |
| 4,50    | 2,88 | 58      | 24      | 10 |
| 4,75    | 2,98 | 58      | 24      | 10 |
| 4,90    | 3,61 | 62      | 26      | 10 |
| 5,00    | 3,22 | 62      | 26      | 10 |
| 5,10    | 4,03 | 62      | 26      | 10 |

| Ø<br>mm | €     | L<br>mm | l<br>mm |    |
|---------|-------|---------|---------|----|
| 5,20    | 3,92  | 62      | 26      | 10 |
| 5,25    | 3,07  | 62      | 26      | 10 |
| 5,50    | 3,36  | 66      | 28      | 10 |
| 5,75    | 3,48  | 66      | 28      | 10 |
| 6,00    | 3,62  | 66      | 28      | 10 |
| 6,50    | 4,14  | 70      | 31      | 10 |
| 6,75    | 7,07  | 74      | 34      | 10 |
| 7,00    | 4,64  | 74      | 34      | 10 |
| 7,50    | 5,89  | 74      | 34      | 10 |
| 8,00    | 6,54  | 79      | 37      | 10 |
| 8,25    | 8,33  | 79      | 37      | 10 |
| 8,50    | 7,07  | 79      | 37      | 10 |
| 9,00    | 7,84  | 84      | 40      | 10 |
| 9,50    | 8,46  | 84      | 40      | 10 |
| 10,00   | 9,39  | 89      | 43      | 5  |
| 10,50   | 14,12 | 89      | 43      | 5  |
| 11,00   | 13,04 | 95      | 47      | 5  |
| 11,50   | 14,63 | 95      | 47      | 5  |
| 12,00   | 17,96 | 102     | 51      | 5  |
| 12,50   | 18,84 | 102     | 51      | 5  |
| 13,00   | 24,62 | 102     | 51      | 5  |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

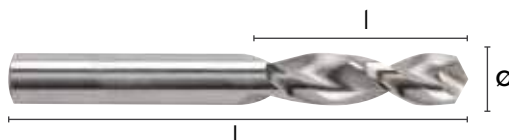
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**HSSCO DIN 1897 S**



| P     |        |        |        | M    |        | K    |      |        | N     |    |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|------|------|--------|-------|----|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500 | <800 | <1.400 | Al    | Cu | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        |      |        |      |      |        | ●     |    | ●     |         |    |    |        |        |        |
| 15-30 | 12-20  | 6-16   |        |      |        |      |      |        | 30-80 |    | 50-70 |         |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø mm | €    | L mm | l mm |    |
|------|------|------|------|----|
| 2,00 | 4,15 | 38   | 12   | 10 |
| 2,50 | 3,74 | 43   | 14   | 10 |
| 2,80 | 3,76 | 46   | 16   | 10 |
| 3,00 | 3,60 | 46   | 16   | 10 |
| 3,10 | 4,00 | 49   | 18   | 10 |
| 3,20 | 4,00 | 49   | 18   | 10 |
| 3,30 | 4,00 | 49   | 18   | 10 |
| 3,40 | 4,00 | 52   | 20   | 10 |
| 3,50 | 4,00 | 52   | 20   | 10 |
| 3,60 | 4,87 | 52   | 20   | 10 |
| 3,70 | 4,87 | 52   | 20   | 10 |
| 3,80 | 5,07 | 55   | 22   | 10 |
| 3,90 | 4,87 | 55   | 22   | 10 |
| 4,00 | 4,43 | 55   | 22   | 10 |
| 4,10 | 5,27 | 55   | 22   | 10 |
| 4,20 | 5,27 | 55   | 22   | 10 |
| 4,30 | 6,07 | 58   | 24   | 10 |
| 4,40 | 6,07 | 58   | 24   | 10 |
| 4,50 | 5,27 | 58   | 24   | 10 |
| 4,60 | 6,31 | 58   | 24   | 10 |
| 4,70 | 6,33 | 58   | 24   | 10 |
| 4,80 | 6,33 | 62   | 26   | 10 |
| 4,90 | 6,31 | 62   | 26   | 10 |
| 5,00 | 5,87 | 62   | 26   | 10 |
| 5,10 | 7,18 | 62   | 26   | 10 |
| 5,20 | 7,18 | 62   | 26   | 10 |
| 5,30 | 7,18 | 62   | 26   | 10 |
| 5,40 | 7,17 | 66   | 28   | 10 |
| 5,50 | 6,55 | 66   | 28   | 10 |
| 5,60 | 7,56 | 66   | 28   | 10 |

| Ø mm  | €     | L mm | l mm |    |
|-------|-------|------|------|----|
| 5,70  | 7,87  | 66   | 28   | 10 |
| 5,80  | 7,56  | 66   | 28   | 10 |
| 5,90  | 7,56  | 66   | 28   | 10 |
| 6,00  | 7,46  | 66   | 28   | 10 |
| 6,10  | 9,59  | 66   | 28   | 10 |
| 6,20  | 9,56  | 70   | 31   | 10 |
| 6,50  | 8,92  | 70   | 31   | 10 |
| 6,80  | 12,43 | 70   | 31   | 10 |
| 7,00  | 10,22 | 74   | 34   | 10 |
| 7,20  | 12,96 | 74   | 34   | 10 |
| 7,50  | 13,19 | 74   | 34   | 10 |
| 7,80  | 13,19 | 74   | 34   | 10 |
| 8,00  | 12,85 | 79   | 37   | 10 |
| 8,20  | 11,35 | 79   | 37   | 10 |
| 8,50  | 15,24 | 79   | 37   | 10 |
| 8,80  | 22,30 | 79   | 37   | 10 |
| 9,00  | 16,62 | 84   | 40   | 10 |
| 9,20  | 18,73 | 84   | 40   | 10 |
| 9,50  | 18,73 | 84   | 40   | 10 |
| 9,80  | 20,81 | 84   | 40   | 10 |
| 10,00 | 20,81 | 89   | 43   | 10 |
| 10,50 | 22,63 | 89   | 43   | 5  |
| 11,00 | 25,94 | 89   | 43   | 5  |
| 11,50 | 28,81 | 95   | 47   | 5  |
| 12,00 | 30,36 | 95   | 47   | 5  |
| 13,00 | 37,40 | 102  | 51   | 5  |
| 14,00 | 48,20 | 102  | 51   | 5  |
| 15,00 | 53,37 | 107  | 54   | 4  |
| 16,00 | 61,97 | 111  | 56   | 4  |

# BROCAS CON MANGO CILÍNDRICO FORETS À QUEUE CYLINDRIQUE / STRAIGHT SHANK DRILL-BITS

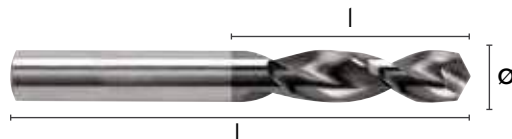
1167

**HSSCO DIN 1897 S**



| P     |        |        |        | M     |        | K    |      |        | N      |    |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|-------|--------|------|------|--------|--------|----|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500 | <800 | <1.400 | Al     | Cu | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        | ○     |        |      |      |        | ●      |    | ●     |         |    |    |        |        |        |
| 25-45 | 18-30  | 10-25  |        | 12-20 |        |      |      |        | 45-100 |    | 70-90 |         |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø mm | €     | L mm | l mm |   |
|------|-------|------|------|---|
| 2,00 | 5,82  | 38   | 12   | 1 |
| 2,50 | 5,26  | 43   | 14   | 1 |
| 2,80 | 5,26  | 46   | 16   | 1 |
| 3,00 | 5,04  | 46   | 16   | 1 |
| 3,10 | 5,60  | 49   | 18   | 1 |
| 3,20 | 5,60  | 49   | 18   | 1 |
| 3,30 | 5,60  | 49   | 18   | 1 |
| 3,40 | 5,60  | 52   | 20   | 1 |
| 3,50 | 5,60  | 52   | 20   | 1 |
| 3,60 | 6,83  | 52   | 20   | 1 |
| 3,70 | 6,83  | 52   | 20   | 1 |
| 3,80 | 7,10  | 55   | 22   | 1 |
| 3,90 | 6,83  | 55   | 22   | 1 |
| 4,00 | 6,22  | 55   | 22   | 1 |
| 4,10 | 7,36  | 55   | 22   | 1 |
| 4,20 | 7,36  | 55   | 22   | 1 |
| 4,30 | 8,50  | 58   | 24   | 1 |
| 4,40 | 8,50  | 58   | 24   | 1 |
| 4,50 | 7,36  | 58   | 24   | 1 |
| 4,60 | 8,86  | 58   | 24   | 1 |
| 4,70 | 8,87  | 58   | 24   | 1 |
| 4,80 | 8,87  | 62   | 26   | 1 |
| 4,90 | 8,86  | 62   | 26   | 1 |
| 5,00 | 8,24  | 62   | 26   | 1 |
| 5,10 | 10,03 | 62   | 26   | 1 |
| 5,20 | 10,03 | 62   | 26   | 1 |
| 5,30 | 10,03 | 62   | 26   | 1 |
| 5,40 | 10,03 | 66   | 28   | 1 |
| 5,50 | 9,17  | 66   | 28   | 1 |
| 5,60 | 10,59 | 66   | 28   | 1 |

| Ø mm  | €     | L mm | l mm |   |
|-------|-------|------|------|---|
| 5,70  | 11,01 | 66   | 28   | 1 |
| 5,80  | 10,59 | 66   | 28   | 1 |
| 5,90  | 10,59 | 66   | 28   | 1 |
| 6,00  | 10,44 | 66   | 28   | 1 |
| 6,10  | 13,41 | 70   | 31   | 1 |
| 6,20  | 13,40 | 70   | 31   | 1 |
| 6,50  | 12,46 | 70   | 31   | 1 |
| 6,80  | 17,40 | 74   | 34   | 1 |
| 7,00  | 14,32 | 74   | 34   | 1 |
| 7,20  | 18,16 | 74   | 34   | 1 |
| 7,50  | 18,47 | 74   | 34   | 1 |
| 7,80  | 18,48 | 79   | 37   | 1 |
| 8,00  | 17,99 | 79   | 37   | 1 |
| 8,20  | 15,90 | 79   | 37   | 1 |
| 8,50  | 21,33 | 79   | 37   | 1 |
| 8,80  | 31,21 | 84   | 40   | 1 |
| 9,00  | 23,27 | 84   | 40   | 1 |
| 9,20  | 26,22 | 84   | 40   | 1 |
| 9,50  | 26,22 | 84   | 40   | 1 |
| 9,80  | 29,13 | 89   | 43   | 1 |
| 10,00 | 29,13 | 89   | 43   | 1 |
| 10,50 | 31,68 | 89   | 43   | 1 |
| 11,00 | 36,32 | 95   | 47   | 1 |
| 11,50 | 40,33 | 95   | 47   | 1 |
| 12,00 | 42,53 | 102  | 51   | 1 |
| 13,00 | 52,36 | 102  | 51   | 1 |
| 14,00 | 67,47 | 107  | 54   | 1 |
| 15,00 | 74,70 | 111  | 56   | 1 |
| 16,00 | 86,77 | 115  | 58   | 1 |

# BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

1121

HSS DIN 345 N



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     |        |        |        |      |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 |        |        |        |      |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| △ | Ø mm  | €     | L mm | l mm | 📦 |
|---|-------|-------|------|------|---|
| 1 | 5,00  | 18,12 | 133  | 52   | 1 |
| 1 | 5,25  | 20,87 | 133  | 52   | 1 |
| 1 | 5,50  | 18,12 | 138  | 57   | 1 |
| 1 | 5,75  | 20,87 | 138  | 57   | 1 |
| 1 | 6,00  | 18,12 | 138  | 57   | 1 |
| 1 | 6,25  | 23,77 | 144  | 63   | 1 |
| 1 | 6,50  | 20,64 | 144  | 63   | 1 |
| 1 | 6,75  | 23,77 | 150  | 69   | 1 |
| 1 | 7,00  | 20,64 | 150  | 69   | 1 |
| 1 | 7,25  | 25,52 | 150  | 69   | 1 |
| 1 | 7,50  | 22,20 | 150  | 69   | 1 |
| 1 | 7,75  | 25,52 | 156  | 75   | 1 |
| 1 | 8,00  | 22,20 | 156  | 75   | 1 |
| 1 | 8,25  | 29,95 | 156  | 75   | 1 |
| 1 | 8,50  | 20,03 | 156  | 75   | 1 |
| 1 | 8,75  | 29,95 | 162  | 81   | 1 |
| 1 | 9,00  | 20,03 | 162  | 81   | 1 |
| 1 | 9,25  | 30,94 | 162  | 81   | 1 |
| 1 | 9,50  | 19,78 | 162  | 81   | 1 |
| 1 | 9,75  | 30,94 | 168  | 87   | 1 |
| 1 | 10,00 | 19,78 | 168  | 87   | 1 |
| 1 | 10,25 | 31,58 | 168  | 87   | 1 |
| 1 | 10,50 | 21,12 | 168  | 87   | 1 |
| 1 | 10,75 | 31,58 | 175  | 94   | 1 |
| 1 | 11,00 | 21,12 | 175  | 94   | 1 |
| 1 | 11,25 | 33,26 | 175  | 94   | 1 |
| 1 | 11,50 | 22,26 | 175  | 94   | 1 |
| 1 | 11,75 | 33,26 | 175  | 94   | 1 |
| 1 | 12,00 | 22,26 | 182  | 101  | 1 |
| 1 | 12,25 | 37,05 | 182  | 101  | 1 |
| 1 | 12,50 | 24,77 | 182  | 101  | 1 |
| 1 | 12,75 | 37,05 | 182  | 101  | 1 |
| 1 | 13,00 | 24,77 | 182  | 101  | 1 |
| 1 | 13,25 | 40,73 | 189  | 108  | 1 |
| 1 | 13,50 | 27,24 | 189  | 108  | 1 |
| 1 | 13,75 | 40,73 | 189  | 108  | 1 |
| 1 | 14,00 | 27,24 | 189  | 108  | 1 |
| 2 | 14,25 | 44,07 | 212  | 114  | 1 |
| 2 | 14,50 | 29,49 | 212  | 114  | 1 |
| 2 | 14,75 | 44,07 | 212  | 114  | 1 |
| 2 | 15,00 | 29,49 | 212  | 114  | 1 |
| 2 | 15,25 | 45,66 | 218  | 120  | 1 |
| 2 | 15,50 | 30,51 | 218  | 120  | 1 |
| 2 | 15,75 | 45,66 | 218  | 120  | 1 |
| 2 | 16,00 | 30,51 | 218  | 120  | 1 |
| 2 | 16,25 | 51,61 | 223  | 125  | 1 |
| 2 | 16,50 | 34,52 | 223  | 125  | 1 |
| 2 | 16,75 | 51,61 | 223  | 125  | 1 |
| 2 | 17,00 | 34,52 | 223  | 125  | 1 |
| 2 | 17,25 | 57,14 | 228  | 130  | 1 |
| 2 | 17,50 | 38,20 | 228  | 130  | 1 |

| △ | Ø mm  | €      | L mm | l mm | 📦 |
|---|-------|--------|------|------|---|
| 2 | 17,75 | 57,14  | 228  | 130  | 1 |
| 2 | 18,00 | 38,20  | 228  | 130  | 1 |
| 2 | 18,25 | 62,87  | 233  | 135  | 1 |
| 2 | 18,50 | 42,05  | 233  | 135  | 1 |
| 2 | 18,75 | 62,87  | 233  | 135  | 1 |
| 2 | 19,00 | 42,05  | 233  | 135  | 1 |
| 2 | 19,25 | 68,45  | 238  | 140  | 1 |
| 2 | 19,50 | 45,76  | 238  | 140  | 1 |
| 2 | 19,75 | 68,45  | 238  | 140  | 1 |
| 2 | 20,00 | 45,76  | 238  | 140  | 1 |
| 2 | 20,25 | 70,94  | 243  | 145  | 1 |
| 2 | 20,50 | 49,46  | 243  | 145  | 1 |
| 2 | 20,75 | 70,94  | 243  | 145  | 1 |
| 2 | 21,00 | 49,46  | 243  | 145  | 1 |
| 2 | 21,25 | 78,24  | 248  | 150  | 1 |
| 2 | 21,50 | 54,60  | 248  | 150  | 1 |
| 2 | 21,75 | 78,24  | 248  | 150  | 1 |
| 2 | 22,00 | 54,60  | 248  | 150  | 1 |
| 2 | 22,25 | 86,64  | 248  | 150  | 1 |
| 2 | 22,50 | 59,73  | 253  | 155  | 1 |
| 2 | 22,75 | 85,64  | 253  | 155  | 1 |
| 2 | 23,00 | 59,73  | 253  | 155  | 1 |
| 3 | 23,25 | 94,45  | 276  | 155  | 1 |
| 3 | 23,50 | 65,92  | 276  | 155  | 1 |
| 3 | 23,75 | 94,45  | 281  | 160  | 1 |
| 3 | 24,00 | 65,92  | 281  | 160  | 1 |
| 3 | 24,25 | 103,03 | 281  | 160  | 1 |
| 3 | 24,50 | 71,86  | 281  | 160  | 1 |
| 3 | 24,75 | 103,03 | 281  | 160  | 1 |
| 3 | 25,00 | 71,86  | 281  | 160  | 1 |
| 3 | 25,25 | 112,09 | 286  | 165  | 1 |
| 3 | 25,50 | 78,20  | 286  | 165  | 1 |
| 3 | 25,75 | 112,09 | 286  | 165  | 1 |
| 3 | 26,00 | 78,20  | 286  | 165  | 1 |
| 3 | 26,25 | 121,39 | 286  | 165  | 1 |
| 3 | 26,50 | 84,68  | 286  | 165  | 1 |
| 3 | 26,75 | 121,39 | 291  | 170  | 1 |
| 3 | 27,00 | 86,94  | 291  | 170  | 1 |
| 3 | 27,25 | 129,92 | 291  | 170  | 1 |
| 3 | 27,50 | 90,67  | 291  | 170  | 1 |
| 3 | 27,75 | 129,92 | 291  | 170  | 1 |
| 3 | 28,00 | 90,67  | 291  | 170  | 1 |
| 3 | 28,25 | 139,35 | 296  | 175  | 1 |
| 3 | 28,50 | 97,21  | 296  | 175  | 1 |
| 3 | 28,75 | 139,35 | 296  | 175  | 1 |
| 3 | 29,00 | 97,21  | 296  | 175  | 1 |
| 3 | 29,25 | 153,22 | 296  | 175  | 1 |
| 3 | 29,50 | 106,73 | 296  | 175  | 1 |
| 3 | 29,75 | 153,22 | 296  | 175  | 1 |
| 3 | 30,00 | 106,89 | 296  | 175  | 1 |
| 3 | 30,25 | 170,49 | 301  | 180  | 1 |

