

HAUPTKATALOG

MAIN CATALOGUE
CATALOGUE PRINCIPAL
CATALOGO GENERALE

Sonderwerkzeuge / Special tools / Outils spéciaux / Attrezzi speciali




Sie benötigen ein Werkzeug für Sonderabmessungen oder speziell für Ihre Anforderungen angepasst?
Für Ihre kundenspezifische Lösung fertigen wir selbst kleinste Losgrößen und Sonderanfertigungen in kürzest möglicher Zeit.

You need a tool for special sizes or specially adapted for your needs?
For your customized solution, we even produce the smallest lot sizes and special designs in the shortest possible time.
















Vous avez besoin d'un outil spécial, aux dimensions particulières ou adapté a vos exigences spécifiques ?
Notre production est capable de produire des petites séries pour répondre à vos besoins dans les plus brefs délais.

Avete bisogno di utensili speciali a disegno?
Siamo in grado di produrre in tempi brevi qualsiasi tipo di utensile abbiate bisogno.

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**Gewindewerkzeuge / Threading tools /
Outils de filetage / Utensili di filettatura**



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|--|-----|--|-----|--|-----|--|-----|--|-----|
| 181 000 | 185 | 371 053 | 103 | 374 100 | 117 | 376 053 | 103 | 520 403 | 150 |
| | | 371 100 | 70 | 374 103 | 122 | 376 100 | 70 | 520 703 | 150 |
| 223 000 | 190 | 371 103 | 91 | 374 106 | 118 | 376 103 | 91 | 900 140 | 176 |
| 223 003 | 190 | 371 105 | 96 | 374 150 | 120 | 376 105 | 96 | 900 141 | 176 |
| 223 008 | 190 | 371 106 | 73 | 374 163 | 123 | 376 106 | 73 | 900 410 | 177 |
| 223 100 | 191 | 371 107 | 68 | 374 190 | 118 | 376 107 | 68 | 900 440 | 177 |
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| 223 500 | 193 | 371 143 | 93 | 374 241 | 126 | 376 143 | 93 | 530 403 | 151 |
| | | 371 150 | 78 | 374 300 | 120 | 376 150 | 78 | 530 703 | 151 |
| 352 000 | 181 | 371 151 | 75 | 374 303 | 124 | 376 151 | 75 | 571 103 | 166 |
| 352 003 | 183 | 371 153 | 98 | 374 306 | 121 | 376 153 | 98 | 571 104 | 155 |
| 352 008 | 182 | 371 163 | 94 | 374 343 | 124 | 376 163 | 94 | 571 109 | 168 |
| 352 503 | 184 | 371 164 | 95 | 374 363 | 125 | 376 164 | 95 | 571 109 | 168 |
| | | 371 170 | 74 | 374 364 | 125 | 376 170 | 74 | 571 119 | 169 |
| 353 000 | 187 | 371 190 | 71 | 374 390 | 121 | 376 190 | 71 | 571 143 | 152 |
| | | 371 193 | 92 | 374 504 | 202 | 376 193 | 92 | 571 153 | 167 |
| 357 000 | 85 | 371 200 | 76 | 374 604 | 203 | 376 200 | 76 | 571 154 | 156 |
| 357 151 | 85 | 371 201 | 114 | 374 754 | 202 | 376 201 | 114 | 571 278 | 159 |
| | | 371 203 | 97 | 374 891 | 209 | 376 203 | 97 | 571 281 | 157 |
| | | 371 204 | 197 | | | 376 204 | 197 | 571 288 | 161 |
| | | 371 241 | 116 | | | 376 241 | 116 | 571 343 | 153 |
| | | 371 300 | 79 | | | 376 300 | 79 | 571 347 | 154 |
| | | 371 303 | 100 | | | 376 303 | 100 | 571 381 | 158 |
| | | 371 305 | 109 | | | 376 305 | 109 | 571 387 | 160 |
| | | 371 306 | 83 | | | 376 306 | 83 | 571 403 | 139 |
| | | 371 307 | 69 | | | 376 307 | 69 | 571 403 | 139 |
| | | 371 308 | 82 | | | 376 308 | 82 | 571 437 | 140 |
| | | 371 313 | 101 | | | 376 313 | 101 | 571 463 | 141 |
| | | 371 320 | 80 | | | 376 320 | 80 | 571 603 | 146 |
| | | 371 323 | 102 | | | 376 323 | 102 | 571 703 | 142 |
| | | 371 343 | 106 | | | 376 343 | 106 | 571 723 | 144 |
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| | | 371 364 | 108 | | | 376 364 | 108 | 571 763 | 145 |
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| | | 371 400 | 113 | | | 376 400 | 113 | 574 281 | 162 |
| | | 371 504 | 195 | | | 376 504 | 195 | 574 288 | 164 |
| | | 371 564 | 199 | | | 376 564 | 199 | 574 403 | 147 |
| | | 371 574 | 200 | | | 376 574 | 200 | 574 437 | 148 |
| | | 371 604 | 198 | | | 376 604 | 198 | 574 703 | 147 |
| | | 371 700 | 77 | | | 376 700 | 77 | 574 737 | 148 |
| | | 371 754 | 196 | | | 376 754 | 196 | 574 737 | 148 |
| | | 371 791 | 206 | | | 376 791 | 206 | 576 103 | 166 |
| | | 371 792 | 208 | | | 376 891 | 205 | 576 104 | 155 |
| | | 371 801 | 90 | | | 376 892 | 207 | 576 109 | 168 |
| | | 371 803 | 99 | | | | | 576 119 | 169 |
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| | | | | | | | | 921 303 | 134 |
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| | | | | | | | | 930 100 | 135 |
| | | | | | | | | 930 103 | 136 |
| | | | | | | | | 930 300 | 135 |
| | | | | | | | | 930 303 | 136 |
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| | | | | | | | | 957 504 | 201 |
| | | | | | | | | 970 053 | 67 |
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| | | | | | | | | 970 150 | 66 |
| | | | | | | | | 970 300 | 67 |
| | | | | | | | | 980 100 | 127 |
| | | | | | | | | 980 103 | 129 |
| | | | | | | | | 980 150 | 128 |
| | | | | | | | | 980 200 | 127 |
| | | | | | | | | 980 201 | 130 |
| | | | | | | | | 980 300 | 128 |
| | | | | | | | | 980 303 | 129 |
| | | | | | | | | 980 504 | 203 |
| | | | | | | | | 980 891 | 210 |
| | | | | | | | | 990 050 | 178 |





Zur Beschreibung Ihres Bearbeitungsfalles benötigen Sie:

- ▶ Die Bezeichnung Ihres Werkstoffes
- ▶ Die Art und Größe des gewünschten Gewindes
- ▶ Die Bohrungsart (Durchgangsloch, Sackloch) und die Gewindetiefe

Mit diesen Angaben führen Sie die Auswahlsschritte 1 bis 5 zu dem gewünschten Werkzeug.

Beispiel: GG-40 (0.6040); Grundlochgewinde M10 – ISO2 (6H); Tiefe = 20 mm (2 x d)

To describe your machining process you need:

- ▶ The material to be machined
- ▶ Type and size of the desired thread
- ▶ Type of hole (through or blind) and depth of thread

With these details, follow selection steps 1 to 5 to the desired tool.

Example: GJL-400; blind hole thread M10 – ISO2 (6H); depth = 20 mm (2 x d)

1

Ordnen Sie Ihr Material einer Werkstoffgruppe/Anwendungstabelle zu:
Werkstoffübersichten finden Sie von Seite 12 bis Seite 15.

Beispiel: Sie finden den Werkstoff „GG-40 (0.6040)“ in der Werkstoffübersicht auf Seite 14 unter der Werkstoffgruppe 2.2.

Assign your material to a material group/an application table:
You will find a material overview on pages 16 to 17.

Example: You will find the material “GJL-400” in the material overview on page 16 under material group 2.2.

2

Aus der Werkstoffgruppenübersicht von Seite 12 bis Seite 15 entnehmen Sie die Seite der Anwendungstabelle.

Beispiel: In der Werkstoffübersicht Seite 14 entnehmen Sie Seite 30–31 für die Anwendungstabelle der Werkstoffgruppe 2.2.

Please see the material overview on pages 16 to 17 for the page number of the application table.

Example: The material overview on page 16 shows you pages 30–31 for the application table of material group 2.2

| DIN (DE) | W-Nr. | MAT | |
|--------------------|-----------|-------|-------|
| - | 2.4374 LN | 6.2 | 42-43 |
| - | 2.4662 | 6.3 | 44-45 |
| - | 2.4812 | 6.2 | 42-43 |
| GG-15 | 0.6015 | 2.1 | 30-31 |
| GG-20 | 0.6020 | 2.1 | 30-31 |
| GG-25 | 0.6025 | 2.1 | 30-31 |
| GG-30 | 0.6030 | 2.2 | 30-31 |
| GG-35 | 0.6035 | 2.2 | 30-31 |
| GG-40 | 0.6040 | 2.2 | 30-31 |
| GGG-35.3 | 0.7033 | 2.3 | 30-31 |
| GGG-40 | 0.7040 | 2.3 | 30-31 |
| GGG-40.3 | 0.7043 | 2.3 | 30-31 |
| GGG-50 | 0.7050 | 2.3 | 30-31 |
| GGG-60 | 0.7060 | 2.3 | 30-31 |
| GGV-30 | - | 2.4 | 30-31 |
| GGV-40 | - | 2.4 | 30-31 |
| G-MgAg 3 SE 2 Zr 1 | 3.5106 | 4.4 | 30-31 |
| G-MgAl 6 | 3.5562 | 4.4 | 30-31 |
| GS-15 CrNi 6 | 1.5919 | 1.3.5 | 22-23 |
| GS-18 CrMo 9 10 | 1.7379 | 1.3.5 | 22-23 |

| EN (EU) | DIN (DE) | MAT | |
|-------------|-----------|-------|-------|
| 1 C 22 | C 22 | 1.2.2 | 22-23 |
| 1 C 30 | C 30 | 1.2.2 | 22-23 |
| 1 C 35 | C 35 | 1.2.2 | 22-23 |
| GJL-150 | GG-15 | 2.1 | 30-31 |
| GJL-200 | GG-20 | 2.1 | 30-31 |
| GJL-250 | GG-25 | 2.1 | 30-31 |
| GJL-300 | GG-30 | 2.2 | 30-31 |
| GJL-350 | GG-35 | 2.2 | 30-31 |
| GJL-400 | GG-40 | 2.2 | 30-31 |
| GJMB-350-10 | GTS-35-10 | 2.3 | 30-31 |
| GJMB-450-6 | GTS-45-06 | 2.3 | 30-31 |
| GJMB-550-4 | GTS-55-04 | 2.3 | 30-31 |
| GJMB-650-2 | GTS-65-02 | 2.3 | 30-31 |
| GJMW-350-4 | GTW-35-04 | 2.3 | 30-31 |
| GJMW-400-5 | GTW-40-05 | 2.3 | 30-31 |
| GJMW-450-7 | GTW-45-07 | 2.3 | 30-31 |
| GJS-350-22 | GGG-35.3 | 2.3 | 30-31 |
| GJS-400-15 | GGG-40 | 2.3 | 30-31 |
| GJS-400-18 | GGG-40.3 | 2.3 | 30-31 |
| GJS-500-7 | GGG-50 | 2.3 | 30-31 |



3

Legen Sie die benötigte Gewindeart in der Anwendungstabelle fest.

Beispiel: In der Anwendungstabelle Seite 30 finden Sie die Gewindebohrer-/Gewindeformerausführung „DIN371 – ISO2 (6H)“.

Select the required type of thread from the application table.

Example: In the application table on page 30 you will find the type of thread “M” and the machine tap or forming tap version “DIN371 – ISO2 (6H)”.

4

Legen Sie die Bohrungsart in der Anwendungstabelle fest.

Beispiel: In der Anwendungstabelle Seite 30 finden Sie Ihre Bohrungsart (max. 2 x d).

Select the type of hole from the application table.

Example: In the application table on page 30 you will find the type of hole you require (max. 2 x d).

5

Lesen Sie jetzt unter Werkstoffgruppe/Bohrungsart/Gewindeart die Katalognr., die Katalogseite und die Schnittgeschwindigkeit Vc des empfohlenen Werkzeuges ab.

Das am besten geeignete Werkzeug steht in der Tabelle ganz oben.

Beispiel: Alle Katalognummern in der Auswahl sind für Ihren Anwendungsfall geeignet. Das am besten geeignete Werkzeug steht in der Auswahl ganz oben und hat die Katalognr. 371 241. Sie finden die Katalognummer auf Seite 116.

Now look up the catalogue number, page and cutting speed Vc of the recommended tool under material group/type of hole/type of thread.

The most suitable tool is at the top of the table.

Example: All catalogue numbers from the selection are suitable for your application. The most suitable tool is at the top of the table, which is catalogue no. 371 241. You will find this catalogue number on page 116.

| Vc | M | | | DIN 352 | | ISO 2 6H | | ISO 1 4H | | ISO 2 6H | |
|-------|--------|--------|------|---------|--|----------|----|----------|--|----------|-----|
| | ≤1,5xd | ≤2,5xd | ≤3xd | | | | | | | | |
| | | | | | | | | | | | |
| 22~26 | 18~22 | | | | | | | | | 371241 | 116 |
| 18~22 | 15~18 | | | | | | | | | 371291 | 115 |
| 15~18 | 12~15 | | | | | | | | | 371201 | 114 |
| 26~32 | 22~26 | 18~22 | | | | | | | | 571104 | 155 |
| 22~26 | 18~22 | 15~18 | | | | | | | | 571437 | 140 |
| 22~26 | 18~22 | 15~18 | | | | | | | | 571403 | 139 |
| 22~26 | 18~22 | 15~18 | | | | | | | | 571143 | 152 |
| | 175 | | | | | | | | | 900140* | 176 |
| | | | | | | | | | | 900141* | 176 |
| 18~22 | 15~18 | 12~15 | | | | | | | | 371143 | 93 |
| 12~15 | 10~12 | | | | | | | | | 371203 | 97 |
| 12~15 | 10~12 | 8~10 | | | | 371801 | 90 | | | 371103 | 91 |
| 12~15 | 10~12 | 8~10 | | | | | | | | | |
| 22~26 | 18~22 | | | | | | | | | 371241 | 116 |
| 18~22 | 15~18 | | | | | | | | | 371291 | 115 |
| 15~18 | 12~15 | | | | | | | | | 371201 | 114 |
| 22~26 | 18~22 | 15~18 | | | | | | | | 571154 | 156 |
| 18~22 | 15~18 | 12~15 | | | | | | | | 571603 | 146 |
| 18~22 | 15~18 | 12~15 | | | | | | | | 571737 | 143 |
| 18~22 | 15~18 | 12~15 | | | | | | | | 571347 | 154 |
| 18~22 | 15~18 | 12~15 | | | | | | | | 571343 | 153 |
| 18~22 | 15~18 | 12~15 | | | | | | | | 571703 | 142 |
| 18~22 | 15~18 | 12~15 | | | | | | | | 571343 | 153 |
| | 175 | | | | | | | | | 900447* | 177 |
| | | | | | | | | | | 900440* | 177 |

371 241 / 116
v_c = 18~22 m/min

Probleme? · Any problems?

Wir helfen gern weiter:
We will be happy to assist you:

06172/106-206

Pour décrire votre cas d'usinage, vous avez besoin :

- ▶ De la désignation matière
- ▶ Du type et de la taille du filet souhaité
- ▶ Du type de trou (trou traversant, trou borgne) et de la profondeur du filetage

Avec ces informations, vous pouvez effectuer les étapes 1 à 5 pour sélectionner l'outil souhaité.

Exemple : Ft40 D ; trou borgne M10 – ISO2 (6H) ; profondeur = 20 mm (2x d)

Per la descrizione della vostra lavorazione avrete bisogno:

- ▶ Della designazione del materiale di lavorazione
- ▶ Del tipo e delle dimensioni del filetto richiesto
- ▶ Del tipo di foro (foro passante, foro cieco) e della profondità del filetto

Con questi dati, seguendo la selezione da 1 a 5, otterrete l'utensile desiderato.

Esempio: G 40; filetto foro cieco M10 – ISO2 (6H); profondità = 20 mm (2x d)

1

Assignez votre matière à un groupe de matériaux/tableau d'application : vous trouverez les vues d'ensemble des matières aux pages 18 à 19.

Exemple : Matière «Ft40 D» dans la vue d'ensemble de la page 19, groupe de matériaux 2.2.

Assegnare il materiale a un gruppo di materiali di lavorazione/tabella applicazione: troverete un riepilogo dei materiali di lavorazione da pagina 20.