(continúa Ref.1121 / suite Réf.1121 / Ref.1121 cont'd)

# BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

(continúa Ref.1121 / suite Réf.1121 / Ref.1121 cont'd)

|   |  | Ø<br>mm | €      | L<br>mm | l<br>mm |  |
|---|-----------------------------------------------------------------------------------|---------|--------|---------|---------|-----------------------------------------------------------------------------------|
| 3 |                                                                                   | 30,50   | 148,26 | 301     | 180     | 1                                                                                 |
| 3 |                                                                                   | 30,75   | 170,49 | 301     | 180     | 1                                                                                 |
| 3 |                                                                                   | 31,00   | 118,97 | 301     | 180     | 1                                                                                 |
| 3 |                                                                                   | 31,25   | 180,57 | 301     | 180     | 1                                                                                 |
| 3 |                                                                                   | 31,50   | 148,34 | 301     | 180     | 1                                                                                 |
| 3 |                                                                                   | 31,75   | 180,57 | 306     | 185     | 1                                                                                 |
| 4 |                                                                                   | 32,00   | 125,97 | 334     | 185     | 1                                                                                 |
| 4 |                                                                                   | 32,50   | 179,30 | 334     | 185     | 1                                                                                 |
| 4 |                                                                                   | 33,00   | 143,86 | 334     | 185     | 1                                                                                 |
| 4 |                                                                                   | 33,50   | 194,96 | 334     | 185     | 1                                                                                 |
| 4 |                                                                                   | 34,00   | 156,47 | 339     | 190     | 1                                                                                 |
| 4 |                                                                                   | 34,50   | 213,08 | 339     | 190     | 1                                                                                 |
| 4 |                                                                                   | 35,00   | 171,00 | 339     | 190     | 1                                                                                 |
| 4 |                                                                                   | 35,50   | 228,65 | 339     | 190     | 1                                                                                 |
| 4 |                                                                                   | 36,00   | 183,41 | 344     | 195     | 1                                                                                 |
| 4 |                                                                                   | 36,50   | 241,02 | 344     | 195     | 1                                                                                 |
| 4 |                                                                                   | 37,00   | 193,37 | 344     | 195     | 1                                                                                 |
| 4 |                                                                                   | 37,50   | 253,52 | 344     | 195     | 1                                                                                 |
| 4 |                                                                                   | 38,00   | 203,44 | 349     | 200     | 1                                                                                 |
| 4 |                                                                                   | 38,50   | 270,33 | 349     | 200     | 1                                                                                 |
| 4 |                                                                                   | 39,00   | 216,93 | 349     | 200     | 1                                                                                 |
| 4 |                                                                                   | 39,50   | 285,48 | 349     | 200     | 1                                                                                 |
| 4 |                                                                                   | 40,00   | 229,06 | 349     | 200     | 1                                                                                 |
| 4 |                                                                                   | 40,50   | 300,14 | 354     | 205     | 1                                                                                 |
| 4 |                                                                                   | 41,00   | 240,83 | 354     | 205     | 1                                                                                 |
| 4 |                                                                                   | 41,50   | 318,53 | 354     | 205     | 1                                                                                 |
| 4 |                                                                                   | 42,00   | 255,55 | 354     | 205     | 1                                                                                 |
| 4 |                                                                                   | 42,50   | 334,05 | 354     | 205     | 1                                                                                 |
| 4 |                                                                                   | 43,00   | 268,04 | 359     | 210     | 1                                                                                 |
| 4 |                                                                                   | 43,50   | 349,77 | 359     | 210     | 1                                                                                 |
| 4 |                                                                                   | 44,00   | 280,61 | 359     | 210     | 1                                                                                 |
| 4 |                                                                                   | 44,50   | 365,17 | 359     | 210     | 1                                                                                 |
| 4 |                                                                                   | 45,00   | 291,43 | 359     | 210     | 1                                                                                 |
| 4 |                                                                                   | 45,50   | 380,61 | 364     | 215     | 1                                                                                 |
| 4 |                                                                                   | 46,00   | 305,36 | 364     | 215     | 1                                                                                 |
| 4 |                                                                                   | 46,50   | 396,10 | 364     | 215     | 1                                                                                 |
| 4 |                                                                                   | 47,00   | 317,84 | 364     | 215     | 1                                                                                 |
| 4 |                                                                                   | 47,50   | 409,42 | 364     | 215     | 1                                                                                 |
| 4 |                                                                                   | 48,00   | 328,50 | 369     | 220     | 1                                                                                 |
| 4 |                                                                                   | 48,50   | 425,13 | 369     | 220     | 1                                                                                 |
| 4 |                                                                                   | 49,00   | 341,11 | 369     | 220     | 1                                                                                 |
| 4 |                                                                                   | 49,50   | 440,61 | 369     | 220     | 1                                                                                 |

|   |  | Ø<br>mm | €        | L<br>mm | l<br>mm |  |
|---|-----------------------------------------------------------------------------------|---------|----------|---------|---------|-------------------------------------------------------------------------------------|
| 4 |                                                                                   | 50,00   | 344,06   | 369     | 220     | 1                                                                                   |
| 5 |                                                                                   | 51,00   | 447,16   | 412     | 225     | 1                                                                                   |
| 5 |                                                                                   | 52,00   | 474,66   | 412     | 225     | 1                                                                                   |
| 5 |                                                                                   | 53,00   | 514,19   | 412     | 225     | 1                                                                                   |
| 5 |                                                                                   | 54,00   | 528,16   | 417     | 230     | 1                                                                                   |
| 5 |                                                                                   | 55,00   | 529,34   | 417     | 230     | 1                                                                                   |
| 5 |                                                                                   | 56,00   | 623,74   | 417     | 230     | 1                                                                                   |
| 5 |                                                                                   | 57,00   | 665,87   | 422     | 235     | 1                                                                                   |
| 5 |                                                                                   | 58,00   | 665,87   | 422     | 235     | 1                                                                                   |
| 5 |                                                                                   | 59,00   | 681,05   | 422     | 235     | 1                                                                                   |
| 5 |                                                                                   | 60,00   | 655,19   | 422     | 235     | 1                                                                                   |
| 5 |                                                                                   | 61,00   | 729,87   | 427     | 240     | 1                                                                                   |
| 5 |                                                                                   | 62,00   | 746,89   | 427     | 240     | 1                                                                                   |
| 5 |                                                                                   | 63,00   | 802,44   | 427     | 240     | 1                                                                                   |
| 5 |                                                                                   | 64,00   | 836,14   | 432     | 245     | 1                                                                                   |
| 5 |                                                                                   | 65,00   | 799,89   | 432     | 245     | 1                                                                                   |
| 5 |                                                                                   | 66,00   | 911,49   | 432     | 245     | 1                                                                                   |
| 5 |                                                                                   | 67,00   | 938,47   | 432     | 245     | 1                                                                                   |
| 5 |                                                                                   | 68,00   | 967,40   | 437     | 250     | 1                                                                                   |
| 5 |                                                                                   | 69,00   | 992,52   | 437     | 250     | 1                                                                                   |
| 5 |                                                                                   | 70,00   | 1.023,37 | 437     | 250     | 1                                                                                   |
| 5 |                                                                                   | 71,00   | 970,28   | 437     | 250     | 1                                                                                   |
| 5 |                                                                                   | 72,00   | 1.120,29 | 442     | 255     | 1                                                                                   |
| 5 |                                                                                   | 73,00   | 1.143,46 | 442     | 255     | 1                                                                                   |
| 5 |                                                                                   | 74,00   | 1.173,40 | 442     | 255     | 1                                                                                   |
| 5 |                                                                                   | 75,00   | 1.207,72 | 442     | 255     | 1                                                                                   |
| 5 |                                                                                   | 76,00   | 1.137,63 | 447     | 260     | 1                                                                                   |
| 6 |                                                                                   | 77,00   | 1.339,58 | 514     | 260     | 1                                                                                   |
| 6 |                                                                                   | 78,00   | 1.437,56 | 514     | 260     | 1                                                                                   |
| 6 |                                                                                   | 79,00   | 1.465,62 | 514     | 260     | 1                                                                                   |
| 6 |                                                                                   | 80,00   | 1.495,14 | 514     | 260     | 1                                                                                   |

# BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

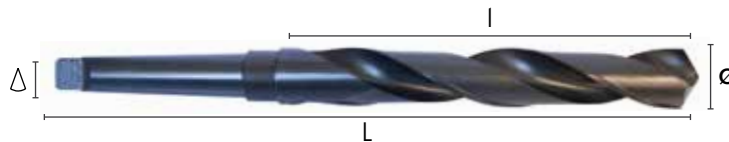
1121/9

HSS DIN 345 N



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     |        |        |        |      |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 |        |        |        |      |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 1/2"    | 24,77 | 182     | 101     | 1 |
| 33/64"  | 24,77 | 182     | 101     | 1 |
| 17/32"  | 27,24 | 189     | 108     | 1 |
| 35/64"  | 27,24 | 189     | 108     | 1 |
| 9/16"   | 29,49 | 212     | 114     | 1 |
| 37/64"  | 44,07 | 212     | 114     | 1 |
| 19/32"  | 29,49 | 218     | 120     | 1 |
| 39/64"  | 30,51 | 218     | 120     | 1 |
| 5/8"    | 30,51 | 218     | 120     | 1 |
| 41/64"  | 51,61 | 223     | 125     | 1 |
| 21/32"  | 34,52 | 223     | 125     | 1 |
| 43/64"  | 34,52 | 223     | 125     | 1 |
| 11/16"  | 38,20 | 228     | 130     | 1 |
| 45/64"  | 38,20 | 228     | 130     | 1 |
| 23/32"  | 62,87 | 233     | 135     | 1 |
| 47/64"  | 42,05 | 233     | 135     | 1 |
| 3/4"    | 42,05 | 238     | 140     | 1 |
| 49/64"  | 45,76 | 238     | 140     | 1 |
| 25/32"  | 68,45 | 238     | 140     | 1 |
| 51/64"  | 45,76 | 243     | 145     | 1 |
| 13/16"  | 49,46 | 243     | 145     | 1 |
| 53/64"  | 49,46 | 243     | 145     | 1 |
| 27/32"  | 54,60 | 248     | 150     | 1 |
| 55/64"  | 78,24 | 248     | 150     | 1 |
| 7/8"    | 54,60 | 248     | 150     | 1 |
| 57/64"  | 59,73 | 253     | 155     | 1 |

| Ø<br>mm  | €      | L<br>mm | l<br>mm |   |
|----------|--------|---------|---------|---|
| 29/32"   | 59,73  | 253     | 155     | 1 |
| 59/64"   | 65,92  | 276     | 155     | 1 |
| 15/16"   | 129,92 | 281     | 160     | 1 |
| 61/64"   | 65,92  | 281     | 160     | 1 |
| 31/32"   | 54,60  | 281     | 160     | 1 |
| 63/64"   | 71,86  | 286     | 160     | 1 |
| 1"       | 79,40  | 290     | 170     | 1 |
| 1-1/16"  | 86,94  | 291     | 170     | 1 |
| 1-1/8"   | 97,21  | 296     | 175     | 1 |
| 1-5/32"  | 97,21  | 296     | 175     | 1 |
| 1-3/16"  | 106,89 | 301     | 180     | 1 |
| 1-7/32"  | 118,97 | 301     | 180     | 1 |
| 1-1/4"   | 180,57 | 306     | 185     | 1 |
| 1-9/32"  | 179,30 | 334     | 185     | 1 |
| 1-5/16"  | 143,86 | 334     | 185     | 1 |
| 1-11/32" | 156,47 | 339     | 190     | 1 |
| 1-3/8"   | 171,00 | 339     | 190     | 1 |
| 1-13/32" | 183,41 | 344     | 195     | 1 |
| 1-7/16"  | 241,02 | 344     | 195     | 1 |
| 1-1/2"   | 203,44 | 349     | 200     | 1 |
| 1-9/16"  | 229,06 | 349     | 200     | 1 |
| 1-5/8"   | 240,83 | 354     | 205     | 1 |
| 1-11/16" | 268,04 | 359     | 210     | 1 |
| 1-3/4"   | 280,61 | 359     | 210     | 1 |
| 2"       | 344,06 | 374     | 225     | 1 |



1123

HSS DIN 345 N - WIDIA



| P     |        |        |        | M    |        | K    |       |        | N  |    |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|------|-------|--------|----|----|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500 | <800  | <1.400 | Al | Cu | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      | ○      |      |        |      | ●     | ●      |    |    |       | ○       |    |    |        |        |        |
| 25-45 | 18-30  | 10-25  | 6-9    |      |        |      | 30-40 | 15-20  |    |    |       | 30-35   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| △ | Ø<br>mm | €      | L<br>mm | I<br>mm | 📦 |
|---|---------|--------|---------|---------|---|
| 1 | 10,00   | 80,28  | 168     | 87      | 1 |
| 1 | 11,00   | 86,84  | 175     | 94      | 1 |
| 1 | 12,00   | 91,11  | 182     | 101     | 1 |
| 1 | 13,00   | 103,55 | 182     | 101     | 1 |
| 1 | 14,00   | 112,57 | 189     | 108     | 1 |
| 1 | 14,50   | 127,18 | 212     | 114     | 1 |
| 2 | 15,00   | 127,18 | 212     | 114     | 1 |
| 2 | 15,50   | 135,85 | 218     | 120     | 1 |
| 2 | 16,00   | 135,85 | 218     | 120     | 1 |
| 2 | 16,50   | 144,10 | 223     | 125     | 1 |
| 2 | 17,00   | 144,10 | 223     | 125     | 1 |
| 2 | 17,50   | 155,51 | 228     | 130     | 1 |
| 2 | 18,00   | 155,51 | 228     | 130     | 1 |
| 2 | 18,50   | 182,03 | 233     | 135     | 1 |
| 2 | 19,00   | 182,03 | 233     | 135     | 1 |

| △ | Ø<br>mm | €      | L<br>mm | I<br>mm | 📦 |
|---|---------|--------|---------|---------|---|
| 2 | 19,50   | 204,58 | 238     | 140     | 1 |
| 2 | 20,00   | 204,04 | 238     | 140     | 1 |
| 2 | 20,50   | 207,56 | 243     | 145     | 1 |
| 2 | 21,00   | 207,56 | 243     | 145     | 1 |
| 2 | 21,50   | 226,58 | 248     | 150     | 1 |
| 2 | 22,00   | 226,58 | 248     | 150     | 1 |
| 2 | 22,50   | 246,35 | 253     | 155     | 1 |
| 2 | 23,00   | 246,35 | 253     | 155     | 1 |
| 3 | 24,00   | 270,73 | 281     | 160     | 1 |
| 3 | 25,00   | 277,19 | 281     | 160     | 1 |
| 3 | 26,00   | 311,61 | 286     | 165     | 1 |
| 3 | 27,00   | 332,27 | 291     | 170     | 1 |
| 3 | 28,00   | 367,95 | 291     | 170     | 1 |
| 3 | 29,00   | 391,69 | 296     | 175     | 1 |
| 3 | 30,00   | 416,76 | 296     | 175     | 1 |

# BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

1122

**HSSCO DIN 345 N**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        | ○    |        | ●     | ●     |        | ○     | ●     |       | ●       |    |    |        |        |        |
| 15-35 | 12-20  | 6-16   |        | 8-14 |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 15-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



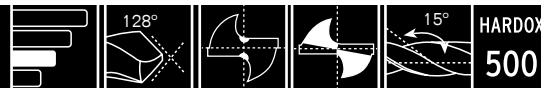
| △ | Ø<br>mm | €      | L<br>mm | l<br>mm | 📦 |
|---|---------|--------|---------|---------|---|
| 1 | 10,00   | 66,73  | 168     | 87      | 1 |
| 1 | 10,50   | 69,54  | 168     | 87      | 1 |
| 1 | 11,00   | 66,68  | 175     | 94      | 1 |
| 1 | 11,50   | 69,54  | 175     | 94      | 1 |
| 1 | 12,00   | 71,32  | 182     | 101     | 1 |
| 1 | 12,50   | 75,47  | 182     | 101     | 1 |
| 1 | 13,00   | 73,24  | 182     | 101     | 1 |
| 1 | 13,50   | 95,72  | 189     | 108     | 1 |
| 1 | 14,00   | 93,89  | 189     | 108     | 1 |
| 2 | 14,50   | 104,20 | 212     | 114     | 1 |
| 2 | 15,00   | 95,72  | 212     | 114     | 1 |
| 2 | 15,50   | 106,05 | 218     | 120     | 1 |
| 2 | 16,00   | 102,33 | 218     | 120     | 1 |
| 2 | 16,50   | 106,98 | 223     | 125     | 1 |
| 2 | 17,00   | 106,05 | 223     | 125     | 1 |
| 2 | 17,50   | 112,68 | 228     | 130     | 1 |
| 2 | 18,00   | 110,79 | 228     | 130     | 1 |
| 2 | 18,50   | 121,09 | 233     | 135     | 1 |
| 2 | 19,00   | 118,30 | 233     | 135     | 1 |
| 2 | 19,50   | 136,16 | 238     | 140     | 1 |
| 2 | 20,00   | 132,36 | 238     | 140     | 1 |
| 2 | 20,50   | 152,09 | 243     | 145     | 1 |
| 2 | 21,00   | 153,95 | 243     | 145     | 1 |
| 2 | 21,50   | 173,73 | 248     | 150     | 1 |
| 2 | 22,00   | 156,68 | 248     | 150     | 1 |
| 2 | 22,50   | 193,39 | 253     | 155     | 1 |

| △ | Ø<br>mm | €      | L<br>mm | l<br>mm | 📦 |
|---|---------|--------|---------|---------|---|
| 2 | 23,00   | 182,22 | 253     | 155     | 1 |
| 3 | 23,50   | 193,39 | 276     | 155     | 1 |
| 3 | 24,00   | 195,26 | 281     | 160     | 1 |
| 3 | 24,50   | 208,45 | 281     | 160     | 1 |
| 3 | 25,00   | 206,25 | 281     | 160     | 1 |
| 3 | 25,50   | 255,45 | 286     | 165     | 1 |
| 3 | 26,00   | 242,07 | 286     | 165     | 1 |
| 3 | 26,50   | 268,50 | 286     | 165     | 1 |
| 3 | 27,00   | 268,50 | 291     | 170     | 1 |
| 3 | 27,50   | 321,07 | 291     | 170     | 1 |
| 3 | 28,00   | 297,05 | 291     | 170     | 1 |
| 3 | 28,50   | 328,61 | 296     | 175     | 1 |
| 3 | 29,00   | 303,66 | 296     | 175     | 1 |
| 3 | 29,50   | 336,14 | 296     | 175     | 1 |
| 3 | 30,00   | 310,10 | 296     | 175     | 1 |
| 3 | 31,00   | 310,09 | 301     | 180     | 1 |
| 4 | 32,00   | 355,34 | 334     | 185     | 1 |
| 4 | 33,00   | 405,85 | 334     | 185     | 1 |
| 4 | 34,00   | 482,25 | 339     | 190     | 1 |
| 4 | 35,00   | 482,25 | 339     | 190     | 1 |
| 4 | 36,00   | 517,45 | 344     | 195     | 1 |
| 4 | 37,00   | 534,81 | 344     | 195     | 1 |
| 4 | 38,00   | 595,70 | 349     | 200     | 1 |
| 4 | 39,00   | 611,84 | 349     | 200     | 1 |
| 4 | 40,00   | 646,16 | 349     | 200     | 1 |

# BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

1181

**HSSCO (8%)**



| P    |        |        |        | M    |        | K    |      |        | N  |    |       |         | S     |    | H      |        |        |
|------|--------|--------|--------|------|--------|------|------|--------|----|----|-------|---------|-------|----|--------|--------|--------|
| <800 | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500 | <800 | <1.400 | Al | Cu | Mg/Zn | Plastic | Ni    | Ti | 50 HRC | 55 HRC | 60 HRC |
|      |        | ● 8-10 | ● 6-8  |      |        |      |      |        |    |    |       |         | ● 4-7 |    | ● 4-6  |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| △ | Ø<br>mm | €      | L<br>mm | I<br>mm | Icon |
|---|---------|--------|---------|---------|------|
| 2 | 10      | 55,94  | 190     | 90      | 1    |
| 2 | 11      | 55,94  | 190     | 90      | 1    |
| 2 | 12      | 61,27  | 190     | 90      | 1    |
| 2 | 13      | 61,27  | 190     | 90      | 1    |
| 2 | 14      | 65,23  | 190     | 90      | 1    |
| 2 | 15      | 66,51  | 190     | 90      | 1    |
| 2 | 16      | 79,13  | 190     | 90      | 1    |
| 2 | 17      | 84,36  | 190     | 90      | 1    |
| 2 | 18      | 85,63  | 190     | 90      | 1    |
| 3 | 19      | 97,29  | 225     | 105     | 1    |
| 3 | 20      | 103,44 | 225     | 105     | 1    |
| 3 | 21      | 112,64 | 225     | 105     | 1    |
| 3 | 22      | 129,50 | 225     | 105     | 1    |

| △ | Ø<br>mm | €      | L<br>mm | I<br>mm | Icon |
|---|---------|--------|---------|---------|------|
| 3 | 24      | 139,50 | 225     | 105     | 1    |
| 3 | 25      | 165,31 | 225     | 105     | 1    |
| 3 | 26      | 195,89 | 225     | 105     | 1    |
| 4 | 27      | 210,66 | 265     | 120     | 1    |
| 4 | 28      | 218,75 | 265     | 120     | 1    |
| 4 | 30      | 243,32 | 265     | 120     | 1    |
| 4 | 32      | 283,19 | 265     | 120     | 1    |
| 4 | 35      | 353,83 | 265     | 120     | 1    |
| 4 | 36      | 372,14 | 265     | 120     | 1    |
| 4 | 40      | 467,84 | 265     | 120     | 1    |
| 4 | 45      | 636,27 | 265     | 120     | 1    |
| 5 | 50      | 747,47 | 340     | 150     | 1    |

# BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

1125

HSS DIN 341 N



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     |        |        |        |      |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 |        |        |        |      |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| △ | Ø<br>mm | €     | L<br>mm | l<br>mm | 📦 |
|---|---------|-------|---------|---------|---|
| 1 | *5,00   | 25,25 | 155     | 74      | 1 |
| 1 | *5,50   | 34,14 | 161     | 80      | 1 |
| 1 | *6,00   | 26,94 | 161     | 80      | 1 |
| 1 | *6,50   | 28,40 | 167     | 86      | 1 |
| 1 | *7,00   | 30,02 | 174     | 93      | 1 |
| 1 | *7,50   | 31,33 | 174     | 93      | 1 |
| 1 | 8,00    | 31,62 | 181     | 100     | 1 |
| 1 | 8,50    | 31,62 | 181     | 100     | 1 |
| 1 | 9,00    | 34,62 | 188     | 107     | 1 |
| 1 | 9,50    | 38,61 | 188     | 107     | 1 |
| 1 | 10,00   | 37,49 | 197     | 116     | 1 |
| 1 | 10,50   | 37,71 | 197     | 116     | 1 |
| 1 | 11,00   | 36,83 | 206     | 125     | 1 |
| 1 | 11,50   | 36,83 | 206     | 125     | 1 |
| 1 | 12,00   | 39,21 | 215     | 134     | 1 |
| 1 | 12,50   | 40,73 | 215     | 134     | 1 |
| 1 | 13,00   | 40,73 | 215     | 134     | 1 |
| 1 | 13,50   | 42,59 | 223     | 142     | 1 |
| 1 | 14,00   | 46,25 | 223     | 142     | 1 |
| 1 | 14,50   | 58,20 | 245     | 147     | 1 |
| 2 | 15,00   | 58,20 | 245     | 147     | 1 |
| 2 | 15,50   | 59,52 | 251     | 153     | 1 |
| 2 | 16,00   | 60,49 | 251     | 153     | 1 |
| 2 | 16,50   | 63,92 | 257     | 159     | 1 |
| 2 | 17,00   | 64,26 | 257     | 159     | 1 |
| 2 | 17,50   | 62,72 | 263     | 165     | 1 |
| 2 | 18,00   | 69,70 | 263     | 165     | 1 |
| 2 | 18,50   | 71,61 | 269     | 171     | 1 |
| 2 | 19,00   | 73,88 | 269     | 171     | 1 |
| 2 | 19,50   | 77,56 | 275     | 177     | 1 |
| 2 | 20,00   | 78,51 | 275     | 177     | 1 |

| △ | Ø<br>mm | €      | L<br>mm | l<br>mm | 📦 |
|---|---------|--------|---------|---------|---|
| 2 | 20,50   | 90,00  | 282     | 184     | 1 |
| 2 | 21,00   | 87,24  | 282     | 184     | 1 |
| 2 | 21,50   | 106,20 | 289     | 191     | 1 |
| 2 | 22,00   | 101,36 | 289     | 191     | 1 |
| 2 | 22,50   | 110,47 | 296     | 198     | 1 |
| 2 | 23,00   | 105,29 | 296     | 198     | 1 |
| 3 | 23,50   | 131,00 | 319     | 198     | 1 |
| 3 | 24,00   | 129,02 | 327     | 206     | 1 |
| 3 | 24,50   | 137,01 | 327     | 206     | 1 |
| 3 | 25,00   | 131,31 | 327     | 206     | 1 |
| 3 | 25,50   | 155,70 | 335     | 214     | 1 |
| 3 | 26,00   | 146,94 | 335     | 214     | 1 |
| 3 | 26,50   | 160,60 | 335     | 214     | 1 |
| 3 | 27,00   | 156,36 | 343     | 222     | 1 |
| 3 | 27,50   | 189,18 | 343     | 222     | 1 |
| 3 | 28,00   | 171,77 | 343     | 222     | 1 |
| 3 | 28,50   | 224,72 | 351     | 230     | 1 |
| 3 | 29,00   | 183,47 | 351     | 230     | 1 |
| 3 | 29,50   | 224,72 | 351     | 230     | 1 |
| 3 | 30,00   | 206,76 | 351     | 230     | 1 |
| 3 | 31,00   | 237,05 | 360     | 239     | 1 |
| 4 | 32,00   | 245,77 | 397     | 248     | 1 |
| 4 | 33,00   | 274,94 | 397     | 248     | 1 |
| 4 | 34,00   | 320,09 | 406     | 257     | 1 |
| 4 | 35,00   | 316,93 | 406     | 257     | 1 |
| 4 | 36,00   | 367,11 | 416     | 267     | 1 |
| 4 | 37,00   | 381,42 | 416     | 267     | 1 |
| 4 | 38,00   | 408,53 | 426     | 277     | 1 |
| 4 | 39,00   | 414,89 | 426     | 277     | 1 |
| 4 | 40,00   | 448,72 | 426     | 277     | 1 |

\*(Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

# BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

1126

HSS DIN 1870 N



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     |        |        |        |      |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 |        |        |        |      |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| △ | Ø<br>mm | €      | L<br>mm | l<br>mm | 📦 |
|---|---------|--------|---------|---------|---|
| 1 | 8,00    | 79,35  | 265     | 165     | 1 |
| 1 | 8,00    | 98,91  | 330     | 210     | 1 |
| 1 | 8,50    | 87,10  | 265     | 165     | 1 |
| 1 | 8,50    | 101,08 | 330     | 210     | 1 |
| 1 | 9,00    | 89,68  | 275     | 175     | 1 |
| 1 | 9,00    | 114,03 | 345     | 220     | 1 |
| 1 | 9,50    | 96,00  | 275     | 175     | 1 |
| 1 | 9,50    | 115,22 | 345     | 220     | 1 |
| 1 | 10,00   | 98,63  | 285     | 185     | 1 |
| 1 | 10,00   | 121,61 | 360     | 235     | 1 |
| 1 | 10,50   | 104,73 | 285     | 185     | 1 |
| 1 | 10,50   | 125,36 | 360     | 235     | 1 |
| 1 | 11,00   | 109,32 | 300     | 195     | 1 |
| 1 | 11,00   | 149,49 | 375     | 250     | 1 |
| 1 | 11,50   | 119,71 | 300     | 195     | 1 |
| 1 | 11,50   | 149,49 | 375     | 250     | 1 |
| 1 | 12,00   | 122,50 | 310     | 205     | 1 |
| 1 | 12,00   | 152,65 | 395     | 260     | 1 |
| 1 | 12,50   | 130,38 | 310     | 205     | 1 |
| 1 | 12,50   | 170,39 | 395     | 260     | 1 |
| 1 | 13,00   | 130,38 | 310     | 205     | 1 |
| 1 | 13,00   | 170,39 | 395     | 260     | 1 |
| 1 | 13,50   | 142,76 | 325     | 220     | 1 |
| 1 | 13,50   | 174,98 | 410     | 275     | 1 |
| 1 | 14,00   | 142,76 | 325     | 220     | 1 |
| 1 | 14,00   | 174,98 | 410     | 275     | 1 |
| 2 | 14,50   | 156,37 | 340     | 220     | 1 |
| 2 | 14,50   | 190,58 | 425     | 275     | 1 |
| 2 | 15,00   | 156,37 | 340     | 220     | 1 |
| 2 | 15,00   | 190,58 | 425     | 275     | 1 |
| 2 | 15,50   | 175,30 | 355     | 230     | 1 |
| 2 | 15,50   | 210,22 | 445     | 295     | 1 |
| 2 | 16,00   | 175,30 | 355     | 230     | 1 |
| 2 | 16,00   | 210,22 | 445     | 295     | 1 |
| 2 | 16,50   | 188,91 | 355     | 230     | 1 |
| 2 | 16,50   | 227,14 | 445     | 295     | 1 |
| 2 | 17,00   | 188,91 | 355     | 230     | 1 |
| 2 | 17,00   | 227,14 | 445     | 295     | 1 |
| 2 | 17,50   | 207,86 | 370     | 245     | 1 |
| 2 | 17,50   | 250,12 | 465     | 310     | 1 |
| 2 | 18,00   | 207,86 | 370     | 245     | 1 |
| 2 | 18,00   | 250,12 | 465     | 310     | 1 |
| 2 | 18,50   | 225,34 | 370     | 245     | 1 |
| 2 | 18,50   | 270,28 | 465     | 310     | 1 |
| 2 | 19,00   | 225,34 | 370     | 245     | 1 |
| 2 | 19,00   | 270,28 | 465     | 310     | 1 |
| 2 | 19,50   | 240,65 | 385     | 260     | 1 |
| 2 | 19,50   | 292,51 | 490     | 325     | 1 |

| △ | Ø<br>mm | €      | L<br>mm | l<br>mm | 📦 |
|---|---------|--------|---------|---------|---|
| 2 | 20,00   | 240,65 | 385     | 260     | 1 |
| 2 | 20,00   | 292,51 | 490     | 325     | 1 |
| 2 | 20,50   | 272,56 | 385     | 260     | 1 |
| 2 | 20,50   | 327,30 | 490     | 325     | 1 |
| 2 | 21,00   | 272,56 | 385     | 260     | 1 |
| 2 | 21,00   | 327,30 | 490     | 325     | 1 |
| 2 | 21,50   | 290,65 | 405     | 270     | 1 |
| 2 | 21,50   | 351,28 | 515     | 345     | 1 |
| 2 | 22,00   | 290,65 | 405     | 270     | 1 |
| 2 | 22,00   | 351,28 | 515     | 345     | 1 |
| 2 | 22,50   | 331,25 | 405     | 270     | 1 |
| 2 | 22,50   | 396,51 | 515     | 345     | 1 |
| 2 | 23,00   | 331,25 | 405     | 270     | 1 |
| 2 | 23,00   | 396,51 | 515     | 345     | 1 |
| 3 | 23,50   | 363,95 | 425     | 270     | 1 |
| 3 | 23,50   | 441,29 | 535     | 345     | 1 |
| 3 | 24,00   | 363,95 | 440     | 290     | 1 |
| 3 | 24,00   | 441,29 | 555     | 365     | 1 |
| 3 | 24,50   | 377,18 | 440     | 290     | 1 |
| 3 | 24,50   | 465,09 | 555     | 365     | 1 |
| 3 | 25,00   | 377,18 | 440     | 290     | 1 |
| 3 | 25,00   | 465,09 | 555     | 365     | 1 |
| 3 | 25,50   | 389,85 | 440     | 290     | 1 |
| 3 | 25,50   | 513,75 | 555     | 365     | 1 |
| 3 | 26,00   | 389,85 | 440     | 290     | 1 |
| 3 | 26,00   | 513,75 | 555     | 365     | 1 |
| 3 | 26,50   | 399,22 | 440     | 290     | 1 |
| 3 | 26,50   | 530,09 | 555     | 365     | 1 |
| 3 | 27,00   | 399,22 | 460     | 305     | 1 |
| 3 | 27,00   | 530,09 | 580     | 385     | 1 |
| 3 | 27,50   | 425,90 | 460     | 305     | 1 |
| 3 | 27,50   | 573,46 | 580     | 385     | 1 |
| 3 | 28,00   | 425,90 | 460     | 305     | 1 |
| 3 | 28,00   | 573,46 | 580     | 385     | 1 |
| 3 | 28,50   | 441,29 | 460     | 305     | 1 |
| 3 | 28,50   | 632,74 | 580     | 385     | 1 |
| 3 | 29,00   | 441,29 | 460     | 305     | 1 |
| 3 | 29,00   | 632,74 | 580     | 385     | 1 |
| 3 | 29,50   | 456,89 | 460     | 305     | 1 |
| 3 | 29,50   | 637,95 | 580     | 385     | 1 |
| 3 | 30,00   | 456,89 | 460     | 305     | 1 |
| 3 | 30,00   | 637,95 | 580     | 385     | 1 |
| 3 | 31,00   | 512,15 | 480     | 320     | 1 |
| 3 | 31,00   | 680,17 | 610     | 410     | 1 |
| 4 | 32,00   | 535,50 | 505     | 320     | 1 |
| 4 | 32,00   | 713,62 | 635     | 410     | 1 |
| 4 | 33,00   | 583,51 | 505     | 320     | 1 |
| 4 | 33,00   | 790,04 | 635     | 410     | 1 |

(continúa Ref.1126 / suite Réf.1126 / Ref.1126 cont'd)

# BROCAS CON MANGO CÓNICO FORETS À QUEUE CONIQUE / TAPER SHANK DRILL-BITS

(continúa Ref.1126 / suite Réf.1126 / Ref.1126 cont'd)

|   |  | Ø<br>mm | €        | L<br>mm | l<br>mm |  |
|---|-----------------------------------------------------------------------------------|---------|----------|---------|---------|-----------------------------------------------------------------------------------|
| 4 |                                                                                   | 34,00   | 632,71   | 530     | 340     | 1                                                                                 |
| 4 |                                                                                   | 34,00   | 820,45   | 665     | 430     | 1                                                                                 |
| 4 |                                                                                   | 35,00   | 651,67   | 530     | 340     | 1                                                                                 |
| 4 |                                                                                   | 35,00   | 890,82   | 665     | 430     | 1                                                                                 |
| 4 |                                                                                   | 36,00   | 703,07   | 530     | 340     | 1                                                                                 |
| 4 |                                                                                   | 36,00   | 935,43   | 665     | 430     | 1                                                                                 |
| 4 |                                                                                   | 37,00   | 720,81   | 530     | 340     | 1                                                                                 |
| 4 |                                                                                   | 37,00   | 1.039,38 | 665     | 430     | 1                                                                                 |
| 4 |                                                                                   | 38,00   | 786,32   | 555     | 360     | 1                                                                                 |
| 4 |                                                                                   | 38,00   | 1.100,63 | 695     | 460     | 1                                                                                 |
| 4 |                                                                                   | 39,00   | 819,51   | 555     | 360     | 1                                                                                 |
| 4 |                                                                                   | 39,00   | 1.153,14 | 695     | 460     | 1                                                                                 |

|   |  | Ø<br>mm | €        | L<br>mm | l<br>mm |  |
|---|-----------------------------------------------------------------------------------|---------|----------|---------|---------|-------------------------------------------------------------------------------------|
| 4 |                                                                                   | 40,00   | 863,91   | 555     | 360     | 1                                                                                   |
| 4 |                                                                                   | 40,00   | 1.099,93 | 695     | 460     | 1                                                                                   |
| 4 |                                                                                   | 41,00   | 1.250,21 | 695     | 460     | 1                                                                                   |
| 4 |                                                                                   | 42,00   | 1.334,84 | 695     | 460     | 1                                                                                   |
| 4 |                                                                                   | 43,00   | 1.362,03 | 735     | 490     | 1                                                                                   |
| 4 |                                                                                   | 44,00   | 1.409,90 | 735     | 490     | 1                                                                                   |
| 4 |                                                                                   | 45,00   | 1.475,57 | 735     | 490     | 1                                                                                   |
| 4 |                                                                                   | 46,00   | 1.541,53 | 735     | 490     | 1                                                                                   |
| 4 |                                                                                   | 47,00   | 1.617,20 | 735     | 490     | 1                                                                                   |
| 4 |                                                                                   | 48,00   | 1.711,25 | 765     | 510     | 1                                                                                   |
| 4 |                                                                                   | 49,00   | 1.776,41 | 765     | 510     | 1                                                                                   |
| 4 |                                                                                   | 50,00   | 1.822,81 | 765     | 510     | 1                                                                                   |

1139

**HSS DIN 343**

| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     |        |        |        | ○    |        | ●     | ●     |        | ○     | ●     |       | ○       |    |    |        |        |        |
| 15-35 |        |        |        | 8-14 |        | 25-30 | 12-16 |        | 50-60 | 30-60 |       | 20-25   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



|   |  | Ø<br>mm | d<br>mm | €      | L<br>mm | l<br>mm |  |
|---|-------------------------------------------------------------------------------------|---------|---------|--------|---------|---------|-------------------------------------------------------------------------------------|
| 1 |                                                                                     | 10,00   | 7,00    | 71,77  | 168     | 87      | 1                                                                                   |
| 1 |                                                                                     | 11,00   | 7,70    | 74,33  | 175     | 94      | 1                                                                                   |
| 1 |                                                                                     | 12,00   | 8,40    | 76,92  | 182     | 101     | 1                                                                                   |
| 1 |                                                                                     | 13,00   | 9,10    | 80,39  | 182     | 101     | 1                                                                                   |
| 1 |                                                                                     | 14,00   | 9,80    | 85,07  | 189     | 108     | 1                                                                                   |
| 2 |                                                                                     | 15,00   | 10,50   | 91,49  | 212     | 114     | 1                                                                                   |
| 2 |                                                                                     | 16,00   | 11,20   | 97,40  | 218     | 120     | 1                                                                                   |
| 2 |                                                                                     | 17,00   | 11,90   | 106,51 | 223     | 125     | 1                                                                                   |
| 2 |                                                                                     | 18,00   | 12,60   | 115,42 | 228     | 130     | 1                                                                                   |
| 2 |                                                                                     | 19,00   | 13,30   | 137,83 | 233     | 135     | 1                                                                                   |
| 2 |                                                                                     | 20,00   | 14,00   | 139,24 | 238     | 140     | 1                                                                                   |
| 2 |                                                                                     | 21,00   | 15,00   | 149,48 | 243     | 145     | 1                                                                                   |
| 2 |                                                                                     | 22,00   | 15,50   | 163,57 | 248     | 150     | 1                                                                                   |

|   |  | Ø<br>mm | d<br>mm | €      | L<br>mm | l<br>mm |  |
|---|-------------------------------------------------------------------------------------|---------|---------|--------|---------|---------|---------------------------------------------------------------------------------------|
| 2 |                                                                                     | 23,00   | 16,00   | 175,25 | 253     | 155     | 1                                                                                     |
| 3 |                                                                                     | 24,00   | 17,00   | 188,60 | 281     | 160     | 1                                                                                     |
| 3 |                                                                                     | 25,00   | 17,50   | 201,94 | 281     | 160     | 1                                                                                     |
| 3 |                                                                                     | 26,00   | 18,00   | 222,97 | 286     | 165     | 1                                                                                     |
| 3 |                                                                                     | 27,00   | 19,00   | 240,28 | 291     | 170     | 1                                                                                     |
| 3 |                                                                                     | 28,00   | 19,50   | 260,48 | 291     | 170     | 1                                                                                     |
| 3 |                                                                                     | 30,00   | 21,00   | 302,16 | 296     | 175     | 1                                                                                     |
| 4 |                                                                                     | 32,00   | 22,00   | 340,64 | 334     | 185     | 1                                                                                     |
| 4 |                                                                                     | 34,00   | 24,00   | 377,69 | 339     | 190     | 1                                                                                     |
| 4 |                                                                                     | 35,00   | 25,00   | 409,69 | 339     | 190     | 1                                                                                     |
| 4 |                                                                                     | 36,00   | 25,50   | 417,29 | 344     | 195     | 1                                                                                     |
| 4 |                                                                                     | 38,00   | 26,50   | 476,51 | 349     | 200     | 1                                                                                     |
| 4 |                                                                                     | 40,00   | 28,00   | 524,20 | 349     | 210     | 1                                                                                     |

**P**

Aceros  
Aciers  
Steels

**M**

Aceros Inox  
Aciers Inox  
Stainless Steels

**K**

Fundición  
Fonte  
Cast Iron

**N**

Metales no ferrosos  
Métal non Ferreux  
Non Ferrous metals

**S**

Titanio y Superalloys  
Titanium et Superalloys  
Titanium and Superalloys

**H**

Materiales Duros  
Matériaux Durs  
Hard materials

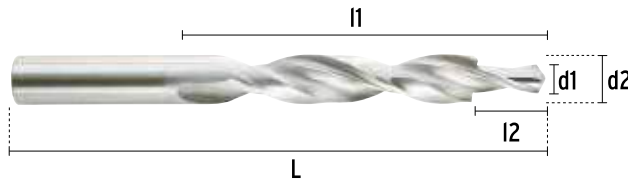
**1127**

**HSS DIN 8376**



| P          |           |        |        | M    |        | K          |            |            | N          |            |       |            | S  |    | H      |        |        |
|------------|-----------|--------|--------|------|--------|------------|------------|------------|------------|------------|-------|------------|----|----|--------|--------|--------|
| <800       | <1.000    | <1.200 | <1.400 | <950 | <1.200 | <500       | <800       | <1.400     | Al         | Cu         | Mg/Zn | Plastic    | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●<br>15-25 | ●<br>8-10 |        |        |      |        | ●<br>30-35 | ●<br>25-30 | ○<br>14-18 | ●<br>20-25 | ●<br>30-35 |       | ○<br>15-20 |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| M   | d1<br>mm | d2<br>mm | €     | L<br>mm | l1<br>mm | l2<br>mm |   |
|-----|----------|----------|-------|---------|----------|----------|---|
| M-3 | 3,40     | 6,00     | 62,69 | 93      | 57       | 9        | 1 |
| M-4 | 4,50     | 8,00     | 65,73 | 117     | 75       | 11       | 1 |
| M-5 | 5,50     | 10,00    | 78,14 | 133     | 87       | 13       | 1 |

| M    | d1<br>mm | d2<br>mm | €      | L<br>mm | l1<br>mm | l2<br>mm |   |
|------|----------|----------|--------|---------|----------|----------|---|
| M-6  | 6,60     | 11,00    | 88,29  | 142     | 94       | 15       | 1 |
| M-8  | 9,00     | 15,00    | 108,48 | 169     | 114      | 19       | 1 |
| M-10 | 11,00    | 18,00    | 215,60 | 191     | 130      | 23       | 1 |

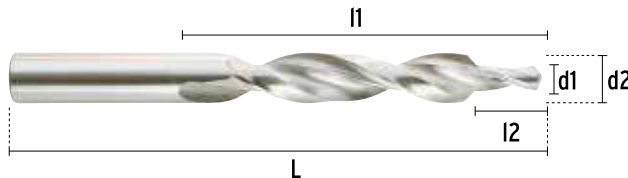
**1128**

**HSS DIN 8374**



| P          |           |        |        | M    |        | K          |            |            | N          |            |       |            | S  |    | H      |        |        |
|------------|-----------|--------|--------|------|--------|------------|------------|------------|------------|------------|-------|------------|----|----|--------|--------|--------|
| <800       | <1.000    | <1.200 | <1.400 | <950 | <1.200 | <500       | <800       | <1.400     | Al         | Cu         | Mg/Zn | Plastic    | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●<br>15-25 | ●<br>8-10 |        |        |      |        | ●<br>30-35 | ●<br>25-30 | ○<br>14-18 | ●<br>20-25 | ●<br>30-35 |       | ○<br>15-20 |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| M   | d1<br>mm | d2<br>mm | €     | L<br>mm | l1<br>mm | l2<br>mm |   |
|-----|----------|----------|-------|---------|----------|----------|---|
| M-3 | 3,20     | 6,00     | 73,15 | 93      | 57       | 9        | 1 |
| M-4 | 4,30     | 8,00     | 76,70 | 117     | 75       | 11       | 1 |
| M-5 | 5,30     | 10,00    | 91,18 | 133     | 87       | 13       | 1 |

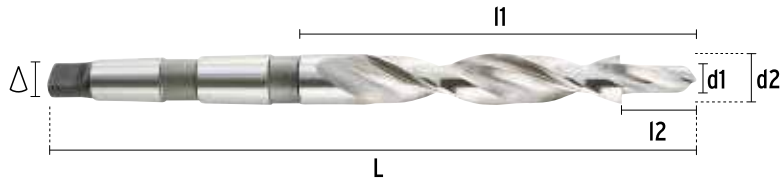
| M    | d1<br>mm | d2<br>mm | €      | L<br>mm | l1<br>mm | l2<br>mm |   |
|------|----------|----------|--------|---------|----------|----------|---|
| M-6  | 6,40     | 11,50    | 104,13 | 142     | 94       | 15       | 1 |
| M-8  | 8,40     | 15,00    | 142,45 | 169     | 114      | 19       | 1 |
| M-10 | 10,50    | 19,00    | 219,99 | 198     | 130      | 23       | 1 |

**1129 HSS DIN 8377**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      |        |        |      |        | ●     | ●     | ○      | ●     | ●     |       | ○       |    |    |        |        |        |
| 15-25 | 8-10   |        |        |      |        | 30-35 | 25-30 | 14-18  | 20-25 | 30-35 |       | 15-20   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| △ | M    | d1 mm | d2 mm | €      | L mm | l1 mm | l2 mm |   |
|---|------|-------|-------|--------|------|-------|-------|---|
| 2 | M-8  | 9,00  | 15,00 | 162,26 | 212  | 114   | 19    | 1 |
| 2 | M-10 | 11,00 | 18,00 | 182,89 | 228  | 130   | 23    | 1 |
| 2 | M-12 | 14,00 | 20,00 | 204,60 | 238  | 140   | 27    | 1 |
| 3 | M-14 | 16,00 | 24,00 | 290,15 | 281  | 160   | 31    | 1 |

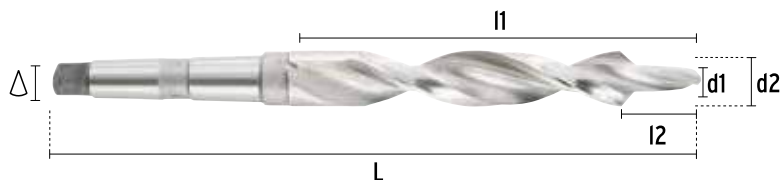
| △ | M    | d1 mm | d2 mm | €      | L mm | l1 mm | l2 mm |   |
|---|------|-------|-------|--------|------|-------|-------|---|
| 3 | M-16 | 18,00 | 26,00 | 413,71 | 286  | 165   | 35    | 1 |
| 3 | M-18 | 20,00 | 30,00 | 462,63 | 296  | 175   | 39    | 1 |
| 4 | M-20 | 22,00 | 33,00 | 521,76 | 334  | 185   | 43    | 1 |