Esempio: troverete il materiale di lavorazione «G 40» nel riepilogo materiali a pagina 20 nel gruppo materiali di lavorazione 2.2.

2

Vous trouverez la page du tableau d'application dans la vue d'ensemble des groupes de matières pages 18 à 19.

Exemple : dans la vue d'ensemble des matières de la page 19, vous trouvez les pages 30–31 pour le tableau d'application du groupe de matériaux 2.2.

Nel riepilogo gruppi di materiali di lavorazione da pagina 20 troverete la pagina della tabella applicazione.

Esempio: Nel riepilogo dei materiali di lavorazione di pagina 20 troverete la pagina 30–31 per la tabella applicazione del gruppo di materiali di lavorazione 2.2.

| NF A (FR) | EN (EU) | MAT | | UNI (IT) | EN (DE) | MAT | |
|---------------------|------------------|-------|-------|-----------------|------------|-------|-------|
| 10 F 1 | 10 S 20 | 1.2.3 | 22-23 | 100 Cr 6 | 100 Cr 6 | 1.4.2 | 24-25 |
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3

À l'aide du tableau d'application, déterminez le type de filet requis.

Exemple : vous trouvez, dans le tableau d'application page 30, le modèle de taraud coupant/à refouler «DIN371 – ISO2 (6H)».

Determinate il tipo di filetto richiesto nella tabella applicazione.

Esempio: Nella tabella applicazione di pagina 30 troverete l'esecuzione maschio a filettare/maschio a rullare «DIN371 – ISO2 (6H)».

4

À l'aide du tableau d'application, déterminez le type de trou.

Exemple : vous trouvez, dans le tableau d'application page 30, votre type de trou (2x d max.).

Determinate il tipo di foro richiesto nella tabella applicazione.

Esempio: Nella tabella applicazione di pagina 30 troverete il tipo di foro (max. 2x d).

5

Dans Groupe de matière/Type de trou/Type de filet, vous trouverez le n° de catalogue, la page du catalogue et la vitesse de coupe Vc de l'outil conseillé.

L'outil convenant le mieux se trouve tout en haut du tableau.

Exemple : tous les numéros de catalogue de la sélection sont appropriés à votre cas d'application. L'outil convenant le mieux se trouve tout en haut de la sélection et porte le n° de catalogue 371 241. Vous trouverez le numéro de catalogue à la page 116.

Trovate ora nel gruppo materiali/tipo di foro/tipo di filetto il n. di catalogo, la pagina di catalogo e la velocità di taglio Vc dell'utensile consigliato.

Troverete l'utensile più idoneo in alto nella tabella.

Esempio: Tutti i numeri di catalogo nella selezione sono idonei alla vostra applicazione. Troverete l'utensile più idoneo in alto nella selezione con il numero di catalogo 371 241. Troverete il numero di catalogo a pagina 116.

| Vc | M | | | DIN 352 | | | ISO 2 6H | | | ISO 1 4H | | | ISO 2 6H | | |
|-------|--------|--------|------|---------|--|--|----------|--------|----|----------|--|---------|----------|--|--|
| | ≤1,5xd | ≤2,5xd | ≤3xd | | | | | | | | | | | | |
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| | | | | | | | | | | | | 900440* | 177 | | |

371 241 / 116
v_c = 18~22 m/min

Des problèmes ? · Problemi?

Nous sommes là pour vous aider :
Saremo lieti di assistervi:

06172/106-206

Werkstoffübersicht nach Werkstoffnummer (W.-Nr.) DIN (DE)
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 Index-Groupe de matières selon numéro (W.-Nr.) DIN (DE)
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| - | AMPCO 15 | 3.4 | 36-37 |
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| 1.1554 | C 110 W | 1.5.1/8.2 | 24 + 44 |
| 1.1730 | C 45 W | 1.5.1/8.2 | 24 + 44 |
| 1.1740 | C 60 W | 1.5.1/8.2 | 24 + 44 |
| 1.1744 | C 67 W | 1.5.1/8.2 | 24 + 44 |
| 1.1820 | C 55 W | 1.5.1/8.2 | 24 + 44 |
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| 1.2083 | X 42Cr 13 | 1.5.4/8.2 | 26 + 44 |
| 1.2127 | 105 MnCr 4 | 1.5.2/8.2 | 24 + 44 |
| 1.2201 | X 165 CrV 12 | 1.5.2/8.2 | 24 + 44 |
| 1.2303 | 100 CrMo 5 | 1.5.2/8.2 | 24 + 44 |
| 1.2309 | 65 MnCrMo 4 | 1.5.5/8.2 | 26 + 44 |
| 1.2311 | 40 CrMnMo 7 | 1.5.5/8.2 | 26 + 44 |
| 1.2312 | 40 CrMnMoS 8 6 | 1.5.4/8.2 | 26 + 44 |
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| 1.2343 | X 38CrMoV 5 1 | 1.5.5/8.2 | 26 + 44 |
| 1.2344 | X 40 CrMoV 5 1 | 1.5.5/8.2 | 26 + 44 |
| 1.2363 | X 100 CrMoV 5 1 | 1.5.2/8.2 | 24 + 44 |
| 1.2367 | X 38 CrMoV 5 3 | 1.5.5/8.2 | 26 + 44 |
| 1.2379 | X155 CrMoV 12 1 | 1.5.2/8.2 | 24 + 44 |
| 1.2436 | X 210 CrW 12 | 1.5.2/8.2 | 24 + 44 |
| 1.2601 | X 165 CrMoV 12 | 1.5.2/8.2 | 24 + 44 |
| 1.2622 | X 60 WCrMoV 9 4 | 1.5.5/8.2 | 26 + 44 |
| 1.2678 | X 45 CrCoW 5 5 5 | 1.5.5/8.2 | 26 + 44 |
| 1.2731 | X 50 NiCrWV 13 13 | 1.5.5/8.2 | 26 + 44 |
| 1.2767 | X 45 NiCrMo 4 | 1.5.5/8.2 | 26 + 44 |
| 1.2842 | 90 MnCrV 8 | 1.5.2/8.2 | 24 + 44 |
| 1.2880 | X 165 CrCoMo 12 | 1.5.2/8.2 | 24 + 44 |
| 1.2884 | X 210 CrCoW 12 | 1.5.2/8.2 | 24 + 44 |
| 1.2889 | X 45 CoCrMoV 5 5 3 | 1.5.5/8.2 | 26 + 44 |
| 1.2889 | X 45 CoCrMoV 5 5 3 | 1.5.5/8.2 | 26 + 44 |
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| 1.3343 | S 6-5-2 | 1.5.3/8.2 | 24 + 44 |
| 1.3344 | S 6-5-3 | 1.5.3/8.2 | 24 + 44 |
| 1.3346 | S 2-9-1 | 1.5.3/8.2 | 24 + 44 |
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| 1.3503 | 105 Cr 4 (W2) | 1.4.2 | 24-25 |
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| 1.3956 | X 8 CrNi 18 12 | 1.6.2 | 28-29 |
| 1.4000 | X 6 Cr 13 | 1.6.3 | 28-29 |
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| 1.4005 | X 12 CrS 13 | 1.6.5/8.2 | 28 + 44 |
| 1.4006 | X 10 Cr 13 | 1.6.5/8.2 | 28 + 44 |
| 1.4008 | G-X 8 CrNi 13 | 1.6.3 | 28-29 |
| 1.4016 | X 6 Cr 17 | 1.6.3 | 28-29 |
| 1.4021 | X 20 Cr 13 | 1.6.5/8.2 | 28 + 44 |
| 1.4024 | X 15 Cr 13 | 1.6.5/8.2 | 28 + 44 |
| 1.4027 | G-X 20 Cr 14 | 1.6.3 | 28-29 |
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| 1.4034 | X 46 Cr 13 | 1.6.5/8.2 | 28 + 44 |
| 1.4057 | X 20 CrNi 17 2 | 1.6.5/8.2 | 28 + 44 |
| 1.4059 | G-X 22 CrNi 17 | 1.6.3 | 28-29 |
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| 1.4112 | X 90 CrMoV 18 | 1.6.5/8.2 | 28 + 44 |
| 1.4113 | X 6 CrMo 17 | 1.6.3 | 28-29 |
| 1.4116 | X 45 CrMoV 15 | 1.6.5/8.2 | 28 + 44 |
| 1.4138 | G-X 120 CrMo 29 2 | 1.6.5/8.2 | 28 + 44 |
| 1.4300 | X 12 CrNi 18 8 | 1.6.2 | 28-29 |
| 1.4301 | X 5 CrNi 18 10 | 1.6.2 | 28-29 |
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| 1.4581 | G-X 5 CrNiMoNb 18 10 | 1.6.2 | 28-29 |
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| 1.7225 | 42 CrMo 4 | 1.3.4/1.4.5 | 22-23 |
| 1.7228 | 50 CrMo 4 | 1.3.4/1.4.5 | 22-23 |
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| 2.0070 | SE-Cu | 3.1 | 32-33 |
| 2.0090 | SF-Cu | 3.1 | 32-33 |
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| 2.0265 | CuZn 30 (Ms70) | 3.3 | 32-33 |
| 2.0321 | CuZn 37 | 3.3 | 32-33 |
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| 2.0410 | CuZn 44 Pb 2 (Ms 56) | 3.2 | 34-35 |

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| 2.0580 | CuZn 40 Mn 1 Pb | 3.2 | 34-35 |
| 2.0771 | CuNi 7 Zn 39 Mn 5 Pb 3 | 3.2 | 34-35 |
| 2.0916 | CuAl 5 (AlBz 5) | 3.4 | 36-37 |
| 2.0932 | CuAl 8 Fe 3 (AlBz 8 Fe) | 3.4 | 36-37 |
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| 2.0978 | CuAl 11 Ni 6 Fe 5 | 3.5 | 34-35 |
| 2.1020 | CuSn 6 | 3.3 | 32-33 |
| 2.1030 | CuSn 8 | 3.3 | 32-33 |
| 2.1050 | G-CuSn 10 Zn (Rg 10) | 3.2 | 34-35 |
| 2.1080 | CuSn 6 Zn 6 | 3.3 | 32-33 |
| 2.1086 | G-CuSn 10 | 3.2 | 34-35 |
| 2.1093 | G-CuSn 6 ZnNi | 3.2 | 34-35 |
| 2.1096 | G-CuSn 5 ZnPb (Rg 5) | 3.2 | 34-35 |
| 2.1245 | CuBe 1,7 | 3.3/3.5/3.6 | 32 + 34 |
| 2.1247 | CuBe 2 | 3.3/3.4/3.6 | 32 + 34 + 36 |
| 2.1293 | CuCrZr | 3.3 | 32-33 |
| 2.1356 | CuMn 3 | 3.1 | 32-33 |
| 2.1504 LN | NiAlBz | 6.1 | 42-43 |
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| 2.1525 | CuSi 3 Mn | 3.3 | 32-33 |
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| 2.4060 | Ni 99,6 | 6.1 | 42-43 |
| 2.4062 | Ni 99,4 Fe | 6.1 | 42-43 |
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| 2.4374 LN | - | 6.2 | 42-43 |
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| 2.4632 | NiCr 20 Co 18 Ti | 6.3 | 44-45 |
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| 2.4665 | NiCr 22 Fe 18 Mo | 6.2 | 42-43 |
| 2.4668 | NiCr 19 FeNbMo | 6.3 | 44-45 |
| 2.4670 LN | G - NiCr 13 Al 6 MoNb | 6.3 | 44-45 |
| 2.4674 LN | NiCo 15 Cr 10 MoAlTi | 6.3 | 44-45 |
| 2.4812 | - | 6.2 | 42-43 |
| 2.4816 | NiCr 15 Fe | 6.2 | 42-43 |
| 2.4856 | NiCr 22 Mo 9 Nb | 6.3 | 44-45 |
| 2.4876 | - | 6.2 | 42-43 |
| 2.4983 | NiCr 18 Co 18 MoTi | 6.2 | 42-43 |
| 2.6554 | - | 6.3 | 44-45 |
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| 3.0256 | E-Al H | 4.1 | 38-39 |
| 3.0280 | Al 99,8 H | 4.1 | 38-39 |
| 3.0515 | G-Al 99,5 | 4.2 | 38-39 |
| 3.0516 | S-AlMn | 4.2 | 38-39 |
| 3.0525 | AlMn 1 Mg 0,5 | 4.2 | 38-39 |
| 3.0615 | AlMgSiPb | 4.2 | 38-39 |
| 3.1325 | AlCuMg 1 | 4.2 | 38-39 |
| 3.1355 | AlCuMg 2 | 4.2 | 38-39 |
| 3.1841 | G-AlCu 4 Ti | 4.2 | 38-39 |
| 3.2134 | GD-AlSi 5 Cu 1 Mg | 4.3 | 36-37 |
| 3.2152 | GD-AlSi 6 Cu 4 | 4.3 | 36-37 |
| 3.2162 | GD-AlSi 8 Cu 3 | 4.3 | 36-37 |
| 3.2373 | G-AlSi 9 Mg | 4.3 | 36-37 |
| 3.2381 | G-AlSi 10 Mg | 4.4 | 30-31 |
| 3.2383 | G-AlSi 10 Mg (Cu) | 4.4 | 30-31 |
| 3.2581 | G-AlSi 12 | 4.4 | 30-31 |
| 3.2583 | G-AlSi 12 (Cu) | 4.4 | 30-31 |
| 3.2982 | GD-AlSi 12 (Cu) | 4.4 | 30-31 |
| 3.3241 | G-AlMg 3 Si | 4.2 | 38-39 |
| 3.3292 | GD-AlMg 9 | 4.2 | 38-39 |
| 3.3308 | Al 99,9 Mg 0,5 | 4.1 | 38-39 |
| 3.3315 | AlMg 1 | 4.2 | 38-39 |
| 3.3535 | AlMg 3 | 4.2 | 38-39 |
| 3.4365 | AlZnMgCu 1,5 | 4.2 | 38-39 |
| 3.5106 | G-MgAg 3 SE 2 Zr 1 | 4.4 | 30-31 |
| 3.5562 | G-MgAl 6 | 4.4 | 30-31 |
| 3.5812 | GD-MgAl 8 Zn 1 | 4.4 | 30-31 |
| 3.5912 | GD-MgAl 9 Zn 1 | 4.4 | 30-31 |
| 3.7024.1 LN | Ti 99,5 | 5.1 | 40-41 |
| 3.7034.1 LN | Ti 99,7 | 5.1 | 40-41 |
| 3.7055 | Ti 99,4 | 5.1 | 40-41 |
| 3.7064.1 LN | Ti 99,2 | 5.1 | 40-41 |
| 3.7114 LN | TiAl 5 Sn 2 | 5.2 | 40-41 |
| 3.7124 LN | TiCu 2 | 5.2/5.3 | 40-41 |
| 3.7144 LN | TiAl 6 Sn 2 Zr 4 Mo 2 | 5.3 | 40-41 |
| 3.7154 LN | TiAl 6 Zr 5 | 5.3 | 40-41 |
| 3.7163 LN | TiAl 6 V 4 | 5.2 | 40-41 |
| 3.7164 LN | TiAl 5 V 4 | 5.3 | 40-41 |
| 3.7164 LN | TiAl 6 V 4 | 5.3 | 40-41 |
| 3.7174 LN | TiAl 6 V 6 Sn 2 | 5.2/5.3 | 40-41 |
| 3.7184 LN | TiAl 4 Mo 4 Sn 2 | 5.3 | 40-41 |