**1130 HSS DIN 8375**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      |        |        |      |        | ●     | ●     | ○      | ●     | ●     |       | ○       |    |    |        |        |        |
| 15-25 | 8-10   |        |        |      |        | 30-35 | 25-30 | 14-18  | 20-25 | 30-35 |       | 15-20   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| △ | M   | d1 mm | d2 mm | €      | L mm | l1 mm | l2 mm |   |
|---|-----|-------|-------|--------|------|-------|-------|---|
| 1 | M-5 | 5,50  | 11,00 | 156,93 | 175  | 94    | 13    | 1 |
| 1 | M-6 | 6,60  | 13,00 | 160,13 | 182  | 101   | 15    | 1 |

| △ | M    | d1 mm | d2 mm | €      | L mm | l1 mm | l2 mm |   |
|---|------|-------|-------|--------|------|-------|-------|---|
| 2 | M-8  | 9,00  | 17,20 | 190,82 | 228  | 130   | 19    | 1 |
| 2 | M-10 | 11,00 | 21,50 | 225,92 | 248  | 150   | 23    | 1 |



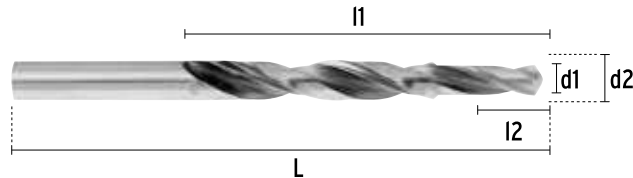
**1152**

**HSS DIN 8378**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      |        |        |      |        | ●     | ●     | ○      | ●     | ●     |       | ○       |    |    |        |        |        |
| 15-25 | 8-10   |        |        |      |        | 30-35 | 25-30 | 14-18  | 20-25 | 30-35 |       | 15-20   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| M   | d1<br>mm | d2<br>mm | €     | L<br>mm | l1<br>mm | l2<br>mm |   |
|-----|----------|----------|-------|---------|----------|----------|---|
| M-3 | 2,50     | 3,40     | 56,19 | 70      | 39       | 8,80     | 1 |
| M-4 | 3,30     | 4,50     | 60,44 | 80      | 47       | 11,40    | 1 |
| M-5 | 4,20     | 5,50     | 65,10 | 93      | 57       | 13,60    | 1 |
| M-6 | 5,00     | 6,60     | 74,06 | 101     | 63       | 16,50    | 1 |

| M    | d1<br>mm | d2<br>mm | €      | L<br>mm | l1<br>mm | l2<br>mm |   |
|------|----------|----------|--------|---------|----------|----------|---|
| M-8  | 6,80     | 9,00     | 88,23  | 125     | 81       | 21,00    | 1 |
| M-10 | 8,50     | 11,00    | 102,93 | 142     | 94       | 25,50    | 1 |
| M-12 | 10,20    | 13,50    | 128,16 | 160     | 108      | 30,00    | 1 |

**1153**

**HSS DIN 8379**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      |        |        |      |        | ●     | ●     | ○      | ●     | ●     |       | ○       |    |    |        |        |        |
| 15-25 | 8-10   |        |        |      |        | 30-35 | 25-30 | 14-18  | 20-25 | 30-35 |       | 15-20   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| △ | M    | d1<br>mm | d2<br>mm | €      | L<br>mm | l1<br>mm | l2<br>mm |   |
|---|------|----------|----------|--------|---------|----------|----------|---|
| 1 | M-8  | 6,80     | 9,00     | 143,82 | 162     | 81       | 21,00    | 1 |
| 1 | M-10 | 8,50     | 11,00    | 156,71 | 175     | 94       | 25,50    | 1 |
| 1 | M-12 | 10,20    | 13,50    | 185,12 | 189     | 108      | 30,00    | 1 |
| 2 | M-14 | 12,00    | 15,50    | 197,53 | 218     | 120      | 34,50    | 1 |

| △ | M    | d1<br>mm | d2<br>mm | €      | L<br>mm | l1<br>mm | l2<br>mm |   |
|---|------|----------|----------|--------|---------|----------|----------|---|
| 2 | M-16 | 14,00    | 17,50    | 213,18 | 228     | 130      | 38,50    | 1 |
| 2 | M-18 | 15,50    | 20,00    | 238,40 | 238     | 140      | 43,50    | 1 |
| 2 | M-20 | 17,50    | 22,00    | 288,29 | 248     | 150      | 47,50    | 1 |

1191

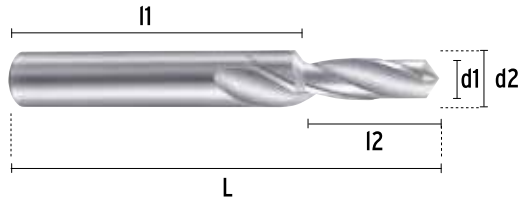
**HSSCO**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S   |      | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|-----|------|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni  | Ti   | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ○      |        | ●    |        | ●     | ○     |        | ●     | ●     | ●     | ●       | ○   | ●    |        |        |        |
| 20-30 | 12-18  | 4-8    |        | 4-10 |        | 20-25 | 10-15 |        | 15-80 | 25-60 | 60-90 | 12-70   | 2-6 | 2-10 |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

**NEW**



| M   | d1 mm | d2 mm | €     | L mm | l1 mm | l2 mm |   |
|-----|-------|-------|-------|------|-------|-------|---|
| M-3 | 2,50  | 3,40  | 37,45 | 52   | 20    | 8     | 1 |
| M-4 | 3,30  | 4,50  | 39,62 | 58   | 24    | 11    | 1 |
| M-5 | 4,20  | 5,50  | 41,37 | 66   | 28    | 13    | 1 |
| M-6 | 5,00  | 6,60  | 45,28 | 70   | 31    | 16    | 1 |

| M    | d1 mm | d2 mm | €      | L mm | l1 mm | l2 mm |   |
|------|-------|-------|--------|------|-------|-------|---|
| M-8  | 6,80  | 9,00  | 60,95  | 84   | 40    | 20    | 1 |
| M-10 | 8,50  | 11,00 | 81,85  | 95   | 47    | 24    | 1 |
| M-12 | 10,20 | 14,00 | 111,47 | 107  | 54    | 29    | 1 |

1192

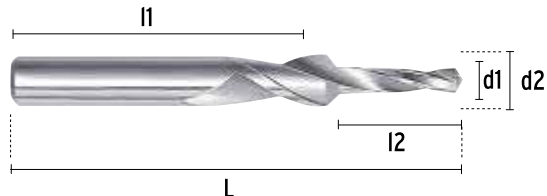
**HSSCO**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S   |      | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|-----|------|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni  | Ti   | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ○      |        | ●    |        | ●     | ○     |        | ●     | ●     | ●     | ●       | ○   | ●    |        |        |        |
| 20-30 | 12-18  | 4-8    |        | 4-10 |        | 20-25 | 10-15 |        | 15-80 | 25-60 | 60-90 | 12-70   | 2-6 | 2-10 |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

**NEW**

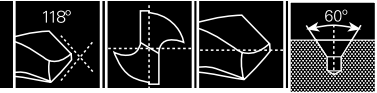


| M   | d1 mm | d2 mm | €      | L mm | l2 mm |   |
|-----|-------|-------|--------|------|-------|---|
| M-4 | 4,30  | 8,60  | 99,27  | 110  | 30    | 1 |
| M-4 | 5,30  | 10,40 | 104,50 | 110  | 30    | 1 |
| M-6 | 6,40  | 12,40 | 111,47 | 110  | 30    | 1 |

| M    | d1 mm | d2 mm | €      | L mm | l2 mm |   |
|------|-------|-------|--------|------|-------|---|
| M-8  | 8,40  | 16,40 | 148,03 | 110  | 30    | 1 |
| M-10 | 10,50 | 20,40 | 179,38 | 110  | 30    | 1 |

**1132**

**HSS DIN 333 A**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      |        |        |      |        | ●     | ○     |        | ●     | ●     |       | ○       |    |    |        |        |        |
| 20-30 | 8-12   |        |        |      |        | 20-25 | 15-20 |        | 15-20 | 25-30 |       | 10-15   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| d1 mm | d2 mm | €    | L mm  | I mm |   |
|-------|-------|------|-------|------|---|
| 1,00  | 3,15  | 6,07 | 31,50 | 1,60 | 1 |
| 1,25  | 3,15  | 6,07 | 33,50 | 1,90 | 1 |
| 1,25  | 4,00  | 6,70 | 35,50 | 1,90 | 1 |
| 1,60  | 4,00  | 6,07 | 37,50 | 2,40 | 1 |
| 1,60  | 5,00  | 7,14 | 40,00 | 2,40 | 1 |
| 2,00  | 5,00  | 6,54 | 42,00 | 2,90 | 1 |
| 2,00  | 6,30  | 7,59 | 45,00 | 2,90 | 1 |
| 2,50  | 6,30  | 7,26 | 47,00 | 3,60 | 1 |
| 2,50  | 8,00  | 8,49 | 50,00 | 3,60 | 1 |
| 3,15  | 8,00  | 8,00 | 52,00 | 4,40 | 1 |

| d1 mm | d2 mm | €      | L mm   | I mm  |   |
|-------|-------|--------|--------|-------|---|
| 3,15  | 10,00 | 9,40   | 56,00  | 4,40  | 1 |
| 4,00  | 10,00 | 10,91  | 59,00  | 5,60  | 1 |
| 4,00  | 12,50 | 12,88  | 63,00  | 5,60  | 1 |
| 5,00  | 12,50 | 18,28  | 66,00  | 6,90  | 1 |
| 5,00  | 16,00 | 31,12  | 71,00  | 6,90  | 1 |
| 6,30  | 16,00 | 26,11  | 74,00  | 8,60  | 1 |
| 6,30  | 20,00 | 40,17  | 80,00  | 8,60  | 1 |
| 10,00 | 25,00 | 78,73  | 100,00 | 31,50 | 1 |
| 12,50 | 31,50 | 187,87 | 125,00 | 33,50 | 1 |

**1188**

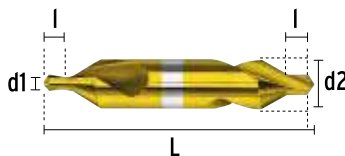
**HSS DIN 333 A**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      |        |        |      |        | ●     | ○     |        | ●     | ●     |       | ○       |    |    |        |        |        |
| 30-40 | 12-16  |        |        |      |        | 30-35 | 20-30 |        | 20-30 | 35-40 |       | 10-15   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

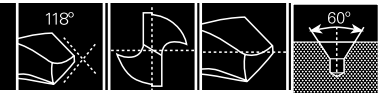
**NEW**



| d1 mm | d2 mm | €     | L mm  | I mm |   |
|-------|-------|-------|-------|------|---|
| 1,00  | 3,15  | 11,57 | 31,50 | 1,60 | 1 |
| 1,25  | 3,15  | 11,57 | 33,50 | 1,90 | 1 |
| 1,60  | 4,00  | 12,10 | 37,50 | 2,40 | 1 |
| 2,00  | 5,00  | 13,25 | 42,00 | 2,90 | 1 |
| 2,50  | 6,30  | 14,42 | 47,00 | 3,60 | 1 |
| 3,15  | 8,00  | 15,10 | 52,00 | 4,40 | 1 |

| d1 mm | d2 mm | €      | L mm   | I mm  |   |
|-------|-------|--------|--------|-------|---|
| 4,00  | 10,00 | 21,00  | 59,00  | 5,60  | 1 |
| 5,00  | 12,50 | 26,88  | 66,00  | 6,90  | 1 |
| 6,30  | 16,00 | 28,73  | 74,00  | 8,60  | 1 |
| 10,00 | 25,00 | 86,76  | 100,00 | 31,50 | 1 |
| 12,00 | 31,50 | 206,66 | 125,00 | 33,50 | 1 |

**1193 HM-MD DIN 333 A**



| P     |        |        |        | M     |        | K     |       |        | N      |       |         |         | S     |       | H      |        |        |
|-------|--------|--------|--------|-------|--------|-------|-------|--------|--------|-------|---------|---------|-------|-------|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500  | <800  | <1.400 | Al     | Cu    | Mg/Zn   | Plastic | Ni    | Ti    | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      | ●      | ●     | ●      | ●     | ●     | ●      | ●      | ●     | ●       | ●       | ●     | ●     | ●      | ●      | ●      |
| 45-65 | 40-55  | 25-30  | 20-25  | 40-55 | 25-30  | 40-55 | 35-45 | 20-25  | 80-130 | 25-65 | 100-110 | 70-200  | 20-30 | 15-30 | 15-20  | 10-15  | 4-6    |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

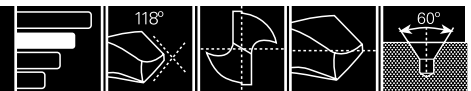
**NEW**



| d1 mm | d2 mm | €     | L mm  | l mm |   |
|-------|-------|-------|-------|------|---|
| 1,00  | 3,15  | 56,38 | 31,50 | 1,60 | 1 |
| 1,25  | 3,15  | 56,38 | 33,50 | 1,90 | 1 |
| 1,60  | 4,00  | 58,00 | 37,50 | 2,40 | 1 |
| 2,00  | 5,00  | 72,49 | 42,00 | 2,90 | 1 |
| 2,50  | 6,30  | 86,19 | 47,00 | 3,60 | 1 |

| d1 mm | d2 mm | €      | L mm  | l mm |   |
|-------|-------|--------|-------|------|---|
| 3,15  | 8,00  | 104,71 | 52,00 | 4,40 | 1 |
| 4,00  | 10,00 | 139,35 | 59,00 | 5,60 | 1 |
| 5,00  | 12,50 | 235,21 | 66,00 | 6,90 | 1 |
| 6,30  | 16,00 | 372,14 | 74,00 | 8,60 | 1 |

**1133 HSS DIN 333 A**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      | ●      | ●    | ●      | ●     | ●     | ●      | ●     | ●     | ●     | ●       | ●  | ●  | ●      | ●      | ●      |
| 20-30 | 8-12   |        |        |      |        | 20-25 | 15-20 |        | 15-20 | 25-30 |       | 10-15   |    |    |        |        |        |

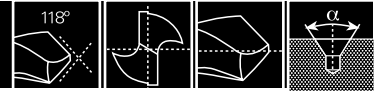
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| d1 mm | d2 mm | €     | L mm   | l mm |   |
|-------|-------|-------|--------|------|---|
| 1,00  | 4,00  | 18,92 | 60,00  | 1,30 | 1 |
| 1,50  | 5,00  | 19,26 | 60,00  | 2,00 | 1 |
| 2,00  | 6,00  | 20,08 | 80,00  | 2,50 | 1 |
| 2,50  | 8,00  | 24,39 | 80,00  | 3,10 | 1 |
| 3,00  | 8,00  | 24,39 | 80,00  | 3,90 | 1 |
| 1,00  | 4,00  | 47,22 | 120,00 | 1,30 | 1 |
| 1,50  | 5,00  | 44,88 | 120,00 | 2,00 | 1 |

| d1 mm | d2 mm | €     | L mm   | l mm |   |
|-------|-------|-------|--------|------|---|
| 2,00  | 6,00  | 44,88 | 120,00 | 2,50 | 1 |
| 2,50  | 8,00  | 51,96 | 120,00 | 3,10 | 1 |
| 3,00  | 8,00  | 51,96 | 120,00 | 3,90 | 1 |
| 3,00  | 10,00 | 59,01 | 120,00 | 3,90 | 1 |
| 4,00  | 10,00 | 59,01 | 120,00 | 5,00 | 1 |
| 4,00  | 12,00 | 70,42 | 120,00 | 5,00 | 1 |
| 5,00  | 14,00 | 84,58 | 120,00 | 6,30 | 1 |

## 1135 HSS DIN 333 R



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      |        |        |      |        | ●     | ○     |        | ●     | ●     |       | ○       |    |    |        |        |        |
| 20-30 | 8-12   |        |        |      |        | 20-25 | 15-20 |        | 15-20 | 25-30 |       | 10-15   |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| d1<br>mm | d2<br>mm | €    | L<br>mm | l<br>mm |  |
|----------|----------|------|---------|---------|-----------------------------------------------------------------------------------|
| 1,00     | 3,15     | 6,67 | 31,50   | 3,00    | 1                                                                                 |
| 1,25     | 3,15     | 6,67 | 33,50   | 3,35    | 1                                                                                 |
| 1,25     | 4,00     | 6,67 | 35,50   | 3,75    | 1                                                                                 |
| 1,60     | 4,00     | 6,67 | 35,50   | 4,25    | 1                                                                                 |
| 1,60     | 5,00     | 7,22 | 40,00   | 4,75    | 1                                                                                 |
| 2,00     | 5,00     | 7,22 | 40,00   | 5,30    | 1                                                                                 |
| 2,00     | 6,30     | 8,02 | 45,00   | 6,00    | 1                                                                                 |
| 2,50     | 6,30     | 8,00 | 45,00   | 6,70    | 1                                                                                 |
| 2,50     | 8,00     | 8,83 | 50,00   | 7,50    | 1                                                                                 |
| 3,15     | 8,00     | 8,83 | 50,00   | 8,50    | 1                                                                                 |

| d1<br>mm | d2<br>mm | €      | L<br>mm | l<br>mm |  |
|----------|----------|--------|---------|---------|-------------------------------------------------------------------------------------|
| 3,15     | 10,00    | 11,50  | 56,00   | 9,50    | 1                                                                                   |
| 4,00     | 10,00    | 11,50  | 56,00   | 10,60   | 1                                                                                   |
| 4,00     | 12,50    | 19,20  | 63,00   | 11,80   | 1                                                                                   |
| 5,00     | 12,50    | 19,23  | 63,00   | 13,20   | 1                                                                                   |
| 5,00     | 16,00    | 27,32  | 71,00   | 15,00   | 1                                                                                   |
| 6,30     | 16,00    | 27,51  | 71,00   | 17,00   | 1                                                                                   |
| 6,30     | 20,00    | 49,01  | 80,00   | 19,00   | 1                                                                                   |
| 8,00     | 20,00    | 51,53  | 80,00   | 21,20   | 1                                                                                   |
| 10,00    | 25,00    | 82,81  | 100,00  | 31,50   | 1                                                                                   |
| 12,50    | 31,50    | 197,58 | 125,00  | 33,50   | 1                                                                                   |