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| 100 Cr 2 (W1) | 1.3501 | 1.4.2 | 24-25 |
| 100 Cr 6 (W3) | 1.3505 | 1.4.2 | 24-25 |
| 100 CrMn 6 (W4) | 1.3520 | 1.4.2 | 24-25 |
| 100 CrMo 5 | 1.2303 | 1.5.2/8.2 | 24 + 44 |
| 105 Cr 4 (W2) | 1.3503 | 1.4.2 | 24-25 |
| 105 MnCr 4 | 1.2127 | 1.5.2/8.2 | 24 + 44 |
| 13 Cr 2 (EC30) | 1.7012 | 1.2.1 | 22-23 |
| 14 Ni 6 | 1.5622 | 1.3.1 | 22-23 |
| 15 Cr 3 (EC60) | 1.7015 | 1.2.1 | 22-23 |
| 15 CrNi 6 | 1.5919 | 1.4.6 | 26-27 |
| 15 S 10 | 1.0710 | 1.2.3 | 22-23 |
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| 16 CrMo 4 4 | 1.7337 | 1.3.2 | 22-23 |
| 16 MnCr 5 (EC 80) | 1.7131 | 1.2.1/1.4.6 | 22-23 |
| 17 MoV 84 | 1.5406 | 1.3.2 | 22-23 |
| 19 Mn 5 | 1.0482 | 1.3.2 | 22-23 |
| 20 Mn 5 | 1.1133 | 1.3.4/1.4.1 | 22-23 |
| 20 Mn 6 | 1.1169 | 1.3.1 | 22-23 |
| 20 MnCr 5 | 1.7147 | 1.4.6 | 26-27 |
| 20 MoCr 4 | 1.7321 | 1.4.6 | 26-27 |
| 21 CrMoV 5 11 | 1.8070 | 1.3.2 | 22-23 |
| 21 MoV 53 | 1.5404 | 1.3.2 | 22-23 |
| 24 Ni 8 | 1.5633 | 1.3.1 | 22-23 |
| 25 CrMo 4 | 1.7218 | 1.4.1 | 24-25 |
| 25 MoCr 4 | 1.7325 | 1.4.6 | 26-27 |
| 26 CrMo 4 | 1.7219 | 1.3.1 | 22-23 |
| 28 Mn 6 | 1.1170 | 1.3.4 | 22-23 |
| 28 Mn 6 V | 1.1170 | 1.4.1 | 24-25 |
| 31 CrMo 12 | 1.8515 | 1.3.3/1.4.7 | 22-23 |
| 31 CrMoV 9 | 1.8519 | 1.3.3 | 22-23 |
| 34 CrAl 6 | 1.8504 | 1.3.3/1.4.7 | 22-23 |
| 34 CrAlMo 5 | 1.8507 | 1.4.7 | 26-27 |
| 34 CrAlNi 7 | 1.8550 | 1.3.3/1.4.7 | 22-23 |
| 34 CrAlSi 5 | 1.8506 | 1.3.3 | 22-23 |
| 34 CrMo 4 | 1.7220 | 1.3.4/1.4.5 | 22-23 |
| 35 S 20 | 1.0726 | 1.2.3 | 22-23 |
| 38 Si 6 | 1.5022 | 1.4.3 | 24-25 |
| 40 CrMnMo 7 | 1.2311 | 1.5.5/8.2 | 26 + 44 |
| 40 CrMnMoS 8 6 | 1.2312 | 1.5.4/8.2 | 26 + 44 |
| 40 Mn 4 | 1.1157 | 1.3.4 | 22-23 |
| 40 Mn 4 V | 1.1157 | 1.4.1 | 24-25 |
| 41 CrAlMo 7 | 1.8509 | 1.4.7 | 26-27 |
| 42 CrMo 4 | 1.7225 | 1.3.4/1.4.5 | 22-23 |
| 45 S 20 | 1.0727 | 1.2.3 | 22-23 |
| 46 Si 7 | 1.5024 | 1.4.3 | 24-25 |
| 50 CrMo 4 | 1.7228 | 1.3.4/1.4.5 | 22-23 |
| 51 CrMoV 4 | 1.7701 | 1.4.3 | 24-25 |
| 51 Si 7 | 1.5025 | 1.4.3 | 24-25 |
| 60 SiMn 5 | 1.5142 | 1.4.3 | 24-25 |
| 65 MnCrMo 4 | 1.2309 | 1.5.5/8.2 | 26 + 44 |
| 67 SiCr 5 | 1.7103 | 1.4.3 | 24-25 |
| 9 SMn 28 | 1.0715 | 1.2.3 | 22-23 |
| 9 SMn 36 | 1.0736 | 1.2.3 | 22-23 |
| 9 SMnPb 28 | 1.0718 | 1.2.3 | 22-23 |
| 9 SMnPb 36 | 1.0737 | 1.2.3 | 22-23 |
| 90 MnCrV 8 | 1.2842 | 1.5.2/8.2 | 24 + 44 |
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| Al 99,8 H | 3.0280 | 4.1 | 38-39 |
| Al 99,9 Mg 0,5 | 3.3308 | 4.1 | 38-39 |
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| AlCuMg 2 | 3.1355 | 4.2 | 38-39 |
| AlMg 1 | 3.3315 | 4.2 | 38-39 |
| AlMg 3 | 3.3535 | 4.2 | 38-39 |
| AlMgSiPb | 3.0615 | 4.2 | 38-39 |
| AlMn 1 Mg 0,5 | 3.0525 | 4.2 | 38-39 |
| AlZnMgCu 1,5 | 3.4365 | 4.2 | 38-39 |
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| AMPCO 15 | - | 3.4 | 36-37 |
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| AMPCO 8 | - | 3.4 | 36-37 |
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| C 110 W | 1.1554 | 1.5.1/8.2 | 24 + 44 |
| C 15 | 1.0401 | 1.2.1 | 22-23 |
| C 22 | 1.0402 | 1.2.2 | 22-23 |
| C 30 | 1.0528 | 1.2.2 | 22-23 |
| C 35 | 1.0501 | 1.2.2 | 22-23 |
| C 45 | 1.0503 | 1.2.2 | 22-23 |
| C 45 W | 1.1730 | 1.5.1/8.2 | 24 + 44 |
| C 55 W | 1.1820 | 1.5.1/8.2 | 24 + 44 |
| C 60 W | 1.1740 | 1.5.1/8.2 | 24 + 44 |
| C 67 W | 1.1744 | 1.5.1/8.2 | 24 + 44 |
| C 70 W1 | 1.1520 | 1.5.1/8.2 | 24 + 44 |
| C 80 W1 | 1.1525 | 1.5.1/8.2 | 24 + 44 |
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| Ck 15 | 1.1141 | 1.2.1 | 22-23 |
| Ck 22 | 1.1151 | 1.2.2 | 22-23 |
| Ck 30 | 1.1178 | 1.2.2 | 22-23 |
| Ck 35 | 1.1181 | 1.2.2 | 22-23 |
| Ck 45 | 1.1191 | 1.2.2 | 22-23 |
| Cm 15 (C 15 R) | 1.1140 | 1.2.1 | 22-23 |
| Cm 35 | 1.1180 | 1.2.2 | 22-23 |
| CPM 10 V | - | 1.5.2/8.2 | 24 + 44 |
| CPM REX M4 | - | 1.5.3/8.2 | 24 + 44 |
| Cq 15 | 1.1132 | 1.2.4 | 22-23 |
| Cq 22 | 1.1152 | 1.2.4 | 22-23 |
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| CuAl 10 Ni 5 Fe 4 | 2.0966 | 3.4 | 36-37 |
| CuAl 11 Ni 6 Fe 5 | 2.0978 | 3.5 | 34-35 |
| CuAl 5 (AlBz 5) | 2.0916 | 3.4 | 36-37 |
| CuAl 8 Fe 3 (AlBz 8 Fe) | 2.0932 | 3.4 | 36-37 |
| CuBe 1,7 | 2.1245 | 3.3/3.5/3.6 | 32 + 34 |
| CuBe 2 | 2.1247 | 3.3/3.4/3.6 | 32 + 34 + 36 |
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| CuMn 3 | 2.1356 | 3.1 | 32-33 |
| CuNi 7 Zn 39 Mn 5 Pb 3 | 2.0771 | 3.2 | 34-35 |
| CuSi 2 Mn | 2.1522 | 3.1 | 32-33 |
| CuSi 3 Mn | 2.1525 | 3.3 | 32-33 |
| CuSn 6 | 2.1020 | 3.3 | 32-33 |
| CuSn 6 Zn 6 | 2.1080 | 3.3 | 32-33 |
| CuSn 8 | 2.1030 | 3.3 | 32-33 |
| CuZn 20 (Ms80) | 2.0250 | 3.3 | 32-33 |
| CuZn 30 (Ms70) | 2.0265 | 3.3 | 32-33 |
| CuZn 36 (Ms63) | 2.0335 | 3.3 | 32-33 |
| CuZn 37 | 2.0321 | 3.3 | 32-33 |
| CuZn 39 Pb 2 (Ms58) | 2.0380 | 3.2 | 34-35 |
| CuZn 40 (Ms60) | 2.0360 | 3.2 | 34-35 |
| CuZn 40 Al 1 | 2.0561 | 3.2 | 34-35 |
| CuZn 40 Mn 1 Pb | 2.0580 | 3.2 | 34-35 |
| CuZn 44 Pb 2 (Ms 56) | 2.0410 | 3.2 | 34-35 |
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| E-Cu 57 | 2.0060 | 3.1 | 32-33 |
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| G-Al 99,5 | 3.0515 | 4.2 | 38-39 |
| G-AlCu 4 Ti | 3.1841 | 4.2 | 38-39 |
| G-AlMg 3 Si | 3.3241 | 4.2 | 38-39 |
| G-AlSi 10 Mg | 3.2381 | 4.4 | 30-31 |
| G-AlSi 10 Mg (Cu) | 3.2383 | 4.4 | 30-31 |
| G-AlSi 12 | 3.2581 | 4.4 | 30-31 |
| G-AlSi 12 (Cu) | 3.2583 | 4.4 | 30-31 |
| G-AlSi 17 Cu 4 | - | 4.5 | 30-31 |
| G-AlSi 21 CuNiMg | - | 4.5 | 30-31 |
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| G-CuSn 10 Zn (Rg 10) | 2.1050 | 3.2 | 34-35 |
| G-CuSn 5 ZnPb (Rg 5) | 2.1096 | 3.2 | 34-35 |
| G-CuSn 6 ZnNi | 2.1093 | 3.2 | 34-35 |
| GD-AlMg 9 | 3.3292 | 4.2 | 38-39 |
| GD-AlSi 12 (Cu) | 3.2982 | 4.4 | 30-31 |
| GD-AlSi 5 Cu 1 Mg | 3.2134 | 4.3 | 36-37 |
| GD-AlSi 6 Cu 4 | 3.2152 | 4.3 | 36-37 |
| GD-AlSi 8 Cu 3 | 3.2162 | 4.3 | 36-37 |
| GD-MgAl 8 Zn 1 | 3.5812 | 4.4 | 30-31 |
| GD-MgAl 9 Zn 1 | 3.5912 | 4.4 | 30-31 |
| GFK Glasfaserverstärkt | - | 7.3 | 30-31 |
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| GG-15 | 0.6015 | 2.1 | 30-31 |
| GG-20 | 0.6020 | 2.1 | 30-31 |
| GG-25 | 0.6025 | 2.1 | 30-31 |
| GG-30 | 0.6030 | 2.2 | 30-31 |
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| GGG-35.3 | 0.7033 | 2.3 | 30-31 |
| GGG-40 | 0.7040 | 2.3 | 30-31 |

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| GGG-50 | 0.7050 | 2,3 | 30-31 |
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| G-MgAg 3 SE 2 Zr 1 | 3.5106 | 4,4 | 30-31 |
| G-MgAl 6 | 3.5562 | 4,4 | 30-31 |
| GS-15 CrNi 6 | 1.5919 | 1,3,5 | 22-23 |
| GS-18 CrMo 9 10 | 1.7379 | 1,3,5 | 22-23 |
| GS-25 CrMo 4 | 1.7218 | 1,3,5 | 22-23 |
| GS-34 CrMo 4 | 1.7220 | 1,3,5 | 22-23 |
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| GTS-45-06 | 0.8145 | 2,3 | 30-31 |
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| GTW-45-07 | 0.8045 | 2,3 | 30-31 |
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| G-X 22 CrNi 17 | 1.4059 | 1,6,3 | 28-29 |
| G-X 25 CrNiSi 18 9 | 1.4825 | 1,6,6/8,2 | 28 + 44 |
| G-X 30 CrSi 6 | 1.4710 | 1,6,6/8,2 | 28 + 44 |
| G-X 40 CrNiSi 25 20 | 1.4848 | 1,6,6/8,2 | 28 + 44 |
| G-X 40 CrSi 13 | 1.4729 | 1,6,6/8,2 | 28 + 44 |
| G-X 5 CrNiMoNb 18 10 | 1.4581 | 1,6,2 | 28-29 |
| G-X 6 CrNiNb 18 10 | 1.4550 | 1,6,2 | 28-29 |
| G-X 8 CrNi 13 | 1.4008 | 1,6,3 | 28-29 |
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| H III | 1.0435 | 1,1,2 | 22-23 |
| H IV | 1.0445 | 1,1,2 | 22-23 |
| HARDOX 400 | - | 1,4,4 | 24-25 |
| HARDOX 500 | - | 8,2,1 | 44-45 |
| Hostaform | - | 7,1 | 38-39 |
| Hostalen | - | 7,1 | 38-39 |
| Makralon | - | 7,1 | 38-39 |
| Ni 99 CSi | 2.4042 | 6,1 | 42-43 |
| Ni 99,4 Fe | 2.4062 | 6,1 | 42-43 |
| Ni 99,6 | 2.4060 | 6,1 | 42-43 |
| NiAlBz | 2.1504 LN | 6,1 | 42-43 |
| NiCo 15 Cr 10 MoAlTi | 2.4674 LN | 6,3 | 44-45 |
| NiCo 20 Cr 15 MoAlTi | 2.4634 | 6,3 | 44-45 |
| NiCr 15 Fe | 2.4816 | 6,2 | 42-43 |
| NiCr 18 Co 18 MoTi | 2.4983 | 6,2 | 42-43 |
| NiCr 19 FeNbMo | 2.4668 | 6,3 | 44-45 |
| NiCr 20 Co 18 Ti | 2.4632 | 6,3 | 44-45 |
| NiCr 20 TiAl | 2.4631 | 6,3 | 44-45 |
| NiCr 22 Fe 18 Mo | 2.4665 | 6,2 | 42-43 |
| NiCr 22 Mo 9 Nb | 2.4856 | 6,3 | 44-45 |
| NiCu 30 Fe | 2.4360 | 6,2 | 42-43 |
| NiMo 28 | 2.4617 | 6,2 | 42-43 |
| Pertinax | - | 7,2 | 30-31 |
| Polystyrol | - | 7,1 | 38-39 |
| Resopal | - | 7,2 | 30-31 |
| S 2-9-1 | 1.3346 | 1,5,3/8,2 | 24 + 44 |
| S 2-9-2 | 1.3348 | 1,5,3/8,2 | 24 + 44 |
| S 6-5-2 | 1.3343 | 1,5,3/8,2 | 24 + 44 |
| S 6-5-2-5 | 1.3243 | 1,5,3/8,2 | 24 + 44 |
| S 6-5-3 | 1.3344 | 1,5,3/8,2 | 24 + 44 |
| S-AlMn | 3.0516 | 4,2 | 38-39 |
| SE-Cu | 2.0070 | 3,1 | 32-33 |
| SF-Cu | 2.0090 | 3,1 | 32-33 |
| St 33 | 1.0035 | 1,1,1 | 22-23 |
| St 37 | 1.0120 | 1,1,1 | 22-23 |
| St 37-2 | 1.0037 | 1,1,1 | 22-23 |
| St 37-3 | 1.0116 | 1,1,1 | 22-23 |
| St 42 | 1.0140 | 1,1,1 | 22-23 |
| St 42-2 | 1.0181 | 1,1,1 | 22-23 |
| St 44-2 | 1.0044 | 1,1,1 | 22-23 |
| St 44-3 | 1.0144 | 1,1,1 | 22-23 |
| St 50 | 1.0531 | 1,1,1 | 22-23 |
| St 50-2 | 1.0050 | 1,1,1 | 22-23 |
| St 52-3 | 1.0570 | 1,1,1 | 22-23 |
| St 60-2 | 1.0060 | 1,1,1 | 22-23 |
| St 70-2 | 1.0070 | 1,1,1 | 22-23 |
| StE 255 | 1.0461 | 1,1,4 | 22-23 |
| StE 355 | 1.0582 | 1,1,4 | 22-23 |
| StE 460 | 1.8905 | 1,1,4 | 22-23 |
| StE 500 | 1.8907 | 1,1,4 | 22-23 |
| StE 690 V | 1.8931 | 1,4,8 | 26-27 |
| StE 960 V | 1.8941 | 1,4,8 | 26-27 |

| DIN (DE) | W-Nr. | MAT | |
|-----------------------|-------------|-------------|---------|
| Ti 99,2 | 3.7064.1 LN | 5,1 | 40-41 |
| Ti 99,4 | 3.7055 | 5,1 | 40-41 |
| Ti 99,5 | 3.7024.1 LN | 5,1 | 40-41 |
| Ti 99,7 | 3.7034.1 LN | 5,1 | 40-41 |
| TiAl 4 Mo 4 Sn 2 | 3.7184 LN | 5,3 | 40-41 |
| TiAl 5 Sn 2 | 3.7114 LN | 5,2 | 40-41 |
| TiAl 5 V 4 | 3.7164 LN | 5,3 | 40-41 |
| TiAl 6 Sn 2 Zr 4 Mo 2 | 3.7144 LN | 5,3 | 40-41 |
| TiAl 6 V 4 | 3.7163 LN | 5,2 | 40-41 |
| TiAl 6 V 4 | 3.7164 LN | 5,3 | 40-41 |
| TiAl 6 V 6 Sn 2 | 3.7174 LN | 5,2/5,3 | 40-41 |
| TiAl 6 Zr 5 | 3.7154 LN | 5,3 | 40-41 |
| TiCu 2 | 3.7124 LN | 5,2/5,3 | 40-41 |
| TOOLUX 33 | - | 1,5,2/8,2 | 24 + 44 |
| TOOLUX 44 | - | 8,2,1 | 44-45 |
| Ultramit | - | 7,1 | 38-39 |
| VANADIS 10 | - | 1,5,2/8,2 | 24 + 44 |
| VANADIS 4 | - | 1,5,2/8,2 | 24 + 44 |
| X 10 Cr 13 | 1.4006 | 1,6,5/8,2 | 28 + 44 |
| X 10 CrAl 24 | 1.4762 | 1,6,3 | 28-29 |
| X 10 CrMo 13 | 1.4106 | 1,6,5/8,2 | 28 + 44 |
| X 10 CrNiMoTi 18 12 | 1.4573 | 1,6,2 | 28-29 |
| X 10 CrNiSi 18 9 | 1.4305 | 1,6,1 | 28-29 |
| X 10 CrNiSi 18 9 | 1.4305 | 1,6,1 | 28-29 |
| X 10 CrSi 13 | 1.4722 | 1,6,3 | 28-29 |
| X 10 CrSi 6 | 1.4712 | 1,6,3 | 28-29 |
| X 100 CrMoV 5 1 | 1.2363 | 1,5,2/8,2 | 24 + 44 |
| X 102 CrMo 17 | 1.3543 | 1,4,2 | 24-25 |
| X 105 CrCoMo 18 2 | 1.4528 | 1,6,3 | 28-29 |
| X 12 CrMoS 17 | 1.4104 | 1,6,1 | 28-29 |
| X 12 CrNi 18 8 | 1.4300 | 1,6,2 | 28-29 |
| X 12 CrS 13 | 1.4005 | 1,6,5/8,2 | 28 + 44 |
| X 120 Mn 12 | 1.3401 | 1,4,4 | 24-25 |
| X 15 Cr 13 | 1.4024 | 1,6,5/8,2 | 28 + 44 |
| X 165 CrCoMo 12 | 1.2880 | 1,5,2/8,2 | 24 + 44 |
| X 165 CrMoV 12 | 1.2601 | 1,5,2/8,2 | 24 + 44 |
| X 165 CrV 12 | 1.2201 | 1,5,2/8,2 | 24 + 44 |
| X 2 CrNiMo 18 14 3 | 1.4435 | 1,6,2 | 28-29 |
| X 2 CrNiMo 18 15 | 1.4433 | 1,6,2 | 28-29 |
| X 2 CrNiMoN 17 12 2 | 1.4406 | 1,3,1/1,6,2 | 22-23 |
| X 2 CrNi 18 10 | 1.4311 | 1,3,1 | 22-23 |
| X 20 Cr 13 | 1.4021 | 1,6,5/8,2 | 28 + 44 |
| X 20 CrMoV 12 1 | 1.4922 | 1,3,2 | 22-23 |
| X 20 CrNi 17 2 | 1.4057 | 1,6,5/8,2 | 28 + 44 |
| X 20 CrNiSi 25 4 | 1.4821 | 1,6,4 | 28-29 |
| X 210 Cr 12 | 1.2080 | 1,5,2/8,2 | 24 + 44 |
| X 210 CrCoW 12 | 1.2884 | 1,5,2/8,2 | 24 + 44 |
| X 210 CrW 12 | 1.2436 | 1,5,2/8,2 | 24 + 44 |
| X 3 CrNiMoN 25 7 4 | 1.4410 | 1,6,2 | 28-29 |
| X 30 Cr 13 | 1.4028 | 1,6,5/8,2 | 28 + 44 |
| X 36CrMo 17 | 1.2316 | 1,5,4/8,2 | 26 + 44 |
| X 38 CrMoV 5 3 | 1.2367 | 1,5,5/8,2 | 26 + 44 |
| X 38CrMoV 5 1 | 1.2343 | 1,5,5/8,2 | 26 + 44 |
| X 4 CrMoS 18 | 1.4105 | 1,6,1 | 28-29 |
| X 4 CrNiMoNb 25 7 | 1.4582 | 1,6,4 | 28-29 |
| X 40 CrMoV 5 1 | 1.2344 | 1,5,5/8,2 | 26 + 44 |
| X 42Cr 13 | 1.2083 | 1,5,4/8,2 | 26 + 44 |
| X 45 CoCrMoV 5 5 3 | 1.2889 | 1,5,5/8,2 | 26 + 44 |
| X 45 CoCrMoV 5 5 3 | 1.2889 | 1,5,5/8,2 | 26 + 44 |
| X 45 CrCoVW 5 5 5 | 1.2678 | 1,5,5/8,2 | 26 + 44 |
| X 45 CrMoV 15 | 1.4116 | 1,6,5/8,2 | 28 + 44 |
| X 45 CrSi 9 3 | 1.4718 | 1,6,6/8,2 | 28 + 44 |
| X 45 NiCrMo 4 | 1.2767 | 1,5,5/8,2 | 26 + 44 |
| X 46 Cr 13 | 1.4034 | 1,6,5/8,2 | 28 + 44 |
| X 5 CrNi 18 10 | 1.4301 | 1,6,2 | 28-29 |
| X 5 CrTi 12 | 1.4512 | 1,6,3 | 28-29 |
| X 50 NiCrWV 13 13 | 1.2731 | 1,5,5/8,2 | 26 + 44 |
| X 6 Cr 13 | 1.4000 | 1,6,3 | 28-29 |
| X 6 Cr 17 | 1.4016 | 1,6,3 | 28-29 |
| X 6 CrAl 13 | 1.4002 | 1,6,3 | 28-29 |
| X 6 CrMo 17 | 1.4113 | 1,6,3 | 28-29 |
| X 6 CrNb 17 | 1.4511 | 1,6,3 | 28-29 |
| X 6 CrNi 18 9 | 1.4308 | 1,6,2 | 28-29 |
| X 6 CrNiMo 18 10 | 1.4408 | 1,6,2 | 28-29 |
| X 6 CrNiMoTi 17 12 2 | 1.4571 | 1,6,2 | 28-29 |
| X 6 CrNiTi 18 10 | 1.4541 | 1,6,2 | 28-29 |
| X 6 CrTi 17 | 1.4510 | 1,6,3 | 28-29 |
| X 60 WCrMoV 9 4 | 1.2622 | 1,5,5/8,2 | 26 + 44 |
| X 8 CrNi 18 12 | 1.3956 | 1,6,2 | 28-29 |
| X 8 CrNiMo 27 5 | 1.4460 | 1,6,4 | 28-29 |
| X 80 CrNiSi 20 | 1.4747 | 1,6,6/8,2 | 28 + 44 |
| X 90 CrMoV 18 | 1.4112 | 1,6,5/8,2 | 28 + 44 |
| X155 CrMoV 12 1 | 1.2379 | 1,5,2/8,2 | 24 + 44 |





Werkstoffübersicht nach Werkstoffbezeichnung EU (EU)
Work material overview according material name EU (EU)
Index-Groupes de matières selon dénomination EU (EU)
Panoramica dei materiali secondo la designazione EU (EU)



| EN (EU) | DIN (DE) | W-Nr. | NFA (FR) | UNI (IT) | MAT | |
|------------------------------|-------------------|--------|------------------------------|-----------------------|-----------|---------|
| 1 C 22 | C 22 | 1.0402 | AF 42 C 20; XC 25 | C 20; C 21 | 1.2.2 | 22-23 |
| 1 C 30 | C 30 | 1.0528 | AF 50 C 30; CC 32 | C 30 | 1.2.2 | 22-23 |
| 1 C 35 | C 35 | 1.0501 | AF 55 C 35; XC 38 | C 35 | 1.2.2 | 22-23 |
| 1 C 45 | C 45 | 1.0503 | AF 65 C 45; CC 45 | C 45 | 1.2.2 | 22-23 |
| 10 S 20 | 10 S 20 | 1.0721 | 10 F 1 | CF 10 S 20 | 1.2.3 | 22-23 |
| 10 SPb 20 | 10 SPb 20 | 1.0722 | 10 Pb F 2 | CF 10 SPb 20 | 1.2.3 | 22-23 |
| 100 Cr 6 | 100 Cr 6 (W3) | 1.3505 | 100 C 6; 20 NCD 2 | 100 Cr 6 | 1.4.2 | 24-25 |
| 100 CrMn 6 | 100 CrMn 6 (W4) | 1.3520 | 100 CM 6 | - | 1.4.2 | 24-25 |
| 11 SMn 28 | 9 SMn 28 | 1.0715 | S 250 | CF 9 SMn 28 | 1.2.3 | 22-23 |
| 11 SMnPb 28 | 9 SMnPb 28 | 1.0718 | S 250 Pb; 35 MF 4 | CF 9 SMnPb 28 | 1.2.3 | 22-23 |
| 16 MnCr 5 | 16 MnCr 5 (EC 80) | 1.7131 | 16 MC 5; 15 D 3 | 16 MnCr 5 | 1.2.1 | 22-23 |
| 16 MnCr 5 | 16 MnCr 5 (EC 80) | 1.7131 | 16 MC 5; 15 D 3 | 16 MnCr 5 | 1.4.6 | 26-27 |
| 2 C 10 | Ck 10 | 1.1121 | C 10 E; XC 10 | C 10 | 1.2.1 | 22-23 |
| 2 C 15 | Ck 15 | 1.1141 | C 15 E; XC 12 | C 16 | 1.2.1 | 22-23 |
| 2 C 22 | Ck 22 | 1.1151 | C 22 E; XC 25 | C 20 | 1.2.2 | 22-23 |
| 2 C 30 | Ck 30 | 1.1178 | C 30 E; XC 32 | C 30 | 1.2.2 | 22-23 |
| 2 C 35 | Ck 35 | 1.1181 | C 35 E; XC 38 H 1; 320-560 M | C 35 | 1.2.2 | 22-23 |
| 2 C 45 | Ck 45 | 1.1191 | C 45 E; XC 42 H 1; XC 45 | C 45 | 1.2.2 | 22-23 |
| 20 MoCr 4 | 20 MoCr 4 | 1.7321 | - | 16 NiCrMo 2 | 1.4.6 | 26-27 |
| 25 CrMo 4 | 25 CrMo 4 | 1.7218 | 25 CD 4 | 25 CrMo 4 | 1.4.1 | 24-25 |
| 25 CrMo 4 | GS-25 CrMo 4 | 1.7218 | 25 CD 4 | 25 CrMo 4 | 1.3.5 | 22-23 |
| 3 C 35 | Cm 35 | 1.1180 | C 35 R; XC 32 | - | 1.2.2 | 22-23 |
| 31 CrMo 12 | 31 CrMo 12 | 1.8515 | 30 CD 12 | 31 CrMo 12 | 1.3.3 | 22-23 |
| 31 CrMo 12 | 31 CrMo 12 | 1.8515 | 30 CD 12 | 31 CrMo12 | 1.4.7 | 26-27 |
| 34 CrAlMo 5 | 34 CrAlMo 5 | 1.8507 | 30 CAD 6.12 | 34 CrAlMo 7 | 1.4.7 | 26-27 |
| 35 CrAlNi 7 | 34 CrAlNi7 | 1.8550 | - | - | 1.4.7 | 26-27 |
| 34 CrMo 4 | 34 CrMo 4 | 1.7220 | 34 CD 4 | 35 CrMo 4 | 1.3.4 | 22-23 |
| 34 CrMo 4 | GS-34 CrMo 4 | 1.7220 | 34 CD 4 | 35 CrMo 4 | 1.3.5 | 22-23 |
| 34 CrMo 4 | 34 CrMo 4 | 1.7220 | 34 CD 4 | 35 CrMo 4 | 1.4.5 | 26-27 |
| 35 S 20 | 35 S 20 | 1.0726 | 35 MF 4 | - | 1.2.3 | 22-23 |
| 41 CrAlMo 7 | 41 CrAlMo 7 | 1.8509 | 40 CAD 6.12; Z 8 C 13 | 41 CrAlMo 7 | 1.4.7 | 26-27 |
| 42 CrMo 4 | 42 CrMo 4 | 1.7225 | 42 CD 4; 42 C 4 TS | 42 CrMo 4 | 1.3.4 | 22-23 |
| 42 CrMo 4 | 42 CrMo 4 | 1.7225 | 42 CD 4; 42 C 4 TS | 42 CrMo 4 | 1.4.5 | 26-27 |
| 45 S 20 | 45 S 20 | 1.0727 | 45 MF 4 | - | 1.2.3 | 22-23 |
| 50 CrMo 4 | 50 CrMo 4 | 1.7228 | - | 50 CrMo 4 | 1.3.4 | 22-23 |
| 50 CrMo 4 | 50 CrMo 4 | 1.7228 | - | 50 CrMo 4 | 1.4.5 | 26-27 |
| AW-2017 A | AlCuMg 1 | 3.1325 | A - U 4 G | 3579 | 4.2 | 38-39 |
| AW-2024 | AlCuMg 2 | 3.1355 | A - U 4 G 1 | 3583 | 4.2 | 38-39 |
| AW-6082 | AlMg 1 | 3.3315 | A - G 0,6 | 5764 | 4.2 | 38-39 |
| C 105 U | C 105 W1 | 1.1545 | Y 105 | C 100 KU | 1.5.1/8.2 | 24 + 44 |
| C 110 U | C 110 W | 1.1554 | - | - | 1.5.1/8.2 | 24 + 44 |
| C 15 KD | Cq 15 | 1.1132 | C 15 C | C15E2C | 1.2.4 | 22-23 |
| C 15 R | Cm 15 (C 15 R) | 1.1140 | C 15 R | C 15 R | 1.2.1 | 22-23 |
| C 21 KD | Cq 22 | 1.1152 | C 22 C | C20E2C | 1.2.4 | 22-23 |
| C 35 KD | Cq 35 | 1.1172 | C 35 C | - | 1.2.4 | 22-23 |
| C 45 KD | Cq 45 | 1.1192 | C 45 C | C45EC | 1.2.4 | 22-23 |
| C 45 U | C 45 W | 1.1730 | Y 3 42 | - | 1.5.1/8.2 | 24 + 44 |
| C 60 U | C 60 W | 1.1740 | Y 3 55 | - | 1.5.1/8.2 | 24 + 44 |
| C 70 U | C 70 W1 | 1.1520 | - | - | 1.5.1/8.2 | 24 + 44 |
| C 80 U | C 80 W1 | 1.1525 | Y190; Y180 | C 80 KU | 1.5.1/8.2 | 24 + 44 |
| E 295 | St 50-2 | 1.0050 | A 50-2 | Fe 490 | 1.1.1 | 22-23 |
| EN-GJV-300 | GGV-30 | - | - | - | 2.4 | 30-31 |
| EN-GJV-400 | GGV-40 | - | - | - | 2.4 | 30-31 |
| Fe 360 D1(2); S 235 J2G3(4) | St 37-3 | 1.0116 | Fe 360 D1(2); E 24-4 | Fe 360 D 1(2); Fe37-3 | 1.1.1 | 22-23 |
| Fe 430 D1(2);S 275 J2 G3 (4) | St 44-3 | 1.0144 | Fe 430 D1(2); E 28-4 | Fe 430 D1(2) | 1.1.1 | 22-23 |
| Fe 510 D1; S 355 J 2 G 3 | St 52-3 | 1.0570 | Fe 510 D1; E 36-4 | Fe 510 D1 | 1.1.1 | 22-23 |
| GE 200 | GS-38 | 1.0420 | E 24-2 Ne | - | 1.1.3 | 22-23 |
| GE 260 | GS-52 | 1.0552 | AF 55 C 35 | - | 1.1.3 | 22-23 |
| GE 360; S 355J 0 | GS-60 | 1.0558 | AF 65 C 45; E 36-3 | Fe 510 | 1.1.3 | 22-23 |
| GJL-100 | GG-10 | 0.6010 | Ft 10 B; FGL 100 | G 10 | 2.1 | 30-31 |
| GJL-150 | GG-15 | 0.6015 | Ft 15 D; FGL 150 | G 15; GS 370-17 | 2.1 | 30-31 |
| GJL-200 | GG-20 | 0.6020 | Ft 20 D; FGL 200 | G 20 | 2.1 | 30-31 |
| GJL-250 | GG-25 | 0.6025 | Ft 25 D; FGL 250 | G 25 | 2.1 | 30-31 |
| GJL-300 | GG-30 | 0.6030 | Ft 30 D; FGL 300 | G 30; GS 700-2 | 2.2 | 30-31 |
| GJL-350 | GG-35 | 0.6035 | Ft 35 D; FGL 350 | G 35 | 2.2 | 30-31 |
| GJL-400 | GG-40 | 0.6040 | Ft 40 D; FGL 400 | G 40; GMN 70 | 2.2 | 30-31 |
| GJMB-350-10 | GTS-35-10 | 0.8135 | MN 350-10 | P 35-10 | 2.3 | 30-31 |
| GJMB-450-6 | GTS-45-06 | 0.8145 | MN 450-6 | GMN 55 / P45-06 | 2.3 | 30-31 |
| GJMB-550-4 | GTS-55-04 | 0.8155 | MN 550-4 / MP 50-5 | GMN 65 / P55-04 | 2.3 | 30-31 |
| GJMB-650-2 | GTS-65-02 | 0.8165 | MN 650-3 | GMN 70 / P65-02 | 2.3 | 30-31 |
| GJMW-350-4 | GTW-35-04 | 0.8035 | MB 35-7 | W 35-04 | 2.3 | 30-31 |
| GJMW-400-5 | GTW-40-05 | 0.8040 | MB 40-10; MB 400-5 | GMB 40 / W40-05 | 2.3 | 30-31 |
| GJMW-450-7 | GTW-45-07 | 0.8045 | MB 450-7 | GMB 45 / W45-07 | 2.3 | 30-31 |
| GJS-350-22 | GGG-35.3 | 0.7033 | FGS 370-17 | GMN 45 | 2.3 | 30-31 |
| GJS-400-15 | GGG-40 | 0.7040 | FGS 400-15 | GS 400-12 | 2.3 | 30-31 |
| GJS-400-18 | GGG-40.3 | 0.7043 | FGS 370-17 | GSO 42/17 | 2.3 | 30-31 |