## 1137 HSS DIN 333 B



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |    | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|----|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      |        |        |      |        | ●     | ○     |        | ●     | ●     |       | ○       |    |    |        |        |        |
| 20-30 | 8-12   |        |        |      |        | 20-25 | 15-20 |        | 15-20 | 25-30 |       | 10-15   |    |    |        |        |        |

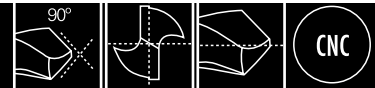
Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| d1<br>mm | d2<br>mm | €     | L<br>mm | l<br>mm |  |
|----------|----------|-------|---------|---------|-------------------------------------------------------------------------------------|
| 1,00     | 4,00     | 11,01 | 35,50   | 1,60    | 1                                                                                   |
| 1,25     | 5,00     | 11,01 | 40,00   | 1,90    | 1                                                                                   |
| 1,60     | 6,30     | 11,01 | 45,00   | 2,40    | 1                                                                                   |
| 2,00     | 8,00     | 11,01 | 50,00   | 2,90    | 1                                                                                   |
| 2,50     | 10,00    | 12,64 | 56,00   | 3,60    | 1                                                                                   |

| d1<br>mm | d2<br>mm | €     | L<br>mm | l<br>mm |  |
|----------|----------|-------|---------|---------|---------------------------------------------------------------------------------------|
| 3,15     | 11,20    | 14,49 | 60,00   | 4,40    | 1                                                                                     |
| 4,00     | 14,00    | 22,27 | 67,00   | 5,60    | 1                                                                                     |
| 5,00     | 18,00    | 31,05 | 75,00   | 6,90    | 1                                                                                     |
| 6,30     | 20,00    | 45,32 | 80,00   | 8,60    | 1                                                                                     |

**1138 HSSCO**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |       | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|-------|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti    | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        | ●    |        | ●     | ●     |        | ●     | ●     |       | ●       |    | ●     |        |        |        |
| 20-30 | 8-12   | 6-10   |        | 6-12 |        | 20-25 | 15-20 |        | 15-20 | 25-30 |       | 25-30   |    | 10-12 |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 3,00    | 22,31 | 50,00   | 10,00   | 1 |
| 4,00    | 22,31 | 52,00   | 12,00   | 1 |
| 5,00    | 25,15 | 60,00   | 15,00   | 1 |
| 6,00    | 25,15 | 66,00   | 20,00   | 1 |
| 8,00    | 28,42 | 79,00   | 25,00   | 1 |

| Ø<br>mm | €      | L<br>mm | l<br>mm |   |
|---------|--------|---------|---------|---|
| 10,00   | 28,42  | 89,00   | 25,00   | 1 |
| 12,00   | 39,30  | 102,00  | 30,00   | 1 |
| 16,00   | 54,20  | 115,00  | 35,00   | 1 |
| 20,00   | 106,64 | 131,00  | 40,00   | 1 |

**1155 HSSCO**



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |       | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|-------|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti    | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        | ●    |        | ●     | ●     |        | ●     | ●     |       | ●       |    | ●     |        |        |        |
| 20-30 | 8-12   | 6-10   |        | 6-12 |        | 20-25 | 15-20 |        | 15-20 | 25-30 |       | 25-30   |    | 10-12 |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

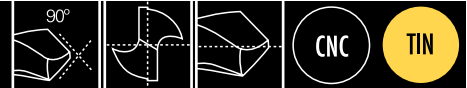


| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 3,00    | 22,31 | 46      | 12      | 1 |
| 4,00    | 22,31 | 55      | 12      | 1 |
| 5,00    | 25,15 | 62      | 14      | 1 |
| 6,00    | 25,15 | 66      | 16      | 1 |
| 8,00    | 28,42 | 79      | 21      | 1 |

| Ø<br>mm | €      | L<br>mm | l<br>mm |   |
|---------|--------|---------|---------|---|
| 10,00   | 28,42  | 89      | 25      | 1 |
| 12,00   | 39,30  | 102     | 30      | 1 |
| 16,00   | 54,20  | 115     | 38      | 1 |
| 20,00   | 106,64 | 131     | 45      | 1 |

1189

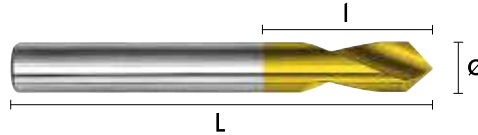
HSSCO



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |       | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|-------|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti    | 50 HRC | 55 HRC | 60 HRC |
| •     | •      | •      |        | •    |        | •     | •     |        | •     | •     |       | •       |    | •     |        |        |        |
| 20-30 | 12-16  | 10-14  |        | 6-12 |        | 30-35 | 20-25 |        | 20-25 | 35-40 |       | 35-40   |    | 12-16 |        |        |        |

Vc (m/min). • Optima / Optimun ○ Alternativo / Alternative

NEW



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 3,00    | 29,00 | 50      | 10      | 1 |
| 4,00    | 29,00 | 52      | 12      | 1 |
| 5,00    | 32,70 | 60      | 15      | 1 |
| 6,00    | 32,70 | 66      | 20      | 1 |
| 8,00    | 36,95 | 79      | 25      | 1 |

| Ø<br>mm | €      | L<br>mm | l<br>mm |   |
|---------|--------|---------|---------|---|
| 10,00   | 36,95  | 89      | 25      | 1 |
| 12,00   | 51,09  | 102     | 30      | 1 |
| 16,00   | 70,46  | 115     | 35      | 1 |
| 20,00   | 138,63 | 131     | 40      | 1 |

1190

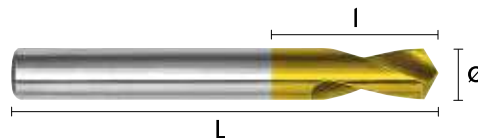
HSSCO



| P     |        |        |        | M    |        | K     |       |        | N     |       |       |         | S  |       | H      |        |        |
|-------|--------|--------|--------|------|--------|-------|-------|--------|-------|-------|-------|---------|----|-------|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500  | <800  | <1.400 | Al    | Cu    | Mg/Zn | Plastic | Ni | Ti    | 50 HRC | 55 HRC | 60 HRC |
| •     | •      | •      |        | •    |        | •     | •     |        | •     | •     |       | •       |    | •     |        |        |        |
| 20-30 | 12-16  | 10-14  |        | 6-12 |        | 30-35 | 20-25 |        | 20-25 | 35-40 |       | 35-40   |    | 12-16 |        |        |        |

Vc (m/min). • Optima / Optimun ○ Alternativo / Alternative

NEW



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 3,00    | 29,00 | 46      | 12      | 1 |
| 4,00    | 29,00 | 55      | 12      | 1 |
| 5,00    | 32,70 | 62      | 14      | 1 |
| 6,00    | 32,70 | 66      | 16      | 1 |
| 8,00    | 36,95 | 79      | 21      | 1 |

| Ø<br>mm | €      | L<br>mm | l<br>mm |   |
|---------|--------|---------|---------|---|
| 10,00   | 36,95  | 89      | 25      | 1 |
| 12,00   | 51,09  | 102     | 30      | 1 |
| 16,00   | 70,46  | 115     | 38      | 1 |
| 20,00   | 138,63 | 131     | 45      | 1 |

1179

**HM-MD**

1XD



| P     |        |        |        | M     |        | K     |       |        | N      |        |       |         | S    |       | H      |        |        |
|-------|--------|--------|--------|-------|--------|-------|-------|--------|--------|--------|-------|---------|------|-------|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500  | <800  | <1.400 | Al     | Cu     | Mg/Zn | Plastic | Ni   | Ti    | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        | ●     |        | ●     | ●     |        | ●      | ●      |       | ○       | ○    | ●     |        |        |        |
| 55-80 | 40-55  | 35-45  |        | 15-30 |        | 60-80 | 40-60 |        | 70-160 | 60-120 |       | 50-70   | 8-20 | 20-30 |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | d<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|---------|-------|---------|---------|---|
| 6,00    | 6       | 24,63 | 65      | 15      | 1 |
| 8,00    | 8       | 42,42 | 80      | 20      | 1 |

| Ø<br>mm | d<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|---------|-------|---------|---------|---|
| 10,00   | 10      | 61,17 | 90      | 25      | 1 |
| 12,00   | 12      | 85,83 | 100     | 30      | 1 |

1180

**HM-MD**

1XD



| P     |        |        |        | M     |        | K     |       |        | N      |        |       |         | S    |       | H      |        |        |
|-------|--------|--------|--------|-------|--------|-------|-------|--------|--------|--------|-------|---------|------|-------|--------|--------|--------|
| <800  | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500  | <800  | <1.400 | Al     | Cu     | Mg/Zn | Plastic | Ni   | Ti    | 50 HRC | 55 HRC | 60 HRC |
| ●     | ●      | ●      |        | ●     |        | ●     | ●     |        | ●      | ●      |       | ○       | ○    | ●     |        |        |        |
| 55-80 | 40-55  | 35-45  |        | 15-30 |        | 60-80 | 40-60 |        | 70-160 | 60-120 |       | 50-70   | 8-20 | 20-30 |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | d<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|---------|-------|---------|---------|---|
| 6,00    | 6       | 24,63 | 65      | 15      | 1 |
| 8,00    | 8       | 42,42 | 80      | 20      | 1 |

| Ø<br>mm | d<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|---------|-------|---------|---------|---|
| 10,00   | 10      | 61,17 | 90      | 25      | 1 |
| 12,00   | 12      | 85,83 | 100     | 30      | 1 |



1185

HM-MD

1XD



| P      |        |        |        | M     |        | K      |       |        | N       |        |       |         | S     |       | H      |        |        |
|--------|--------|--------|--------|-------|--------|--------|-------|--------|---------|--------|-------|---------|-------|-------|--------|--------|--------|
| <800   | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500   | <800  | <1.400 | Al      | Cu     | Mg/Zn | Plastic | Ni    | Ti    | 50 HRC | 55 HRC | 60 HRC |
| ●      | ●      | ●      |        | ●     |        | ●      | ●     |        | ●       | ●      |       | ○       | ○     | ●     |        |        |        |
| 70-100 | 55-75  | 50-60  |        | 20-35 |        | 80-100 | 55-80 |        | 100-200 | 80-160 |       | 50-70   | 12-20 | 25-35 |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



| Ø<br>mm | d<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|---------|-------|---------|---------|---|
| 6,00    | 6       | 32,02 | 65      | 15      | 1 |
| 8,00    | 8       | 55,15 | 80      | 20      | 1 |

| Ø<br>mm | d<br>mm | €      | L<br>mm | l<br>mm |   |
|---------|---------|--------|---------|---------|---|
| 10,00   | 10      | 79,52  | 90      | 25      | 1 |
| 12,00   | 12      | 111,58 | 100     | 30      | 1 |

1186

HM-MD

1XD



| P      |        |        |        | M     |        | K      |       |        | N       |        |       |         | S     |       | H      |        |        |
|--------|--------|--------|--------|-------|--------|--------|-------|--------|---------|--------|-------|---------|-------|-------|--------|--------|--------|
| <800   | <1.000 | <1.200 | <1.400 | <950  | <1.200 | <500   | <800  | <1.400 | Al      | Cu     | Mg/Zn | Plastic | Ni    | Ti    | 50 HRC | 55 HRC | 60 HRC |
| ●      | ●      | ●      |        | ●     |        | ●      | ●     |        | ●       | ●      |       | ○       | ○     | ●     |        |        |        |
| 70-100 | 55-75  | 50-60  |        | 20-35 |        | 80-100 | 55-80 |        | 100-200 | 80-160 |       | 50-70   | 12-20 | 25-35 |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

NEW



| Ø<br>mm | d<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|---------|-------|---------|---------|---|
| 6,00    | 6       | 32,02 | 65      | 15      | 1 |
| 8,00    | 8       | 55,15 | 80      | 20      | 1 |

| Ø<br>mm | d<br>mm | €      | L<br>mm | l<br>mm |   |
|---------|---------|--------|---------|---------|---|
| 10,00   | 10      | 79,52  | 90      | 25      | 1 |
| 12,00   | 12      | 111,58 | 100     | 30      | 1 |

**1119**

**HSSCO DIN 1897 N Soldadura / Soudure / Welding**



| P    |        |        |        | M    |        | K    |      |        | N  |    |       |         | S  |    | H      |        |        |
|------|--------|--------|--------|------|--------|------|------|--------|----|----|-------|---------|----|----|--------|--------|--------|
| <800 | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500 | <800 | <1.400 | Al | Cu | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 6,00    | 12,85 | 66      | 28      | 1 |
| 7,00    | 14,16 | 74      | 34      | 1 |

| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 8,00    | 15,52 | 79      | 37      | 1 |
| 10,00   | 17,56 | 89      | 43      | 1 |

**1194**

**HSSCO DIN 1897N Soldadura / Soudure / Welding**



| P    |        |        |        | M    |        | K    |      |        | N  |    |       |         | S  |    | H      |        |        |
|------|--------|--------|--------|------|--------|------|------|--------|----|----|-------|---------|----|----|--------|--------|--------|
| <800 | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500 | <800 | <1.400 | Al | Cu | Mg/Zn | Plastic | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative

**NEW**



| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 6,00    | 22,49 | 66      | 28      | 1 |
| 7,00    | 24,79 | 74      | 34      | 1 |

| Ø<br>mm | €     | L<br>mm | l<br>mm |   |
|---------|-------|---------|---------|---|
| 8,00    | 27,16 | 79      | 37      | 1 |
| 10,00   | 30,72 | 89      | 43      | 1 |

**5114**

**HSS**



| P          |        |        |        | M    |        | K    |      |        | N          |            |       |            | S  |    | H      |        |        |
|------------|--------|--------|--------|------|--------|------|------|--------|------------|------------|-------|------------|----|----|--------|--------|--------|
| <800       | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500 | <800 | <1.400 | Al         | Cu         | Mg/Zn | Plastic    | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●<br>10-25 |        |        |        |      |        |      |      |        | ●<br>15-20 | ●<br>25-30 |       | ●<br>25-30 |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | Z |   |
|---------|-------|---------|---|---|
| 6,00    | 16,70 | 90      | 5 | 1 |
| 8,00    | 22,84 | 90      | 7 | 1 |

**5115**

**HSS**



| P          |        |        |        | M    |        | K    |      |        | N          |            |       |            | S  |    | H      |        |        |
|------------|--------|--------|--------|------|--------|------|------|--------|------------|------------|-------|------------|----|----|--------|--------|--------|
| <800       | <1.000 | <1.200 | <1.400 | <950 | <1.200 | <500 | <800 | <1.400 | Al         | Cu         | Mg/Zn | Plastic    | Ni | Ti | 50 HRC | 55 HRC | 60 HRC |
| ●<br>15-35 |        |        |        |      |        |      |      |        | ●<br>20-25 | ●<br>35-40 |       | ●<br>35-40 |    |    |        |        |        |

Vc (m/min). ● Optima / Optimun ○ Alternativo / Alternative



| Ø<br>mm | €     | L<br>mm | Z |   |
|---------|-------|---------|---|---|
| 6,00    | 30,32 | 90      | 5 | 1 |
| 8,00    | 39,65 | 90      | 7 | 1 |

## 6110 Espiga / Queue à tenon / Bit shank



|    |  | DIN 228 | €     | L<br>mm | gr  |   |
|----|--|---------|-------|---------|-----|---|
| 1  |  | B-12    | 9,89  | 89      | 65  | 1 |
| 1  |  | B-16    | 9,89  | 99      | 80  | 1 |
| 1  |  | B-18    | 9,89  | 107     | 110 | 1 |
| >2 |  | B-12    | 11,98 | 106     | 140 | 1 |
| 2  |  | B-16    | 11,98 | 112     | 160 | 1 |
| 2  |  | B-18    | 11,98 | 119     | 185 | 1 |

|    |  | DIN 228 | €     | L<br>mm | gr    |   |
|----|--|---------|-------|---------|-------|---|
| >3 |  | B-16    | 14,62 | 134     | 305   | 1 |
| 3  |  | B-18    | 14,62 | 140     | 330   | 1 |
| >4 |  | B-16    | 20,94 | 156     | 120   | 1 |
| 4  |  | B-18    | 22,58 | 165     | 640   | 1 |
| >5 |  | B-16    | 89,16 | 221     | 1.570 | 1 |
| 5  |  | B-18    | 89,16 | 221     | 1.590 | 1 |