| EN (EU) | DIN (DE) | W-Nr. | NFA (FR) | UNI (IT) | MAT | |
|----------------------|-----------------------|-----------|----------------------------|---------------------|-------------|---------|
| GJS-500-7 | GGG-50 | 0.7050 | FGS 500-7 | GS 500-7 | 2.3 | 30-31 |
| GJS-600-3 | GGG-60 | 0.7060 | FGS 600-3 | GS 600-3 | 2.3 | 30-31 |
| G-X 10 CrNi 18 8 | G-X 10 CrNi 18 8 | 1.4312 | Z 10 CN 18-09 M | - | 1.6.2 | 28-29 |
| GX 2 NiCrMoCuN 25 20 | G-X 2 NiCrMoCuN 25 20 | 1.4536 | - | - | 1.6.2 | 28-29 |
| G-X 6 CrNiNb 18 10 | G-X 6 CrNiNb 18 10 | 1.4550 | Z 6 CNNb 18-10 | Z 6 CrNiNb 18-10 | 1.6.2 | 28-29 |
| G-X 7 CrNiMo 12-1 | G-X 8 CrNi 13 | 1.4008 | Z 12 CN 13 M | GX 12 Cr 13 | 1.6.3 | 28-29 |
| Hastelloy B 2 | NiMo 28 | 2.4617 | NiMo 28 | - | 6.2 | 42-43 |
| Hastelloy C | - | 2.4812 | - | - | 6.2 | 42-43 |
| Hastelloy X | NiCr 22 Fe 18 Mo | 2.4665 | NC 22 FeD | - | 6.2 | 42-43 |
| HS 1-8-1 | S 2-9-1 | 1.3346 | Z 85 DCWV 08-04-02-01 | HS 1-8-1 | 1.5.3/8.2 | 24 + 44 |
| HS 2-9-2 | S 2-9-2 | 1.3348 | Z 100 WCWV 09-04-02-02 | HS 2-9-2 | 1.5.3/8.2 | 24 + 44 |
| HS 6-5-2 | S 6-5-2 | 1.3343 | Z 85 WDCV 06-05-04-02 | HS 6-5-2 | 1.5.3/8.2 | 24 + 44 |
| HS 6-5-2-5 | S 6-5-2-5 | 1.3243 | 785 WD; KCV 06-05-05-04-02 | HS 6-5-2-5 | 1.5.3/8.2 | 24 + 44 |
| HS 6-5-3 | S 6-5-3 | 1.3344 | Z 120 WDCV 06-05-04-03 | HS 6-5-3 | 1.5.3/8.2 | 24 + 44 |
| Inconel 500 | NiCr 18 Co 18 MoTi | 2.4983 | NCK 19 DAT | - | 6.2 | 42-43 |
| Inconel 600 | NiCr 15 Fe | 2.4816 | NC 15 Fe | - | 6.2 | 42-43 |
| Inconel 625 | NiCr 22 Mo 9 Nb | 2.4856 | NC 22 FeDNB | - | 6.3 | 44-45 |
| Inconel 718 | NiCr 19 FeNbMo | 2.4668 | NC 19 Fe Nb | - | 6.3 | 44-45 |
| Inconel 800 | - | 2.4876 | - | - | 6.2 | 42-43 |
| MCMgAl 8 Zn 1 | GD-MgAl 8 Zn 1 | 3.5812 | G-A 9 | AZ 81 hp | 4.4 | 30-31 |
| MCMgAl 9 Zn 1 | GD-MgAl 9 Zn 1 | 3.5912 | G-A 9 Z 1 | AZ 91 hp | 4.4 | 30-31 |
| MCMgRE 2 Ag 2 Zr | G-MgAg 3 SE 2 Zr 1 | 3.5106 | G-Ag 22,5 | - | 4.4 | 30-31 |
| Monel 400 | NiCu 30 Fe | 2.4360 | NU 30 | - | 6.2 | 42-43 |
| Monel 500 | - | 2.4374 LN | - | - | 6.2 | 42-43 |
| Nimocast 713 | G - NiCr 13 Al 6 MoNb | 2.4670 LN | NC 13 AD | - | 6.3 | 44-45 |
| Nimocast PK24 | NiCo 15 Cr 10 MoAlTi | 2.4674 LN | NK 15 CAT | - | 6.3 | 44-45 |
| Nimonic 105 | NiCo 20 Cr 15 MoAlTi | 2.4634 | NCKD 20 ATV | - | 6.3 | 44-45 |
| Nimonic 80A | NiCr 20 TiAl | 2.4631 | NC 20 TA | - | 6.3 | 44-45 |
| Nimonic 90 | NiCr 20 Co 18 Ti | 2.4632 | - | - | 6.3 | 44-45 |
| Nimonic 901 | - | 2.4662 | Z 8 NCDT 42 | - | 6.3 | 44-45 |
| P 235 GH | H I | 1.0345 | A 37 CP; CC 12 | - | 1.1.2 | 22-23 |
| P 265 GH | H II | 1.0425 | A 42 CP; XC 25 | Fe 410 1 KW | 1.1.2 | 22-23 |
| P 285 NH | H III | 1.0435 | - | - | 1.1.2 | 22-23 |
| P 295 NH | H IV | 1.0445 | - | - | 1.1.2 | 22-23 |
| P 335 GH | 19 Mn 5 | 1.0482 | A 52 CP; AP; FP | - | 1.3.2 | 22-23 |
| P 355 N | StE 355 | 1.0582 | - | - | 1.1.4 | 22-23 |
| P 460 N | StE 460 | 1.8905 | E 460 RIFP; S 460 N | - | 1.1.4 | 22-23 |
| S 235 JRG 2 | St 37-2 | 1.0037 | E 24-2NE | Fe 360 B | 1.1.1 | 22-23 |
| S 255 N | StE 255 | 1.0461 | - | - | 1.1.4 | 22-23 |
| S 275 JR | St 44-2 | 1.0044 | E 28-2 | Fe 430 BFN | 1.1.1 | 22-23 |
| S 500 N | StE 500 | 1.8907 | - | - | 1.1.4 | 22-23 |
| Waspaloy | - | 2.6554 | - | - | 6.3 | 44-45 |
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| X 10 CrNiS 18 9 | X 10 CrNiS 18 9 | 1.4305 | Z 10 CNF 18-09 | X 10 CrNiS 18 9 | 1.6.1 | 28-29 |
| X 10 CrNiS 18 9 | X 10 CrNiS 18 9 | 1.4305 | Z 10 CNF 18-09 | X 10 CrNiS 18 9 | 1.6.1 | 28-29 |
| X 12 CrS 13 | X 12 CrS 13 | 1.4005 | Z 12 CF 13 | X 12 CrS 13 | 1.6.5/8.2 | 28 + 44 |
| X 14 CrMoS 17 | X 12 CrMoS 17 | 1.4104 | Z 10 CF 17; Z 6 CT 12 | X 12 CrMoS 17 | 1.6.1 | 28-29 |
| X 15 Cr 13 | X 15 Cr 13 | 1.4024 | - | X 15 Cr 13 | 1.6.5/8.2 | 28 + 44 |
| X 165 CrMoV 12 | X 165 CrMoV 12 | 1.2601 | - | X 165 CrMoV 12 KU | 1.5.2/8.2 | 24 + 44 |
| X 19 CrNi 17 2 | X 20 CrNi 17 2 | 1.4057 | Z 15 CN 16-02 | X 16 CrNi 16 | 1.6.5/8.2 | 28 + 44 |
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| X 2 CrNiN 18 10 | X 2 CrNiN 18 10 | 1.4311 | Z 2 CN 18-10 AZ | X 2 CrNiN 18 11 | 1.3.1 | 22-23 |
| X 20 Cr 13 | X 20 Cr 13 | 1.4021 | Z 20 C 13 | X 20 Cr 13 | 1.6.5/8.2 | 28 + 44 |
| X 210 Cr 12 | X 210 Cr 12 | 1.2080 | Z 200 C 12 | X 210 Cr 13 KU | 1.5.2/8.2 | 24 + 44 |
| X 210 CrW 12 | X 210 CrW 12 | 1.2436 | Z 200 CD 12 | X 215 CrW 12 1 KU | 1.5.2/8.2 | 24 + 44 |
| X 3 CrNiMoN 17 12 2 | X 2 CrNiMoN 17 12 2 | 1.4406 | Z 3 CND 17-12 AZ | X 2 CrNiMoN 17 12 | 1.3.1/1.6.2 | 22 + 23 |
| X 3 CrNiMoN 17 12 2 | X 2 CrNiMoN 17 12 2 | 1.4406 | Z 3 CND 17-12 AZ | X 2 CrNiMoN 17 12 | 1.3.1/1.6.2 | 26 + 27 |
| X 3 CrNiMoN 25 7 4 | X 3 CrNiMoN 25 7 4 | 1.4410 | Z 5 CND 20-10 M | - | 1.6.2 | 28-29 |
| X 30 Cr 13 | X 30 Cr 13 | 1.4028 | Z 30 C 13 | X 30 Cr 13 | 1.6.5/8.2 | 28 + 44 |
| X 36 CrMo 17 | X 36CrMo 17 | 1.2316 | - | X 38 CrMo 16 1 KU | 1.5.4/8.2 | 26 + 44 |
| X 38 CrMoV 5 1 | X 38CrMoV 5 1 | 1.2343 | Z 38 CDV 5 | X 37 CrMoV 5 1 KU | 1.5.5/8.2 | 26 + 44 |
| X 42 Cr 13 | X 42Cr 13 | 1.2083 | Z 40 C 14 | X 41 Cr 13 KU | 1.5.4/8.2 | 26 + 44 |
| X 45 CrSi 8 | X 45 CrSi 9 3 | 1.4718 | Z 45 CS 9 | X 45 CrSi 8 | 1.6.6/8.2 | 28 + 44 |
| X 46 Cr 13 | X 46 Cr 13 | 1.4034 | Z 44 C 14 | X 40 Cr 14 | 1.6.5/8.2 | 28 + 44 |
| X 5 CrNi 18 10 | X 5 CrNi 18 10 | 1.4301 | Z 6 CN 18-09 | X 5 CrNi 18 10 | 1.6.2 | 28-29 |
| X 6 Cr 13 | X 6 Cr 13 | 1.4000 | Z 6 C 13 | X 6 Cr 13 | 1.6.3 | 28-29 |
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| X 6 CrNi 18 9 | X 6 CrNi 18 9 | 1.4308 | Z 6 CN 18-10 M | GX 5 CrNi 19-10 | 1.6.2 | 28-29 |
| X 6 CrNiMo 18 10 | X 6 CrNiMo 18 10 | 1.4408 | GX 5 CrNiMo 19-11-2 | GX 5 CrNiMo 19-11-2 | 1.6.2 | 28-29 |
| X 6 CrNiMoTi 17 12 2 | X 6 CrNiMoTi 17 12 2 | 1.4571 | Z 6 CNDT 17-12-02 | X 6 CrNiMoTi 17 12 | 1.6.2 | 28-29 |
| X 6 CrNiTi 18 10 | X 6 CrNiTi 18 10 | 1.4541 | Z 6 CNT 18-10 | X 6 CrNiTi 18 10 | 1.6.2 | 28-29 |
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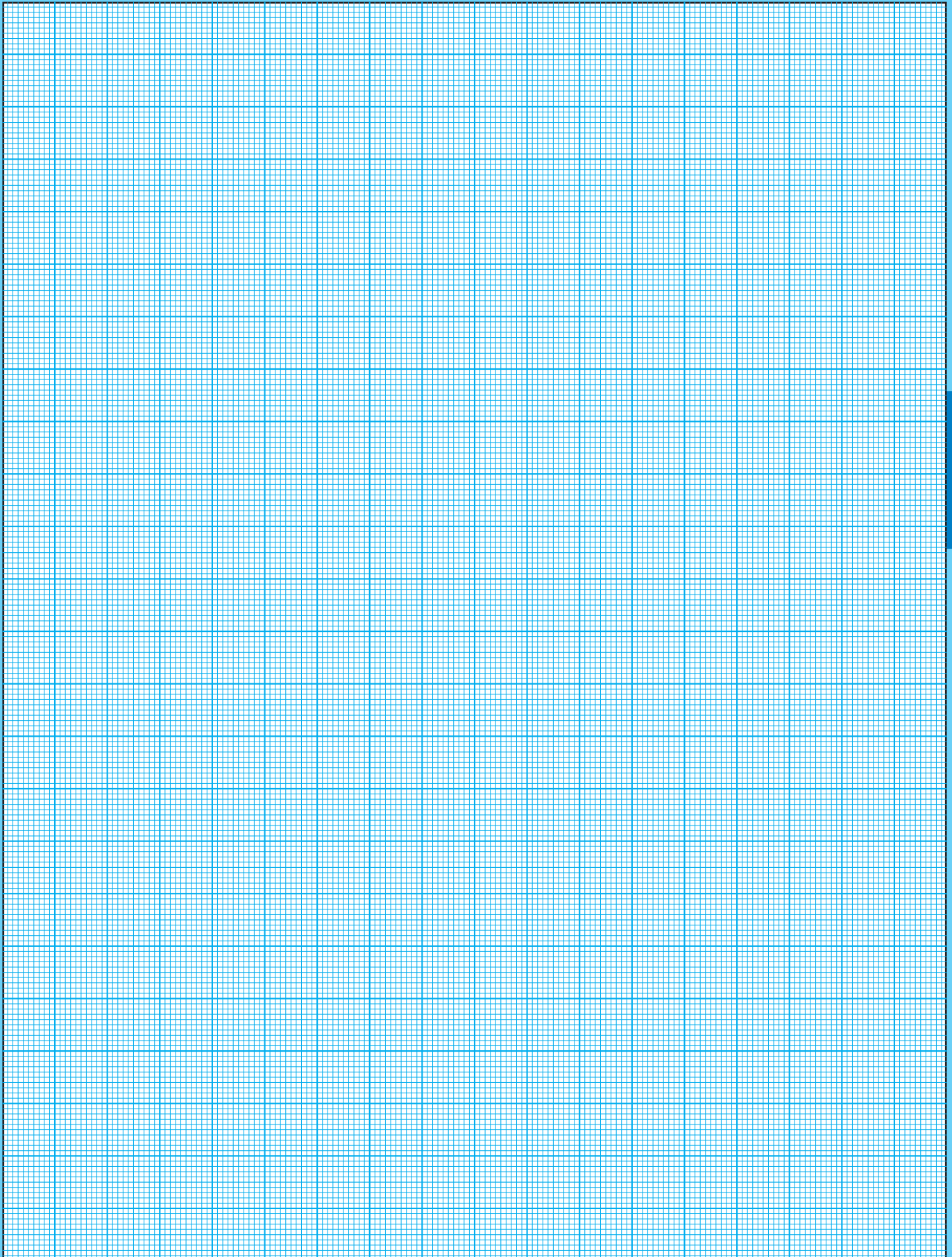


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| C 28 Mn | - | 1.4.1 | 24-25 |
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| C 30 | 2 C 30 | 1.2.2 | 22-23 |
| C 35 | 1 C 35 | 1.2.2 | 22-23 |
| C 35 | 2 C 35 | 1.2.2 | 22-23 |
| C 45 | 1 C 45 | 1.2.2 | 22-23 |
| C 45 | 2 C 45 | 1.2.2 | 22-23 |
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| C15E2C | C 15 KD | 1.2.4 | 22-23 |
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| C45EC | C 45 KD | 1.2.4 | 22-23 |
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| CF 9 SMn 28 | 11 SMn 28 | 1.2.3 | 22-23 |
| CF 9 SMn 36 | - | 1.2.3 | 22-23 |
| CF 9 SMnPb 28 | 11 SMnPb 28 | 1.2.3 | 22-23 |
| CF 9 SMnPb 36 | - | 1.2.3 | 22-23 |
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| Fe 430 D1(2) | Fe 430 D1(2); S 275 J2 G3 (4) | 1.1.1 | 22-23 |
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|----------------------|----------------------|-------|-------|
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| GMN 70 / P65-02 | GJMB-650-2 | 2.3 | 30-31 |
| GS 400-12 | GJS-400-15 | 2.3 | 30-31 |
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| X 10 CrNiS 18 9 | X 10 CrNiS 18 9 | 1.6.1 | 28-29 |
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| X 12 CrMoS 17 | X 14 CrMoS 17 | 1.6.1 | 28-29 |
| X 12 CrS 13 | X 12 CrS 13 | 1.6.5 | 28-29 |
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| X 5 CrNi 18 10 | X 5 CrNi 18 10 | 1.6.2 | 28-29 |
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| X 6 CrNiTi 18 10 | X 6 CrNiTi 18 10 | 1.6.2 | 28-29 |
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| X 6 CrTi 17 | - | 1.6.3 | 28-29 |
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| X 8 CrMo 17 | (X 8 CrMo 17) | 1.6.3 | 28-29 |
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Die vorgeschlagenen Werkzeuge sind in der Regel für den angegebenen Bearbeitungsfall geeignet. Aufgrund der Komplexität der Bearbeitungsparameter obliegt es jedoch dem Anwender, die Eignung des Werkzeugs im konkreten Bearbeitungsfall vor Ort zu überprüfen.

As a rule, the suggested tools are suitable for the shown application. Due to the complexity of process parameters, the user is in charge to check the suitability in the concrete case by himself.

Les outils proposés sont en principe appropriés pour l'usage indiqué. En vertu de la complexité des paramètres d'usinage il obtient à l'utilisateur de vérifier l'aptitude de l'outil dans le cas d'usinage concret sur place.

Gli utensili proposti sono normalmente adatti al caso di lavorazione richiesto. A causa delle complessità delle situazioni di lavoro e' comunque compito dell'utente utilizzare gli utensili secondo il tipo di applicazione specifica.

| M | | MF | | | MJ | | EG-M | G | UNC | UNJC | UNF | UNJF | UN-8 | PG | NPT |
|------------|-----------|------------|------------|----------|---------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| DIN 357 | | DIN 374 | | | DIN 371 | DIN 376 | DIN 40435 | DIN 5156 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 40432 | |
| ISO 2 6H | ISO 2 6H | ISO 3 6G | ISO 1 4H | ISO 1 4H | 6H mod | | | 2B | 3B | 2B | 3B | 2B | 3B | 2B | ANSI B 1.1 |
| | | 574437 148 | | | | | | 580403 149 | 520403 150 | | | 530403 151 | | | |
| | | 574403 147 | | | | | | | | | | | | | |
| | | 374190 118 | | | | | | | | | | | | | |
| | | 374103 122 | 374163 123 | | | 381103 110 | 980103 129 | 920103 133 | | 930103 136 | | | | | |
| | | | | | | | | 921103 133 | | | | | | | |
| 957100 86 | | 374100 117 | 374106 118 | | | | | 980100 127 | 920100 131 | | 930100 135 | | | | |
| | 357151 85 | | | | | | | | 921100 131 | | | | | | |
| | | 374200 119 | | | | | | 980200 127 | | | | | 910200 138 | 901200 138 | |
| | 357000 85 | | | | | | | | | | | | | | |
| | | 574737 148 | | | | | | 580703 149 | 520703 150 | | 530703 151 | | | | |
| | | 574703 147 | | | | | | | | | | | | | |
| | | 374343 124 | 374364 125 | | | | | | | | | | | | |
| | | 374390 121 | | | | | | | | | | | | | |
| 957053 104 | | 374303 124 | 374363 125 | | | 381303 111 | 980303 129 | 920303 134 | | 930303 136 | | 922303 137 | | | |
| | | | | | | | | 921303 134 | | | | | | | |
| 957300 87 | | 374300 120 | 374306 121 | | | | | 980300 128 | 920300 132 | | 930300 135 | | | | |
| | | | | | | | | | 921300 132 | | | | | | |
| 957150 86 | | 374150 120 | | | | | | 980150 128 | | | | | | | |
| | | 374200 119 | | | | | | 980200 127 | | | | | 910200 142 | 901200 138 | |
| | 357000 85 | | | | | | | | | | | | | | |
| | | 374754 202 | | | | | | | | | | | | | |
| | | 374604 203 | | | | | | | | | | | | | |
| 957504 201 | | 374504 202 | | | | | | 980504 203 | 920504 204 | | 930504 204 | | | | |
| | | 374891 209 | | | | | | 980891 210 | | | | | | | |

Oberflächenbehandlungen/Beschichtungen
Surface treatments/Coatings
Traitements de surface/Revêtements
Trattamenti superficiali/Rivestimenti

OX/NI-OX TIN TiCN TiAlN CrN Hardlube STiN

Eignung der Werkzeuge in der Reihenfolge von OBEN nach UNTEN.

Qualification of the tools in order TOP DOWN.

Sélection des outils : l'outils en première position est le plus approprié.

Utensili consigliati in ordine di preferenza, il primo e' il piu' adatto.

Anwendungstabelle






Application table




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| | V _c | DIN 352 | | | | | | DIN 371 | | | | | | DIN 376 | | | | | | | | |
| | | ≤1,5xd | ≤2,5xd | ≤3xd | ISO 2 6H | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | | |
|  | 175 | | | | | | | | | | | | | | | | | | | | | |
| | 18-25 | 18-22 | 15-18 | | | 900140* | 176 | | | | | | | | | | | | | | | |
| | 18-25 | 18-22 | 15-18 | | | 900141* | 176 | | | | | | | | | | | | | | | |
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| | 18-25 | 18-22 | 15-18 | | | 571104 | 155 | | | | | | | | | | | | | | | |
| | 18-25 | 18-22 | 15-18 | | | 571143 | 152 | | | | | | | | | | | | | | | |
| | 18-25 | 18-22 | 15-18 | | | 571403 | 139 | | 571463 | 141 | | | | | | | | | 576463 | 141 | | |
| | 15-22 | 15-18 | 12-15 | | | 371143 | 93 | | | | 371164 | 95 | | | | | | | 376143 | 93 | | |
| | 12-18 | 12-15 | 10-12 | | | 371193 | 92 | | | | | | | | | | | | 376193 | 92 | | |
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| | 10-15 | 10-12 | 8-10 | | | | | | | | 371163 | 94 | | | | | | | | | 376163 | 94 |
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| | 10-12 | | | | | | | | | | | | | | | | | | | | 376203 | 97 |
| |  | 175 | | | | | | | | | | | | | | | | | | | | |
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| 12-15 | | 12-15 | 10-12 | | | 571154 | 156 | | | | | | | | | | | | | | | |
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| 12-15 | | 12-15 | 10-12 | | | 571347 | 154 | | | | | | | | | | | | | | | |
| 12-15 | | 12-15 | 10-12 | | | 571737 | 143 | | | | | | | | | | | | | | | |
| 12-15 | | 12-15 | 10-12 | | | 571343 | 153 | | | | | | | | | | | | | | | |
| 12-15 | | 12-15 | 10-12 | | | 571703 | 142 | | | 571723 | 144 | | 571763 | 145 | | | | | 576703 | 142 | | |
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| | 10-12 | 10-12 | 8-10 | | | 371504 | 195 | | | 371204 | 197 | 371564 | 199 | 371574 | 200 | | | | | | 376504 | 195 |

  = **IKZ** Mit Innenkühlung · With internal coolant · Arrosage centralisé · Lubrificazione interna
 * =  Nur für Synchronbearbeitung · Only for rigid tapping · Uniquement pour le taraudage rigide · Solo per maschiatura rigida

Die vorgeschlagenen Werkzeuge sind in der Regel für den angegebenen Bearbeitungsfall geeignet. Aufgrund der Komplexität der Bearbeitungsparameter obliegt es jedoch dem Anwender, die Eignung des Werkzeugs im konkreten Bearbeitungsfall vor Ort zu überprüfen.

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| M | | MF | | | MJ | | EG-M | G | UNC | UNJC | UNF | UNJF | UN-8 | PG | NPT |
|------------|----------|------------|------------|------------|----------|----------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|
| | DIN 357 | DIN 374 | | | DIN 371 | DIN 376 | DIN 40435 | DIN 5156 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 40432 | |
| | ISO 2 6H | ISO 2 6H | ISO 3 6G | | ISO 1 4H | ISO 1 4H | 6H mod | | 2B | 3B | 2B | 3B | 2B | DIN 40430 | ANSI B 1.1 |
| | | 574437 148 | | | | | | | | | | | | | |
| | | 574403 147 | | | | | | 580403 149 | 520403 150 | | 530403 151 | | | | |
| | | | 374103 122 | 374163 123 | | | | 980103 129 | 920103 133 | | | | | | |
| | | | | | | | | | 921103 133 | | | | | | |
| | | 574737 148 | | | | | | | | | | | | | |
| | | 574703 147 | | | | | | 580703 149 | 520703 150 | | 530703 151 | | | | |
| | | 374343 124 | 374364 125 | | | | | | | | | | | | |
| | | 374390 121 | | | | | | | | | | | | | |
| 957053 104 | | 374303 124 | 374363 125 | | | | 381303 111 | 980303 129 | 920303 134 | | 930303 136 | | 922303 137 | | |
| | | | | | | | | | 921303 134 | | | | | | |
| | | 374754 202 | | | | | | | | | | | | | |
| | | 374604 203 | | | | | | | | | | | | | |
| 957504 201 | | 374504 202 | | | | | | 980504 203 | 920504 204 | | 930504 204 | | | | |



Oberflächenbehandlungen/Beschichtungen
 Surface treatments/Coatings
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 Trattamenti superficiali/Rivestimenti

Eignung der Werkzeuge in der Reihenfolge von OBEN nach UNTEN.

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Utensili consigliati in ordine di preferenza, il primo e' il piu' adatto.

Anwendungstabelle











Application table


Tableau d'application


Tabella di applicazione

MAT

1.4.5-1.4.8 / 1.5.4-1.5.5

|   | M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---------|--------|------|-------------|-------------|-------------|-----|---|-------------|---------|-------------|-------------|-----|---|-------------|----|-------------|-------------|---------|---|-------------|--------|-----|--------|-----|--------|-----|--|--|--|--|--|--|
| | V _c | DIN 352 | | | | | | | | | DIN 371 | | | | | | | | | DIN 376 | | | | | | | | | | | | | | |
| | | ≤1,5xd | ≤2,5xd | ≤3xd | ISO 2 6H | ISO 1 4H | ISO 2 6H | LH |  | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH |  | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH |  | ISO 3 6G | 7G | | | | | | | | | | | |
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| | 13-18 | 12-17 | 10-14 | | | 571403 | 139 | | | | 571463 | 141 | | | | | | | 576403 | 139 | | | | | 576463 | 141 | | | | | | | | |
| | 12-15 | 10-14 | 9-12 | | | 371143 | 93 | | | | 371164 | 95 | | | | | | | 376143 | 93 | | | | | 376164 | 95 | | | | | | | | |
| | 12-14 | 9-12 | 8-10 | | | 371193 | 92 | | | | | | | | | | | | 376193 | 92 | | | | | | | | | | | | | | |
| | 10-12 | 8-10 | 8-9 | | 371801 | 90 | 371103 | 91 | | | | | | | | | | | 376103 | 91 | | | | | 376163 | 94 | | | | | | | | |
| | 10-12 | 8-10 | 8-9 | | | | 371105 | 96 | | | | | | | | | | | 376105 | 96 | | | | | | | | | | | | | | |
| | 10-12 | 8-10 | 8-9 | | | | 371203 | 97 | | | | | | | | | | | 376203 | 97 | | | | | | | | | | | | | | |
|  |  | | | | | 900447* | 177 | | | | | | | | | | | | 900447* | 177 | | | | | | | | | | | | | | |
| | 12-15 | 12-15 | 10-12 | | | 900440* | 177 | | | | | | | | | | | | 900440* | 177 | | | | | | | | | | | | | | |
| | 12-15 | 12-15 | 10-12 | | | 571347 | 154 | | | | | | | | | | | | 576347 | 154 | | | | | | | | | | | | | | |
| | 12-15 | 12-15 | 10-12 | | | 571737 | 143 | | | | | | | | | | | | 576737 | 143 | | | | | | | | | | | | | | |
| | 12-15 | 12-15 | 10-12 | | | 571603 | 146 | | | | | | | | | | | | 576603 | 146 | | | | | | | | | | | | | | |
| | 12-15 | 12-15 | 10-12 | | | 571343 | 153 | | | | | | | | | | | | 576343 | 153 | | | | | | | | | | | | | | |
| | 12-15 | 12-15 | 10-12 | | | 571703 | 142 | | | 571723 | 144 | 571763 | 145 | | | | | | 576703 | 142 | | | 576723 | 144 | 576763 | 145 | | | | | | | | |
| | 10-12 | 10-12 | 8-10 | | | 371343 | 106 | | | | | 371364 | 108 | | | | | | 376343 | 106 | | | | | 376364 | 108 | | | | | | | | |
| | 10-12 | 8-10 | 6-8 | | | 371393 | 105 | | | | | | | | | | | | 376393 | 105 | | | | | | | | | | | | | | |
| | 6-8 | 6-8 | 5-6 | | 970053 | 67 | | | | | | | | | | | | | 376053 | 103 | | | | | | | | | | | | | | |
| | 6-8 | 6-8 | | | | | 371313 | 101 | | | | | | | | | | | 376313 | 101 | | | | | | | | | | | | | | |
| | 6-8 | 6-8 | | | 371803 | 99 | 371303 | 100 | | | 371323 | 102 | 371363 | 107 | | | | | 376303 | 100 | | | 376323 | 102 | 376363 | 107 | | | | | | | | |
| | 6-8 | 6-8 | | | | | 371305 | 109 | | | | | | | | | | | 376305 | 109 | | | | | | | | | | | | | | |
| | 6-8 | | | | | | 371153 | 98 | | | | | | | | | | | 376153 | 98 | | | | | | | | | | | | | | |
| | 5-6 | | | | | | 371203 | 97 | | | | | | | | | | | 376203 | 97 | | | | | | | | | | | | | | |
|  | 8-10 | 8-10 | 8-10 | | | | 371754 | 196 | | | | | | | | | | | 376754 | 196 | | | | | | | | | | | | | | |
| | 8-10 | 8-10 | 8-10 | | | | 371604 | 198 | | | | | | | | | | | 376604 | 198 | | | | | | | | | | | | | | |
| | 8-10 | 8-10 | 8-10 | | | | 371504 | 195 | | | 371204 | 197 | 371564 | 199 | 371574 | 200 | | | 376504 | 195 | | | 376204 | 197 | 376564 | 199 | 376574 | 200 | | | | | | |

 = **IKZ** Mit Innenkühlung · With internal coolant · Arrosage centralisé · Lubrificazione interna

* =  Nur für Synchronbearbeitung · Only for rigid tapping · Uniquement pour le taraudage rigide · Solo per maschiatura rigida

Die vorgeschlagenen Werkzeuge sind in der Regel für den angegebenen Bearbeitungsfall geeignet. Aufgrund der Komplexität der Bearbeitungsparameter obliegt es jedoch dem Anwender, die Eignung des Werkzeugs im konkreten Bearbeitungsfall vor Ort zu überprüfen.