## 6111 Casquillo DIN 2185 / Douille de réduction / Drill sleeve



|       |  | €     | L<br>mm | gr    |   |
|-------|--|-------|---------|-------|---|
| 2 x 1 |  | 24,11 | 92      | 90    | 1 |
| 3 x 1 |  | 29,77 | 99      | 200   | 1 |
| 3 x 2 |  | 29,77 | 112     | 180   | 1 |
| 4 x 1 |  | 41,64 | 124     | 510   | 1 |
| 4 x 2 |  | 39,14 | 124     | 420   | 1 |
| 4 x 3 |  | 39,14 | 140     | 370   | 1 |
| 5 x 1 |  | 69,06 | 180     | 1.550 | 1 |

|       |  | €      | L<br>mm | gr    |   |
|-------|--|--------|---------|-------|---|
| 5 x 2 |  | 65,45  | 156     | 1.200 | 1 |
| 5 x 3 |  | 65,45  | 156     | 1.150 | 1 |
| 5 x 4 |  | 76,39  | 171     | 1.023 | 1 |
| 6 x 3 |  | 127,12 | 230     | 3.800 | 1 |
| 6 x 4 |  | 144,23 | 230     | 3.390 | 1 |
| 6 x 5 |  | 144,23 | 230     | 2.700 | 1 |

## 6114 Contrapunto / Contrepointe / Fixed centre



|   |  | HSS<br>€ | HM<br>€ |   |
|---|--|----------|---------|---|
| 1 |  | 14,94    | -       | 1 |
| 2 |  | 19,90    | -       | 1 |
| 3 |  | 30,91    | 74,68   | 1 |

|   |  | HSS<br>€ | HM<br>€ |   |
|---|--|----------|---------|---|
| 4 |  | 48,31    | 91,06   | 1 |
| 5 |  | 68,23    | 178,02  | 1 |
| 6 |  | 263,10   | -       | 1 |

## 6112 Alargadera / Adaptateur / Extension piece



| Ext. | Int. | €      | L mm |   |
|------|------|--------|------|---|
| 1    | 1    | 30,39  | 145  | 1 |
| 1    | 2    | 47,06  | 160  | 1 |
| 2    | 1    | 30,39  | 160  | 1 |
| 2    | 2    | 44,17  | 175  | 1 |
| 2    | 3    | 63,97  | 196  | 1 |
| 3    | 1    | 44,17  | 175  | 1 |
| 3    | 2    | 45,61  | 194  | 1 |
| 3    | 3    | 66,89  | 215  | 1 |
| 3    | 4    | 107,89 | 240  | 1 |
| 4    | 1    | 63,97  | 200  | 1 |

| Ext. | Int. | €      | L mm |   |
|------|------|--------|------|---|
| 4    | 2    | 62,52  | 215  | 1 |
| 4    | 3    | 65,43  | 240  | 1 |
| 4    | 4    | 107,89 | 265  | 1 |
| 4    | 5    | 181,08 | 300  | 1 |
| 5    | 1    | 123,33 | 232  | 1 |
| 5    | 2    | 114,67 | 247  | 1 |
| 5    | 3    | 121,09 | 268  | 1 |
| 5    | 4    | 136,88 | 300  | 1 |
| 5    | 5    | 226,46 | 335  | 1 |

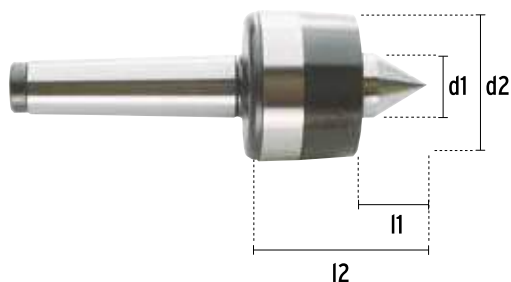
## 6113 Expulsor / Éjecteur / Ejector



| Ext.  | Int. | €     | gr  |   |
|-------|------|-------|-----|---|
| 1 - 2 |      | 12,88 | 50  | 1 |
| 2 - 3 |      | 15,24 | 80  | 1 |
| 3 - 4 |      | 20,10 | 160 | 1 |

| Ext.  | Int. | €     | gr  |   |
|-------|------|-------|-----|---|
| 4 - 5 |      | 27,31 | 350 | 1 |
| 5 - 6 |      | 44,39 | 690 | 1 |

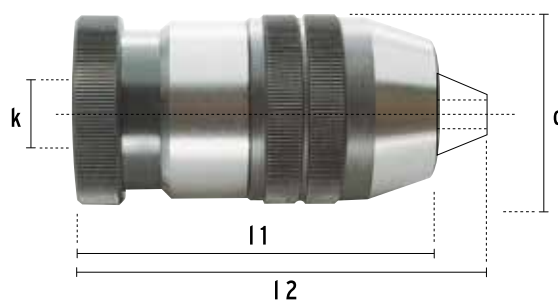
## 6115 Punto giratorio / Pointe tournante / Revolving lathe centre



| Ext. | d1 mm | d2 mm | l1 mm | l2 mm | Kg   | €      |   |
|------|-------|-------|-------|-------|------|--------|---|
| 1    | 12    | 32    | 18    | 42    | 180  | 143,25 | 1 |
| 2    | 16    | 40    | 23    | 46    | 400  | 159,79 | 1 |
| 3    | 24    | 45    | 27    | 53    | 600  | 214,81 | 1 |
| 4    | 24    | 59    | 36    | 65    | 1200 | 254,58 | 1 |
| 5    | 38    | 79    | 41    | 77    | 1500 | 367,94 | 1 |

## 6101 HP1

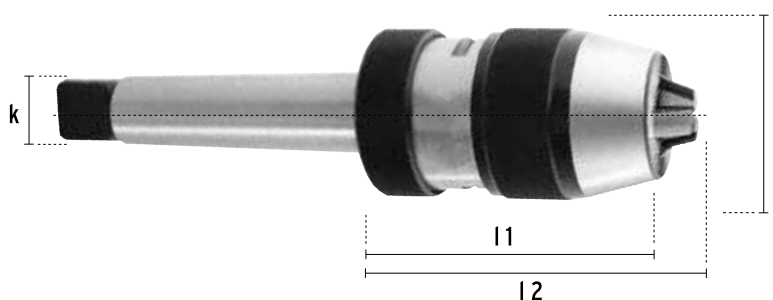
- > **Componentes totalmente templados y rectificados.**  
Composants entièrement trempés et rectifiés.  
Fully tempered and rectified components.
- > **Uso en taladros de precisión estacionarios, fresadoras.**  
Pour perçages de précision stationnaires, fraiseuses.  
For use with stationary precision drills, milling machines.
- > **Excentricidad máxima 0,04 mm.**  
Excentricité maximum de 0,04 mm.  
Maximum eccentricity 0.04 mm.



| Ø<br>mm      | d<br>mm | k<br>mm  | Int.       | €      | l1<br>mm | l2<br>mm |   | Husillo<br>Arbre<br>Spindle<br>€ | Juego de garras<br>Jeux de griffes<br>Set of claws<br>€ |
|--------------|---------|----------|------------|--------|----------|----------|---|----------------------------------|---------------------------------------------------------|
| 0,00 - 10,00 | 41      | B16      | 1/2" - 20H | 171,74 | 81       | 89       | 1 | 29,38                            | 39,85                                                   |
| 1,00 - 13,00 | 46      | B16      | 1/2" - 20H | 188,56 | 88       | 89       | 1 | 31,55                            | 42,76                                                   |
| 3,00 - 16,00 | 55      | B16, B18 | -          | 213,00 | 95       | 107      | 1 | 31,55                            | 44,19                                                   |

## 6120 HP1-CM

- > **Portabrocas automático alta precisión con espiga integrada (Cono Morse)**  
Mandrin automatique de haute précision avec queue à tenon intégrée (Cone Morse)  
High precision automatic drill chuck with bit shank (Taper Shank)

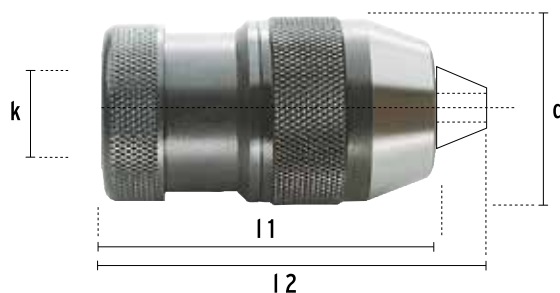


| Ø<br>mm      | d<br>mm | k<br>mm       | €      | l1<br>mm | l2<br>mm |   | Husillo<br>Arbre<br>Spindle<br>€ | Juego de garras<br>Jeux de griffes<br>Set of claws<br>€ |
|--------------|---------|---------------|--------|----------|----------|---|----------------------------------|---------------------------------------------------------|
| 0,00 - 10,00 | 43      | CM2           | 372,20 | 73       | 82       | 1 | 29,38                            | 39,85                                                   |
| 1,00 - 13,00 | 48      | CM2, CM3, CM4 | 404,10 | 80       | 92       | 1 | 31,55                            | 42,76                                                   |
| 3,00 - 16,00 | 54      | CM2, CM3, CM4 | 482,75 | 85       | 96       | 1 | 31,55                            | 44,19                                                   |



## 6102 HP2

- > **Componentes parcialmente templados y rectificados.**  
Composants partiellement trempés et rectifiés.  
Partially tempered and rectified components.
- > **Uso industrial para taladros fijos y portátiles.**  
Usage industriel pour perceuses fixes et portables.  
For industrial use with fixed and portable drills.
- > **Excentricidad máxima 0,20 mm.**  
Excentricité maximum de 0,20 mm.  
Maximum eccentricity 0.20 mm.



| Ø<br>mm      | d<br>mm |  | k<br>Int.             | €      | l1<br>mm | l2<br>mm |  | Husillo<br>Arbre<br>Spindle<br>€ | Juego de garras<br>Jeux de griffes<br>Set of claws<br>€ |
|--------------|---------|------------------------------------------------------------------------------------|-----------------------|--------|----------|----------|--------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------|
| 0,00 - 10,00 | 39      | B12                                                                                | 1/2" - 20H 3/8" - 24H | 94,06  | 73       | 80       | 1                                                                                    | 19,85                            | 39,66                                                   |
| 2,00 - 13,00 | 46      | B16                                                                                | 1/2" - 20H 3/8" - 24H | 118,22 | 87       | 95       | 1                                                                                    | 22,90                            | 42,86                                                   |
| 3,00 - 16,00 | 51      | B16,B18                                                                            | 5/8" - 16H 1/2" - 20H | 157,04 | 102      | 115      | 1                                                                                    | 22,90                            | 42,86                                                   |
| 5,00 - 20,00 | 56      | B18                                                                                | -                     | 207,03 | 95       | 110      | 1                                                                                    | 28,04                            | 50,41                                                   |

## 6103 HP3

- > **Uso industrial para taladros fijos y portátiles.**  
Usage industriel pour perceuses fixes et portables.  
For industrial use with fixed and portable drills.
- > **Excentricidad no garantizada.**  
Excentricité non garantie.  
Maximum not guaranteed.



| Ø<br>mm      | d<br>mm |  | k<br>Int.               | €     | l1<br>mm | l2<br>mm |  |
|--------------|---------|-------------------------------------------------------------------------------------|-------------------------|-------|----------|----------|---------------------------------------------------------------------------------------|
| 1,00 - 10,00 | 35      | B12*                                                                                | 1/2" - 20H, 3/8" - 24H* | 63,27 | 65       | 72       | 1                                                                                     |
| 1,50 - 13,00 | 40      | B16                                                                                 | 1/2" - 20H              | 72,60 | 83       | 91       | 1                                                                                     |
| 3,00 - 16,00 | 53      | B16,B18                                                                             | 1/2" - 20H, 5/8" - 24H* | 95,89 | 96       | 109      | 1                                                                                     |

\* (Hasta fin de existencias / Jusqu'à épuisement des stocks / While supplies last)

**6122** > **Afilador de Brocas / Affûteuses forets / Twist Drill Sharpener**

- > Para Brocas HSS, HSSE, HSS+TIN, HM  
 Pour Forets HSS, HSSE, HSS+TIN, HM  
 For Drill-bits HSS, HSSE, HS+TIN, HM
- > Para ángulo normal afilado en cruz  
 Pour angle normal et affûtage en croix  
 For normal angle and Splint point
- > Ángulo de punta de 118°  
 Angle de la point e 118°  
 Point angle of 118°

| Ø<br>mm | €      |  |
|---------|--------|-----------------------------------------------------------------------------------|
| 3 a 13  | 159,34 | 1                                                                                 |



**6123** > **Porta / Mandrins / Chuck**

| €    |  |
|------|-------------------------------------------------------------------------------------|
| 9,65 | 1                                                                                   |



**6124** > **Muela / Meule / Wheel**

| €     |  |
|-------|-------------------------------------------------------------------------------------|
| 20,48 | 1                                                                                   |





**1171** **Ø 1 a 10 X 0,5 mm**

|                   |                 |                                                                                           |                   |
|-------------------|-----------------|-------------------------------------------------------------------------------------------|-------------------|
| Ø<br>mm<br>1 a 10 | X<br>mm<br>0,50 | <br>19 | DIN<br><b>338</b> |
|-------------------|-----------------|-------------------------------------------------------------------------------------------|-------------------|

>HSS  
(1101)



>SPEED PLUS  
(1158)



>HSS CO  
(1105)



>HSS CO INOX  
(1106)



>HSS TIN  
(1108)



| REF.             | €      |
|------------------|--------|
| HSS              | 46,83  |
| SPEED PLUS       | 51,35  |
| HSS CO           | 77,16  |
| HSS CO INOX      | 158,38 |
| HSS TIN          | 95,71  |
| VACIO/VIDE/EMPTY | 12,40  |

**1172** **Ø 1 a 13 X 0,5 mm**

|                   |                 |                                                                                           |                   |
|-------------------|-----------------|-------------------------------------------------------------------------------------------|-------------------|
| Ø<br>mm<br>1 a 13 | X<br>mm<br>0,50 | <br>25 | DIN<br><b>338</b> |
|-------------------|-----------------|-------------------------------------------------------------------------------------------|-------------------|

>HSS  
(1101)



>SPEED PLUS  
(1158)



>HSS CO  
(1105)



>HSS CO INOX  
(1106)



>HSS TIN  
(1108)



| REF.             | €      |
|------------------|--------|
| HSS              | 91,62  |
| SPEED PLUS       | 100,80 |
| HSS CO           | 176,68 |
| HSS CO INOX      | 318,43 |
| HSS TIN          | 199,10 |
| VACIO/VIDE/EMPTY | 16,54  |

**1143** **Ø 1 a 10 X 0,25 mm**

|                   |                 |                                                                                             |                   |
|-------------------|-----------------|---------------------------------------------------------------------------------------------|-------------------|
| Ø<br>mm<br>1 a 10 | X<br>mm<br>0,25 | <br>37 | DIN<br><b>338</b> |
|-------------------|-----------------|---------------------------------------------------------------------------------------------|-------------------|

>HSS  
(1101)



>HSS CO  
(1105)



| REF.             | €      |
|------------------|--------|
| HSS              | 128,75 |
| HSS CO           | 190,05 |
| VACIO/VIDE/EMPTY | 41,91  |

**1144** **Ø 6 a 10 X 0,10 mm**

| Ø<br>mm | X<br>mm |  | DIN        |
|---------|---------|-------------------------------------------------------------------------------------|------------|
| 6 a 10  | 0,10    | 41                                                                                  | <b>338</b> |

>HSS  
(1101)



>HSS CO  
(1105)



| REF.             | €      |
|------------------|--------|
| HSS              | 241,98 |
| HSS CO           | 346,46 |
| VACIO/VIDE/EMPTY | 72,53  |

**1145** **Ø 1 a 13 X 0,25 mm**

| Ø<br>mm | X<br>mm |  | DIN        |
|---------|---------|-------------------------------------------------------------------------------------|------------|
| 1 a 13  | 0,25    | 49                                                                                  | <b>338</b> |

>HSS  
(1101)



>HSS CO  
(1105)



| REF.             | €      |
|------------------|--------|
| HSS              | 224,07 |
| HSS CO           | 415,61 |
| VACIO/VIDE/EMPTY | 43,52  |