As a rule, the suggested tools are suitable for the shown application. Due to the complexity of process parameters, the user is in charge to check the suitability in the concrete case by himself.

Les outils proposés sont en principe appropriés pour l'usage indiqué. En vertu de la complexité des paramètres d'usinage il appartient à l'utilisateur de vérifier l'aptitude de l'outil dans le cas d'usinage concret sur place.

Gli utensili proposti sono normalmente adatti al caso di lavorazione richiesto. A causa delle complessità delle situazioni di lavoro e' comunque compito dell'utente utilizzare gli utensili secondo il tipo di applicazione specifica.

| M | | MF | | | MJ | | EG-M | G | UNC | | UNJC | UNF | UNJF | UN-8 | | PG | NPT | |
|--------|----------|---------|----------|--------|----------|---------|-----------|----------|------------|-----|------------|------------|------------|------------|-----------|-----------|------------|-----|
| | DIN 357 | DIN 374 | | | DIN 371 | DIN 376 | DIN 40435 | DIN 5156 | DIN 2184-1 | | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 40432 | | | |
| | ISO 2 6H | | ISO 2 6H | | ISO 3 6G | | ISO 1 4H | | | | | | | | | DIN 40430 | ANSI B 1.1 | |
| | | | | | | | | | | | | | | | | | | |
| | | 574437 | 148 | | | | | | | | | | | | | | | |
| | | 574403 | 147 | | | | | | 580403 | 149 | 520403 | 150 | | 530403 | 151 | | | |
| | | | | | | | | | | | | | | 137 | | | | |
| | | 374103 | 122 | 374163 | 123 | | | | 980103 | 129 | 920103 | 133 | | | | | | |
| | | | | | | | | | | | 921103 | 133 | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | 574737 | 148 | | | | | | | | | | | | | | | |
| | | 574703 | 147 | | | | | | 580703 | 149 | 520703 | 150 | | 530703 | 151 | | | |
| | | 374343 | 124 | 374364 | 125 | | | | | | | | | | | | | |
| | | 374390 | 121 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| 957053 | 104 | 374303 | 124 | 374363 | 125 | | 381303 | 111 | 980303 | 129 | 920303 | 134 | | 930303 | 136 | | 922303 | 137 |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | 374754 | 202 | | | | | | | | | | | | | | | |
| | | 374604 | 203 | | | | | | | | | | | | | | | |
| 957504 | 201 | 374504 | 202 | | | | | | 980504 | 203 | 920504 | 204 | | 930504 | 204 | | | |



Oberflächenbehandlungen/Beschichtungen
 Surface treatments/Coatings
 Traitements de surface/Revêtements
 Trattamenti superficiali/Rivestimenti

Eignung der Werkzeuge in der Reihenfolge von OBEN nach UNTEN.
 Qualification of the tools in order TOP DOWN.
 Sélection des outils : l'outils en première position est le plus approprié.
 Utensili consigliati in ordine di preferenza, il primo e' il piu' adatto.











Anwendungstabelle



Application table

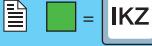
Tableau d'application


Tabella di applicazione

MAT 1.6

|   | M | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|-------|----------|----------|----------|---------|---|----------|--------|----------|----------|--------|---|----------|-----|----------|----------|----|---|----------|----|--|--|--|--|--|
| | V _c | | | DIN 352 | | | | | | | DIN 371 | | | | | | | DIN 376 | | | | | | | | | |
| | ≤1,5xd | ≤2,5xd | ≤3xd | ISO 2 6H | ISO 1 4H | ISO 2 6H | LH |  | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH |  | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH |  | ISO 3 6G | 7G | | | | | |
|  |  | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | 900140* | 176 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | 900141* | 176 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | 571437 | 140 | | | | | | | | | | | | | | | | | | | |
| | | 15~20 | 15~18 | 12~15 | | | 571143 | 152 | | | | | | | | | | | | | | | | | | | |
| | | 15~20 | 15~18 | 12~15 | | | 571403 | 139 | | | 571463 | 141 | | | | | | | | | | | | | | | |
| | | 12~18 | 12~15 | 10~12 | | | 571143 | 93 | | | 371164 | 95 | | | | | | | | | | | | | | | |
| | | 10~15 | 10~12 | 8~10 | | | 371193 | 92 | | | | | | | | | | | | | | | | | | | |
| | | 8~12 | 8~10 | 6~8 | | | 371801 | 90 | 371103 | 91 | | | | | | | | | | | | | | | | | |
| | | 8~12 | 8~10 | 6~8 | | | | | 371105 | 96 | | | | | | | | | | | | | | | | | |
| | | 8~10 | | | | | | | 371203 | 97 | | | | | | | | | | | | | | | | | |
| |  |  | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | 900447* | 177 | | | | | | | | | | | | | | | | | | |
| | | | | | | | | 900440* | 177 | | | | | | | | | | | | | | | | | | |
| | | | | | | | | 571347 | 154 | | | | | | | | | | | | | | | | | | |
| | | 15~18 | 12~15 | 10~12 | | | 571737 | 143 | | | | | | | | | | | | | | | | | | | |
| | | 12~15 | 10~12 | 8~10 | | | 571343 | 153 | | | | | | | | | | | | | | | | | | | |
| | | 12~15 | 10~12 | 8~10 | | | 571703 | 142 | | | 571723 | 144 | 571763 | 145 | | | | | | | | | | | | | |
| | | 10~12 | 8~10 | 6~8 | | | 371343 | 106 | | | 371364 | 108 | | | | | | | | | | | | | | | |
| | | 8~10 | 6~8 | 5~6 | | | 371393 | 105 | | | | | | | | | | | | | | | | | | | |
| | | 6~8 | 5~6 | 4~5 | | | 970053 | 67 | | | | | | | | | | | | | | | | | | | |
| | | 6~8 | 5~6 | | | | | | 371053 | 103 | | | | | | | | | | | | | | | | | |
| | | 6~8 | 5~6 | | | | | | 371313 | 101 | | | | | | | | | | | | | | | | | |
| | | 6~8 | 5~6 | | | | | | 371803 | 99 | 371303 | 100 | | | 371323 | 102 | 371363 | 107 | | | | | | | | | |
| | | 6~8 | 5~6 | | | | | | | | 371305 | 109 | | | | | | | | | | | | | | | |
| | | 6~8 | 5~6 | | | | | | | | 371153 | 98 | | | | | | | | | | | | | | | |
| | 6~8 | | | | | | | | | 371203 | 97 | | | | | | | | | | | | | | | | |
|  | 15~20 | 15~18 | 12~15 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |

|   | V _c | | M | | | | | | | MF | | | | G | | | | | | | | | | | |
|--|----------------|--------|----------|----------|--------|----------|--------|----------|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | ≤2xd | | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | ISO 2 6H | ISO 3 6G | | | | | | | | | | | | | | | | |
| | 215 | 215 | 215 | 215 | 215 | 215 | 215 | 215 | 215 | 215 | 215 | | | | | | | | | | | | | | |
| | 914445 | 914440 | 914445 | 914440 | 914445 | 914440 | 914445 | 914440 | 914445 | 914440 | 914445 | 914440 | 914445 | 914440 | 914445 | 914440 | 914445 | 914440 | 914445 | 914440 | 914445 | 914440 | 914445 | 914440 | 914445 |

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| M | | MF | | | MJ | | EG-M | | G | UNC | UNJC | UNF | UNJF | UN-8 | PG | NPT | | | | | | | | | | |
|--------|----------|---------|----------|-----|----------|---------|-----------|----------|------------|------------|------------|------------|------------|------------|-----------|-----|--------|-----|----|--|----|--|-----------|-----|------------|--|
| | DIN 357 | DIN 374 | | | DIN 371 | DIN 376 | DIN 40435 | DIN 5156 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 40432 | | | | | | | | | | | |
| | ISO 2 6H | | ISO 2 6H | | ISO 3 6G | | ISO 1 4H | | ISO 1 4H | | 6H mod | | 2B | | 3B | | 2B | | 3B | | 2B | | DIN 40430 | | ANSI B 1.1 | |
| | | | 574437 | 148 | | | | | | | | | | | | | | | | | | | | | | |
| | | | 574403 | 147 | | | | | 580403 | 149 | 520403 | 150 | | 530403 | 151 | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 374103 | 122 | 374163 | 123 | | | 381103 | 110 | 980103 | 129 | 920103 | 133 | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 574737 | 148 | | | | | | | | | | | | | | | | | | | | | | |
| | | | 574703 | 147 | | | | | 580703 | 149 | 520703 | 150 | | 530703 | 151 | | | | | | | | | | | |
| | | | 374343 | 124 | 374364 | 125 | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 957053 | 104 | | 374303 | 124 | 374363 | 125 | | | 381303 | 111 | 980303 | 129 | 920303 | 134 | | | 930303 | 136 | | | | | 922303 | 137 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 374891 | 209 | | | | | | | | | | | | | | | | | | | | | | |



Oberflächenbehandlungen/Beschichtungen
Surface treatments/Coatings
Traitements de surface/Revêtements
Trattamenti superficiali/Rivestimenti

Eignung der Werkzeuge in der Reihenfolge von OBEN nach UNTEN.

Qualification of the tools in order TOP DOWN.




Sélection des outils : l'outils en première position est le plus approprié.



Utensili consigliati in ordine di preferenza, il primo e' il piu' adatto.


Anwendungstabelle Application table Tableau d'application Tabella di applicazione

MAT

2.1-2.4/4.4 / 4.5/7.2/7.3

|   | M | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|----------------|--------|---------|-------------|-------------|-------------|--------|----------------|-------------|--------|-------------|-------------|----|----------------|-------------|----|-------------|-------------|----|----------------|-------------|--------|-----|--------|-----|--------|-----|
| | V _c | | DIN 352 | | | | | | DIN 371 | | | | | | | | DIN 376 | | | | | | | | | | |
| | ≤1,5xd | ≤2,5xd | ≤3xd | ISO 2 6H | ISO 1 4H | ISO 2 6H | LH | E ₂ | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | E ₂ | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | E ₂ | ISO 3 6G | 7G | | | | | |
|  | 22~26 | 18~22 | | | | 371241 | 116 | | | | | | | | | | | | | | 376241 | 116 | | | | | |
| | 18~22 | 15~18 | | | | 371291 | 115 | | | | | | | | | | | | | | 376291 | 115 | | | | | |
| | 15~18 | 12~15 | | | | 371201 | 114 | | | | | | | | | | | | | | 376201 | 114 | | | | | |
| | 26~32 | 22~26 | 18~22 | | | 571104 | 155 | | | | | | | | | | | | | | 576104 | 155 | | | | | |
| | 22~26 | 18~22 | 15~18 | | | 571437 | 140 | | | | | | | | | | | | | | 576437 | 140 | | | | | |
| | 22~26 | 18~22 | 15~18 | | | 571403 | 139 | | | 571463 | 141 | | | | | | | | | | 576403 | 139 | | 576463 | 141 | | |
| | 22~26 | 18~22 | 15~18 | | | 571143 | 152 | | | | | | | | | | | | | | 576143 | 152 | | | | | |
| | | | | | | 900140* | 176 | | | | | | | | | | | | | | 900140* | 176 | | | | | |
| | | | | | | 900141* | 176 | | | | | | | | | | | | | | 900141* | 176 | | | | | |
| | 18~22 | 15~18 | 12~15 | | | 371143 | 93 | | | 371164 | 95 | | | | | | | | | | 376143 | 93 | | 376164 | 95 | | |
| | 12~15 | 10~12 | | | | 371203 | 97 | | | | | | | | | | | | | | 376203 | 97 | | | | | |
| | 12~15 | 10~12 | 8~10 | | | 371801 | 90 | 371103 | 91 | | | 371163 | 94 | | | | | | | | 376103 | 91 | | 376163 | 94 | | |
| | 12~15 | 10~12 | 8~10 | | | | | | | | | | | | | | | | | | | | | | | | |
| | 22~26 | 18~22 | | | | 371241 | 116 | | | | | | | | | | | | | | | 376241 | 116 | | | | |
| | 18~22 | 15~18 | | | | 371291 | 115 | | | | | | | | | | | | | | | 376291 | 115 | | | | |
| | 15~18 | 12~15 | | | | 371201 | 114 | | | | | | | | | | | | | | | 376201 | 114 | | | | |
| 22~26 | 18~22 | 15~18 | | | 571154 | 156 | | | | | | | | | | | | | | | 576154 | 156 | | | | | |
| 18~22 | 15~18 | 12~15 | | | 571603 | 146 | | | | | | | | | | | | | | | 576603 | 146 | | | | | |
| 18~22 | 15~18 | 12~15 | | | 571737 | 143 | | | | | | | | | | | | | | | 576737 | 143 | | | | | |
| 18~22 | 15~18 | 12~15 | | | 571347 | 154 | | | | | | | | | | | | | | | 576347 | 154 | | | | | |
| 18~22 | 15~18 | 12~15 | | | 571343 | 153 | | | | | | | | | | | | | | | 576343 | 153 | | | | | |
| 18~22 | 15~18 | 12~15 | | | 571703 | 142 | | | 571723 | 144 | 571763 | 145 | | | | | | | | | 576703 | 142 | | 576723 | 144 | 576763 | 145 |
| 18~22 | 15~18 | 12~15 | | | 571343 | 153 | | | | | | | | | | | | | | | 576343 | 153 | | | | | |
| | | | | | 900447* | 177 | | | | | | | | | | | | | | | 900447* | 177 | | | | | |
| | | | | | 900440* | 177 | | | | | | | | | | | | | | | 900440* | 177 | | | | | |
| 15~18 | 12~15 | | | | 371343 | 106 | | | 371364 | 108 | | | | | | | | | | | 376343 | 106 | | 376364 | 108 | | |
| 10~12 | 8~10 | | | | 371203 | 97 | | | | | | | | | | | | | | | 376203 | 97 | | | | | |
| 10~12 | 8~10 | | | | 371153 | 98 | | | | | | | | | | | | | | | 376153 | 98 | | | | | |
| 10~12 | 8~10 | | | | 371803 | 99 | 371303 | 100 | | | 371363 | 107 | | | | | | | | | 376303 | 100 | | 376363 | 107 | | |
| 10~12 | 8~10 | | | | | | | | | | | | | | | | | | | | | | | | | | |

|   | V _c | | M | | | | | | | | MF | | | | G | | | | | | | | | | | | | |
|--|----------------|-----|-------------|-------------|--------|-------------|--------|-------------|-------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----|--|--|--|--|--|--|--|--|
| | ≤2xd | | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | ISO 2 6H | ISO 3 6G | | | | | | | | | | | | | | | | | | | |
| | | | 215 | 914445 | 216 | 914445 | 216 | 914445 | 216 | 914445 | 216 | 914445 | 216 | 914445 | 216 | 914445 | 216 | 914445 | 216 | | | | | | | | | |
| | | 215 | 914440 | 215 | 914440 | 215 | 914440 | 215 | 914440 | 215 | 914440 | 215 | 914440 | 215 | 914440 | 215 | 914440 | 215 | 914440 | 215 | | | | | | | | |

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| M | | MF | | | MJ | | EG-M | G | UNC | UNJC | UNF | UNJF | UN-8 | PG | NPT |
|--------|----------|---------|----------|--------|----------|---------|-----------|----------|------------|------------|------------|------------|------------|-----------|------------|
| | DIN 357 | DIN 374 | | | DIN 371 | DIN 376 | DIN 40435 | DIN 5156 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 40432 | |
| | ISO 2 6H | | ISO 2 6H | | ISO 3 6G | | ISO 1 4H | 6H mod | | 2B | 3B | 2B | 3B | 2B | ANSI B 1.1 |
| | | 374241 | 126 | | | | | | | | | | | | |
| | | 374201 | 126 | | | | | 980201 | 130 | | | | | | |
| | | 574437 | 148 | | | | | 580403 | 149 | 520403 | 150 | 530403 | 151 | | |
| | | 574403 | 147 | | | | | | | | | | | | |
| | | | | 374164 | 123 | | | | | | | | | | |
| | | | | 374163 | 123 | | | 381103 | 110 | 920103 | 133 | 930103 | 136 | | |
| | | | | | | | | | | 921103 | 133 | | | | |
| | | 374241 | 126 | | | | | | | | | | | | |
| | | 374201 | 126 | | | | | 980201 | 130 | | | | | | |
| | | | | 574737 | 148 | | | 580703 | 149 | 520703 | 150 | 530703 | 151 | | |
| | | | | 574703 | 147 | | | | | | | | | | |
| | | | | 374343 | 124 | 374364 | 125 | | | | | | | | |
| 957053 | 104 | | | | | 374363 | 125 | 381303 | 111 | 920303 | 134 | 930303 | 136 | | |
| | | | | | | | | | | 921303 | 134 | | | | |



Oberflächenbehandlungen/Beschichtungen
Surface treatments/Coatings
Traitements de surface/Revêtements
Trattamenti superficiali/Rivestimenti

OX/NI-OX **TIN** **TICN** **TAIIN** CrN **Hardlube** **STIN**

Eignung der Werkzeuge in der Reihenfolge von OBEN nach UNTEN.