**1146** **Ø 1 a 6 X 0,10 mm**

| Ø<br>mm | X<br>mm |  | DIN        |
|---------|---------|---------------------------------------------------------------------------------------|------------|
| 1 a 6   | 0,10    | 51                                                                                    | <b>338</b> |

>HSS  
(1101)



>HSS CO  
(1105)



| REF.             | €      |
|------------------|--------|
| HSS              | 98,36  |
| HSS CO           | 139,66 |
| VACIO/VIDE/EMPTY | 29,01  |

1173

1/16" a 3/8" X 1/64"

  
21

DIN  
338

>HSS  
(1158/9)



>HSS CO  
(1105/9)



| REF.       | €      |
|------------|--------|
| SPEED PLUS | 74,95  |
| HSS CO     | 103,12 |

1174

1/16" a 1/2" X 1/64"

  
29

DIN  
338

>SPEED PLUS  
(1158/9)



>HSS CO  
(1105/9)



| REF.       | €      |
|------------|--------|
| SPEED PLUS | 136,17 |
| HSS CO     | 227,39 |

**1150** **Ø 1 a 10 X 0,5 mm**

Ø  
mm  
1 a 10

X  
mm  
0,50

DIN  
**338**

>HSS  
(1101)

>HSS NSP  
(1158)

>HSS CO  
(1105)

>HSS TIN  
(1108)



| REF.             | €      |
|------------------|--------|
| HSS              | 542,13 |
| HSS NSP          | 581,77 |
| HSS CO           | 473,88 |
| HSS TIN          | 604,95 |
| VACIO/VIDE/EMPTY | 72,53  |

| Ø<br>mm | HSS | HSS NSP | HSS CO | HSS TIN |
|---------|-----|---------|--------|---------|
| 1,00    | 20  | 20      | 10     | 10      |
| 1,50    | 10  | 10      | 5      | 5       |
| 2,00    | 20  | 20      | 10     | 10      |
| 2,50    | 10  | 10      | 5      | 5       |
| 3,00    | 20  | 20      | 10     | 10      |
| 3,50    | 10  | 10      | 5      | 5       |
| 4,00    | 20  | 20      | 10     | 10      |
| 4,50    | 10  | 10      | 5      | 5       |
| 5,00    | 20  | 20      | 10     | 10      |
| 5,50    | 10  | 10      | 5      | 5       |

| Ø<br>mm | HSS | HSS NSP | HSS CO | HSS TIN |
|---------|-----|---------|--------|---------|
| 6,00    | 20  | 20      | 10     | 10      |
| 6,50    | 10  | 10      | 5      | 5       |
| 7,00    | 10  | 10      | 5      | 5       |
| 7,50    | 10  | 10      | 5      | 5       |
| 8,00    | 10  | 10      | 5      | 5       |
| 8,50    | 10  | 10      | 5      | 5       |
| 9,00    | 10  | 10      | 5      | 5       |
| 9,50    | 10  | 10      | 5      | 5       |
| 10,00   | 10  | 10      | 5      | 5       |
| TOTAL   | 250 | 250     | 125    | 125     |

**1183** **Ø 1 a 13 X 0,5 mm**

Ø  
mm  
1 a 10

X  
mm  
0,50

DIN  
**338**

>HSS  
(1101)

>HSS NSP  
(1158)

>HSS CO  
(1105)

>HSS TIN  
(1108)



| REF.             | €        |
|------------------|----------|
| HSS              | 838,02   |
| HSS NSP          | 900,99   |
| HSS CO           | 1.043,37 |
| HSS TIN          | 1.193,83 |
| VACIO/VIDE/EMPTY | 145,07   |

| Ø<br>mm | HSS | HSS NSP | HSS CO | HSS TIN |
|---------|-----|---------|--------|---------|
| 1,00    | 20  | 20      | 10     | 10      |
| 1,50    | 10  | 10      | 5      | 5       |
| 2,00    | 20  | 20      | 10     | 10      |
| 2,50    | 10  | 10      | 5      | 5       |
| 3,00    | 20  | 20      | 10     | 10      |
| 3,50    | 10  | 10      | 5      | 5       |
| 4,00    | 20  | 20      | 10     | 10      |
| 4,50    | 10  | 10      | 5      | 5       |
| 5,00    | 20  | 20      | 10     | 10      |
| 5,50    | 10  | 10      | 5      | 5       |
| 6,00    | 20  | 20      | 10     | 10      |
| 6,50    | 10  | 10      | 5      | 5       |
| 7,00    | 10  | 10      | 5      | 5       |

| Ø<br>mm | HSS | HSS NSP | HSS CO | HSS TIN |
|---------|-----|---------|--------|---------|
| 7,50    | 10  | 10      | 5      | 5       |
| 8,00    | 10  | 10      | 5      | 5       |
| 8,50    | 10  | 10      | 5      | 5       |
| 9,00    | 10  | 10      | 5      | 5       |
| 9,50    | 10  | 10      | 5      | 5       |
| 10,00   | 10  | 10      | 5      | 5       |
| 10,50   | 5   | 5       | 5      | 5       |
| 11,00   | 5   | 5       | 5      | 5       |
| 11,50   | 5   | 5       | 5      | 5       |
| 12,00   | 5   | 5       | 5      | 5       |
| 12,50   | 5   | 5       | 5      | 5       |
| 13,00   | 5   | 5       | 5      | 5       |
| TOTAL   | 280 | 280     | 155    | 155     |



**8201** » Ø 1 a 13 mm

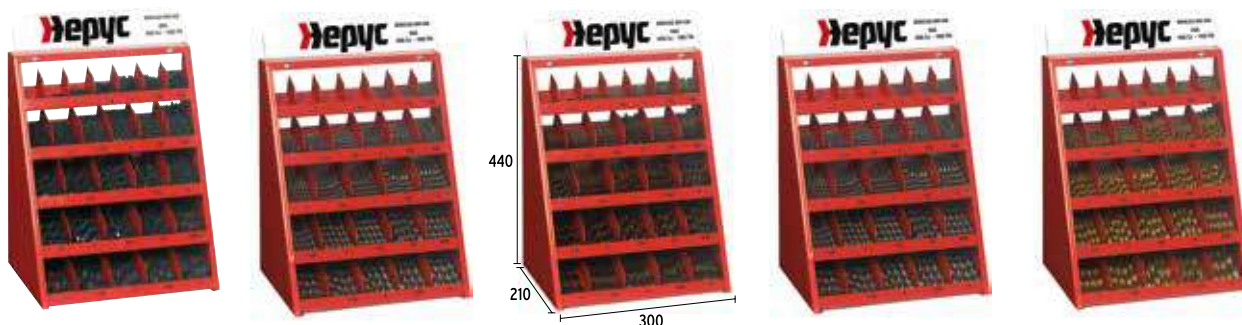
>HSS DIN 338 N  
(1101)

>HSS DIN 338 NSP  
(1158)

>HSSCO DIN 338 N  
(1105)

>HSSCO DIN 338 W  
(1106)

>HSSTIN DIN 338 N  
(1108)



| Ø<br>mm | HSS<br>DIN 338 N | HSS DIN<br>338 NSP | HSSCO<br>DIN 338 N | HSSCO<br>DIN 338 W | HSSTIN<br>DIN 338 N |
|---------|------------------|--------------------|--------------------|--------------------|---------------------|
| 1,00    | 20               | 20                 | 20                 | -                  | 20                  |
| 1,50    | 20               | 20                 | 10                 | -                  | 10                  |
| 2,00    | 50               | 50                 | 20                 | -                  | 20                  |
| 2,25    | 20               | 20                 | 20                 | -                  | 10                  |
| 2,50    | 40               | 40                 | 20                 | -                  | 10                  |
| 3,00    | 50               | 50                 | 20                 | -                  | 20                  |
| 3,25    | 30               | 30                 | 20                 | 10                 | 10                  |
| 3,50    | 40               | 40                 | 20                 | 10                 | 20                  |
| 4,00    | 50               | 50                 | 30                 | 10                 | 30                  |
| 4,25    | 30               | 30                 | 20                 | 10                 | 10                  |
| 4,50    | 40               | 40                 | 20                 | 10                 | 10                  |
| 5,00    | 50               | 50                 | 30                 | 10                 | 30                  |
| 5,25    | 20               | 20                 | 10                 | 10                 | 10                  |
| 5,50    | 30               | 30                 | 20                 | 10                 | 20                  |
| 6,00    | 50               | 50                 | 30                 | 10                 | 20                  |

| Ø<br>mm | HSS<br>DIN 338 N | HSS DIN<br>338 NSP | HSSCO<br>DIN 338 N | HSSCO<br>DIN 338 W | HSSTIN<br>DIN 338 N |
|---------|------------------|--------------------|--------------------|--------------------|---------------------|
| 6,50    | 20               | 20                 | 10                 | 10                 | 10                  |
| 7,00    | 20               | 20                 | 10                 | 10                 | 10                  |
| 7,50    | 10               | 10                 | 10                 | 10                 | 10                  |
| 8,00    | 40               | 40                 | 20                 | 10                 | 10                  |
| 8,50    | 20               | 20                 | 10                 | 10                 | 10                  |
| 9,00    | 20               | 20                 | 10                 | 10                 | 10                  |
| 9,50    | 10               | 10                 | 10                 | 10                 | 10                  |
| 10,00   | 20               | 20                 | 10                 | 10                 | 10                  |
| 10,50   | 5                | 5                  | 5                  | 5                  | 5                   |
| 11,00   | 5                | 5                  | 5                  | 5                  | 5                   |
| 11,50   | 5                | 5                  | 5                  | 5                  | 5                   |
| 12,00   | 10               | 10                 | 5                  | 5                  | 5                   |
| 12,50   | 5                | 5                  | 5                  | 5                  | 5                   |
| 13,00   | 5                | 5                  | 5                  | 5                  | 5                   |
| TOTAL   | 735              | 735                | 430                | 200                | 360                 |
| €       | 1.432,31         | 1.565,60           | 1.702,26           | 2.226,32           | 1.795,55            |

**8201/9** **1/16" a 1/2" x 1/64"**

>HSS DIN 338 NSP  
(1158/9)



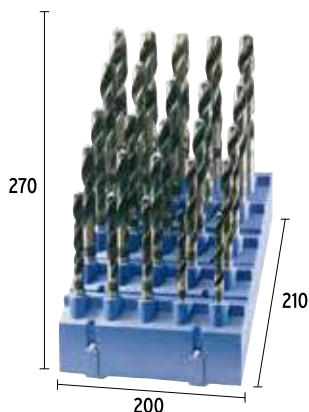
>HSSCO DIN 338 N  
(1105/9)



|  | Ø<br>mm |  HSS DIN 338 NSP |  HSSCO DIN 338 N |
|--|---------|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
|  | 1/16"   | 20                                                                                                | 20                                                                                                |
|  | 5/64"   | 20                                                                                                | 10                                                                                                |
|  | 3/32"   | 50                                                                                                | 20                                                                                                |
|  | 7/64"   | 20                                                                                                | 20                                                                                                |
|  | 1/8"    | 40                                                                                                | 20                                                                                                |
|  | 9/64"   | 50                                                                                                | 20                                                                                                |
|  | 5/32"   | 30                                                                                                | 20                                                                                                |
|  | 11/64"  | 40                                                                                                | 20                                                                                                |
|  | 3/16"   | 50                                                                                                | 30                                                                                                |
|  | 13/64"  | 30                                                                                                | 20                                                                                                |
|  | 7/32"   | 40                                                                                                | 20                                                                                                |
|  | 15/64"  | 50                                                                                                | 30                                                                                                |
|  | 1/4"    | 20                                                                                                | 10                                                                                                |
|  | 17/64"  | 30                                                                                                | 20                                                                                                |
|  | 9/32"   | 50                                                                                                | 30                                                                                                |

|  | Ø<br>mm |  HSS DIN 338 NSP |  HSSCO DIN 338 N |
|--|---------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|  | 19/64"  | 20                                                                                                  | 10                                                                                                  |
|  | 5/16"   | 20                                                                                                  | 10                                                                                                  |
|  | 21/64"  | 10                                                                                                  | 10                                                                                                  |
|  | 11/32"  | 40                                                                                                  | 20                                                                                                  |
|  | 23/64"  | 20                                                                                                  | 10                                                                                                  |
|  | 3/8"    | 20                                                                                                  | 10                                                                                                  |
|  | 25/64"  | 10                                                                                                  | 10                                                                                                  |
|  | 13/32"  | 20                                                                                                  | 10                                                                                                  |
|  | 27/64"  | 5                                                                                                   | 5                                                                                                   |
|  | 7/16"   | 5                                                                                                   | 5                                                                                                   |
|  | 29/64"  | 5                                                                                                   | 5                                                                                                   |
|  | 15/32"  | 10                                                                                                  | 5                                                                                                   |
|  | 31/64"  | 5                                                                                                   | 5                                                                                                   |
|  | 1/2"    | 5                                                                                                   | 5                                                                                                   |
|  | TOTAL   | 735                                                                                                 | 430                                                                                                 |
|  | €       | 1.855,61                                                                                            | 1.991,75                                                                                            |

## 8203 Ø 14 a 30 mm (Ref. 1121)



| Ø<br>mm |   | Ø<br>mm |   | Ø<br>mm |         |
|---------|---|---------|---|---------|---------|
| 14,00   | 1 | 18,50   | 1 | 23,00   | 1       |
| 14,50   | 1 | 19,00   | 1 | 24,00   | 1       |
| 15,00   | 1 | 19,50   | 1 | 25,00   | 1       |
| 15,50   | 1 | 20,00   | 1 | 26,00   | 1       |
| 16,00   | 1 | 20,50   | 1 | 27,00   | 1       |
| 16,50   | 1 | 21,00   | 1 | 28,00   | 1       |
| 17,00   | 1 | 21,50   | 1 | 30,00   | 1       |
| 17,50   | 1 | 22,00   | 1 |         |         |
| 18,00   | 1 | 22,50   | 1 |         |         |
|         |   |         |   | TOTAL   | 25      |
|         |   |         |   | €       | 1296,38 |

## 8207 Ø 1 a 16 mm

>HSS DIN 338 N  
(1101)

>HSS DIN 338 NSP  
(1158)

>HSSCO DIN 338 N  
(1105)

>HSSCO DIN 338 W  
(1187)

>HSSTIN DIN 338 N  
(1108)



| Ø<br>mm | HSS<br>DIN 338 N | HSS<br>DIN 338 NSP | HSSCO<br>DIN 338 N | HSSCO<br>DIN 338 W | HSSTIN<br>DIN 338 N |
|---------|------------------|--------------------|--------------------|--------------------|---------------------|
| 1,00    | 40               | 40                 | 40                 | 40                 | 40                  |
| 1,50    | 20               | 20                 | 20                 | 20                 | 20                  |
| 2,00    | 40               | 40                 | 40                 | 40                 | 40                  |
| 2,25    | 40               | 40                 | 40                 | 40                 | 40                  |
| 2,50    | 40               | 40                 | 40                 | 40                 | 40                  |
| 3,00    | 60               | 60                 | 60                 | 60                 | 60                  |
| 3,25    | 40               | 40                 | 40                 | 40                 | 40                  |
| 3,50    | 40               | 40                 | 40                 | 40                 | 40                  |
| 4,00    | 60               | 60                 | 60                 | 60                 | 60                  |
| 4,25    | 40               | 40                 | 40                 | 40                 | 40                  |
| 4,50    | 40               | 40                 | 40                 | 40                 | 40                  |
| 5,00    | 60               | 60                 | 60                 | 60                 | 60                  |
| 5,50    | 40               | 40                 | 40                 | 40                 | 40                  |
| 6,00    | 60               | 60                 | 60                 | 60                 | 60                  |

| Ø<br>mm | HSS<br>DIN 338 N | HSS<br>DIN 338 NSP | HSSCO<br>DIN 338 N | HSSCO<br>DIN 338 W | HSSTIN<br>DIN 338 N |
|---------|------------------|--------------------|--------------------|--------------------|---------------------|
| 6,50    | 20               | 20                 | 20                 | 20                 | 20                  |
| 7,00    | 20               | 20                 | 20                 | 20                 | 20                  |
| 7,50    | 20               | 20                 | 20                 | 20                 | 20                  |
| 8,00    | 30               | 30                 | 30                 | 30                 | 30                  |
| 8,50    | 20               | 20                 | 20                 | 20                 | 20                  |
| 9,00    | 20               | 20                 | 20                 | 20                 | 20                  |
| 10,00   | 20               | 20                 | 20                 | 20                 | 20                  |
| 11,00   | 10               | 10                 | 10                 | 10                 | 10                  |
| 12,00   | 10               | 10                 | 10                 | 10                 | 10                  |
| 13,00   | 5                | 5                  | 5                  | 5                  | 5                   |
| TOTAL   | 795              | 795                | 795                | 795                | 795                 |
| €       | 1.396,74         | 1.526,75           | 2.551,23           | 3.918,85           | 3.145,28            |