Qualification of the tools in order TOP DOWN.

Sélection des outils : l'outils en première position est le plus approprié.

Utensili consigliati in ordine di preferenza, il primo e' il piu' adatto.







Anwendungstabelle


Application table

Tableau d'application

Tabella di applicazione

MAT 3.1 / 3.3

| | | M | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|-------|----------|----------|----------|---------|-------------------|----------|----|----------|----------|--------|-------------------|----------|-----|----------|----------|---------|-------------------|----------|--------|--------|--------|--------|--------|----|
| | | Vc | | | DIN 352 | | | | | | | | DIN 371 | | | | | | | | DIN 376 | | | | | | | |
| | | ≤1,5xd | ≤2,5xd | ≤3xd | ISO 2 6H | ISO 1 4H | ISO 2 6H | LH | E ₁₅₋₂ | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | E ₁₅₋₂ | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | E ₁₅₋₂ | ISO 3 6G | 7G | | | | | |
|  |  | 175 | | | | | 900140* | 176 | | | | | | | | | | | | 900140* | 176 | | | | | | | |
| | | | | | | | | 900141* | 176 | | | | | | | | | | | | 900141* | 176 | | | | | | |
| | | 40-50 | 32-40 | 26-32 | | | | 571437 | 140 | | | | | | | | | | | | 576437 | 140 | | | | | | |
| | | 32-40 | 26-32 | 22-26 | | | | 571143 | 152 | | | | | | | | | | | | 576143 | 152 | | | | | | |
| | | 32-40 | 26-32 | 22-26 | | | | 571403 | 139 | | | 571463 | 141 | | | | | | | | 576403 | 139 | | | 576463 | 141 | | |
| | | 26-32 | 22-26 | 18-22 | | | | 371143 | 93 | | | 371164 | 95 | | | | | | | | 376143 | 93 | | | 376164 | 95 | | |
| | | 22-26 | 18-22 | 15-18 | | | | 371140 | 113 | | | 371140 | 113 | | | | | | | | 376400 | 113 | | | | | | |
| | | 22-26 | 18-22 | 15-18 | | | | 371105 | 96 | | | | | | | | | | | | 376105 | 96 | | | | | | |
| | | 18-22 | 15-18 | 12-15 | | 970100 | 66 | | | 371100 | 70 | 371108 | 72 | | | | | | | 371106 | 73 | 371170 | 74 | | | | | |
| | | 18-22 | 15-18 | 12-15 | | | | | | | | | | | | | | | | | 376100 | 70 | 376108 | 72 | | 376106 | 73 | |
| | | 18-22 | 15-18 | 12-15 | | | | | | | | | | | | | | | | | | | | | | | 376170 | 74 |
| | | 18-22 | 15-18 | 12-15 | | | | | | 371151 | 75 | | | | | | | | | | 376151 | 75 | | | | | | |
| | | 15-18 | | | | | | | | 371200 | 76 | | | | | | | | | | 376200 | 76 | | | | | | |
| | | 15-18 | | | | | | | | 371700 | 77 | | | | | | | | | | 376700 | 77 | | | | | | |
| | |  |  | 175 | | | | | 900447* | 177 | | | | | | | | | | | | 900447* | 177 | | | | | |
| | | | | | | | | 900410* | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | 900440* | 177 | | | | | | | | | | | | 900440* | 177 | | | | | | |
| 32-40 | 26-32 | | | 22-26 | | | | 571347 | 154 | | | | | | | | | | | | 576347 | 154 | | | | | | |
| 32-40 | 26-32 | | | 22-26 | | | | 571737 | 143 | | | | | | | | | | | | 576737 | 143 | | | | | | |
| 26-32 | 22-26 | | | 18-22 | | | | 571343 | 153 | | | | | | | | | | | | 576343 | 153 | | | | | | |
| 26-32 | 22-26 | | | 18-22 | | | | 571703 | 142 | | | 571723 | 144 | 571763 | 145 | | | | | | 576703 | 142 | | | 576723 | 144 | | |
| 22-26 | 18-22 | | | 15-18 | | | | 371343 | 106 | | | | | 371364 | 108 | | | | | | 376343 | 106 | | | 376364 | 108 | | |
| 22-26 | 18-22 | | | 15-18 | | | | 571603 | 146 | | | | | | | | | | | | 576603 | 146 | | | | | | |
| 22-26 | 18-22 | | | 15-18 | | | | 371400 | 113 | | | | | | | | | | | | 376400 | 113 | | | | | | |
| 18-22 | 15-18 | | | 10-12 | | | | 371305 | 109 | | | | | | | | | | | | 376305 | 109 | | | | | | |
| 12-15 | 10-12 | | | | | 970300 | 67 | | | 371300 | 79 | 371308 | 82 | 371320 | 80 | 371306 | 83 | 371370 | 84 | | 376300 | 79 | 376308 | 82 | 376320 | 80 | | |
| 12-15 | 10-12 | | | | | | | | | | | | | | | | | | | | 376320 | 80 | | | | | | |
| 12-15 | | | | | | 970150 | 66 | | | 371150 | 78 | | | | | | | | | | 376150 | 78 | | | | | | |
| 12-15 | | | | | | | | | | 371200 | 76 | | | | | | | | | | 376200 | 76 | | | | | | |
| 12-15 | | | | | | | | 371700 | 77 | | | | | | | | | | 376700 | 77 | | | | | | | | |
|  |  | 50-60 | 40-50 | 32-40 | | | | 914851 | 211 | | | | | | | | | | 914851 | 211 | | | | | | | | |
| | | 40-50 | 32-40 | 26-32 | | | | 371791 | 206 | | | | 371792 | 208 | | | | | | 376791 | 206 | | | | | | | |
| | | 32-40 | 26-32 | 22-26 | | | | 371891 | 205 | | | | 371892 | 207 | | | | | | 376891 | 205 | | | 376892 | 207 | | | |
| | | 18-22 | 18-22 | 15-18 | | | | 371754 | 196 | | | | | | | | | | | | 376754 | 196 | | | | | | |
| | | 18-22 | 15-18 | 15-18 | | | | 371604 | 198 | | | | | | | | | | | | 376604 | 198 | | | | | | |
| | | 18-22 | 15-18 | 15-18 | | | | 371504 | 195 | | | 371204 | 197 | 371564 | 199 | 371574 | 200 | | | | 376504 | 195 | | 376204 | 197 | 376564 | 199 | |

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| M | | MF | | | MJ | | EG-M | G | UNC | UNJC | UNF | UNJF | UN-8 | PG | NPT |
|--------|----------|---------|----------|-----|----------|---------|-----------|----------|------------|------------|------------|------------|------------|-----------|-----|
| | DIN 357 | DIN 374 | | | DIN 371 | DIN 376 | DIN 40435 | DIN 5156 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 40432 | |
| | ISO 2 6H | | ISO 2 6H | | ISO 3 6G | | ISO 1 4H | | ISO 1 4H | | 6H mod | | | | |
| | | | | | | | | | | | | | | | |
| | | | 574437 | 148 | | | | | | | | | | | |
| | | | 574403 | 147 | | | | 580403 | 149 | 520403 | 150 | | 530403 | 151 | |
| 957100 | 86 | | 374100 | 117 | 374106 | 118 | | 980100 | 127 | 920100 | 131 | | 930100 | 135 | |
| | | | | | | | | | | 921100 | 131 | | | | |
| | 357151 | 85 | | | | | | | | | | | | | |
| | | | 374200 | 119 | | | | 980200 | 127 | | | | | 910200 | 138 |
| | 357000 | 85 | | | | | | | | | | | | 901200 | 138 |
| | | | | | | | | | | | | | | | |
| | | | 574737 | 148 | | | | | | | | | | | |
| | | | 574703 | 147 | | | | 580703 | 149 | 520703 | 150 | | 530703 | 151 | |
| | | | 374343 | 124 | 374364 | 125 | | | | | | | | | |
| 957300 | 87 | | 374300 | 120 | 374306 | 121 | | 980300 | 128 | 920300 | 132 | | 930300 | 135 | |
| | | | | | | | | | | 921300 | 132 | | | | |
| 957150 | 86 | | 374150 | 120 | | | | 980150 | 128 | | | | | | |
| | | | 374200 | 119 | | | | 980200 | 127 | | | | | 910200 | 138 |
| | 357000 | 85 | | | | | | | | | | | | 901200 | 138 |
| | | | | | | | | | | | | | | | |
| | | | 374891 | 209 | | | | 980891 | 210 | | | | | | |
| | | | 374754 | 202 | | | | | | | | | | | |
| | | | 374604 | 203 | | | | | | | | | | | |
| 957504 | 201 | | 374504 | 202 | | | | 980504 | 203 | 920504 | 204 | | 930504 | 204 | |



Oberflächenbehandlungen/Beschichtungen
Surface treatments/Coatings
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Sélection des outils : l'outils en première position est le plus approprié.


Utensili consigliati in ordine di preferenza, il primo e' il piu' adatto.


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MAT 3.2/3.5/3.6

|  | | M | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------|--------|--------|---------|----------|----------|----------|----|----------|--------|----------|----------|----|----------|-----|----------|----------|--------|----------|---------|--|--|--|--|--|--|--|
| | | Vc | | DIN 352 | | | | | | | | DIN 371 | | | | | | | | DIN 376 | | | | | | | |
| | | ≤1,5xd | ≤2,5xd | ≤3xd | ISO 2 6H | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | | | | | | | |
|  | 175 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 18~26 | 18~22 | 15~18 | | | 900140* | 176 | | | | | | | | | | | | | | | | | | | | |
| | 18~22 | 15~18 | 12~15 | | | 900141* | 176 | | | | | | | | | | | | | | | | | | | | |
| | 15~18 | 12~15 | 10~12 | | | 571104 | 155 | | | | | | | | | | | | | | | | | | | | |
| | 12~15 | 10~12 | 8~10 | | | 371241 | 116 | | | | | | | | | | | | | | | | | | | | |
| | 18~22 | 15~18 | 12~15 | | | 371291 | 115 | | | | | | | | | | | | | | | | | | | | |
| | 15~18 | 12~15 | 10~12 | | | 371201 | 114 | | | | | | | | | | | | | | | | | | | | |
| | 12~15 | 10~12 | 8~10 | | | 571437 | 140 | | | | | | | | | | | | | | | | | | | | |
| | 15~18 | 12~15 | 10~12 | | | 571403 | 139 | | | 571463 | 141 | | | | | | | | 576463 | 141 | | | | | | | |
| | 12~15 | 10~12 | 8~10 | | | | | | | 371164 | 95 | | | | | | | | 376164 | 95 | | | | | | | |
|  | 175 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 18~22 | 15~18 | | | | 900447* | 177 | | | | | | | | | | | | | | | | | | | | |
| | 15~18 | 12~15 | 10~12 | | | 900440* | 177 | | | | | | | | | | | | | | | | | | | | |
| | 12~15 | 10~12 | 8~10 | | | 571154 | 156 | | | | | | | | | | | | | | | | | | | | |
| | 10~12 | 8~10 | | | | 571603 | 146 | | | | | | | | | | | | | | | | | | | | |
| | 12~15 | 10~12 | 8~10 | | | 371241 | 116 | | | | | | | | | | | | | | | | | | | | |
| | 10~12 | 8~10 | | | | 371291 | 115 | | | | | | | | | | | | | | | | | | | | |
| | 12~15 | 10~12 | 8~10 | | | 371201 | 114 | | | | | | | | | | | | | | | | | | | | |
| | 10~12 | 8~10 | | | | 571737 | 143 | | | | | | | | | | | | | | | | | | | | |
| | 12~15 | 10~12 | 8~10 | | | 571703 | 142 | | | 571723 | 144 | | | 571763 | 145 | | | | 576703 | 142 | | | | | | | |
| 10~12 | 8~10 | | | | | | | | 371364 | 108 | | | | | | | | 376364 | 108 | | | | | | | | |

|  | | Vc | | M | | | | | | | | MF | | | | G | |
|---|------|--------|-----|----------|----------|--------|----------|--------|----------|----------|----------|----------|----------|----------|----------|---|--|
| | | ≤2xd | 215 | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | ISO 2 6H | ISO 3 6G | ISO 1 4H | ISO 2 6H | ISO 3 6G | ISO 1 4H | ISO 2 6H | | |
|  | ≤2xd | | | | | | | | | | | | | | | | |
| | 215 | 914445 | 216 | 914445 | 216 | 914445 | 216 | 914445 | 216 | 914445 | 216 | 914445 | 216 | 914445 | 216 | | |
| | 215 | 914440 | 215 | 914440 | 215 | 914440 | 215 | 914440 | 215 | 914440 | 215 | 914440 | 215 | 914440 | 215 | | |

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|---|----------|---------|----------|-----|----------|---------|-----------|----------|------------|------------|------------|------------|------------|-----------|-----|--|----|--|----|--|-----------|--|------------|
| | DIN 357 | DIN 374 | | | DIN 371 | DIN 376 | DIN 40435 | DIN 5156 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 40432 | | | | | | | | | |
| | ISO 2 6H | | ISO 2 6H | | ISO 3 6G | | ISO 1 4H | | 6H mod | | 2B | | 3B | | 2B | | 3B | | 2B | | DIN 40430 | | ANSI B 1.1 |
| | | | 374241 | 126 | | | | | | | | | | | | | | | | | | | |
| | | | 374201 | 126 | | | | | 980201 | 130 | | | | | | | | | | | | | |
| | | | 574437 | 148 | | | | | | | | | | | | | | | | | | | |
| | | | 574403 | 147 | | | | | 580403 | 149 | 520403 | 150 | | 530403 | 151 | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 374241 | 126 | | | | | | | | | | | | | | | | | | | |
| | | | 374201 | 126 | | | | | 980201 | 130 | | | | | | | | | | | | | |
| | | | 574737 | 148 | | | | | | | | | | | | | | | | | | | |
| | | | 574703 | 147 | | | | | 580703 | 149 | 520703 | 150 | | 530703 | 151 | | | | | | | | |
| | | | 374343 | 124 | 374364 | 125 | | | | | | | | | | | | | | | | | |

Oberflächenbehandlungen/Beschichtungen
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Anwendungstabelle


Application table

Tableau d'application

Tabella di applicazione

MAT 3.4/4.3

|  | | M | | | | | | | | | | | | | | | | | | | |
|---|--|--------|--------|---------|----------|----------|----------|--------|----------|--------|----------|----------|-----|----------|-----|--|--|--------|--------|--------|-----|
| | | Vc | | DIN 352 | | | | | DIN 371 | | | | | DIN 376 | | | | | | | |
| | | ≤1,5xd | ≤2,5xd | ≤3xd | ISO 2 6H | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | | | | | | |
|  | 175 | | | | | | | | | | | | | | | | | | | | |
| | 22~26 | 22~26 | 18~22 | | | 900140* | 176 | | | | | | | | | | | | | | |
| | 22~26 | 22~26 | 18~22 | | | 900141* | 176 | | | | | | | | | | | | | | |
| | 22~26 | 22~26 | 18~22 | | | 571437 | 140 | | | | | | | | | | | | | | |
| | 22~26 | 22~26 | 18~22 | | | 571143 | 152 | | | | | | | | | | | | | | |
| | 18~22 | 18~22 | 15~18 | | | 571403 | 139 | | | 571463 | 141 | | | | | | | | 576463 | 141 | |
| | 15~18 | 15~18 | 12~15 | | | 371143 | 93 | | | 371164 | 95 | | | | | | | | 376164 | 95 | |
| | 12~15 | 12~15 | 10~12 | 970100 | 66 | | | | | | | | | | | | | | | | |
| | 12~15 | 12~15 | 10~12 | | | 371100 | 70 | 371108 | 72 | | | | | | | | | | | | |
| | 12~15 | 12~15 | 10~12 | | | 371151 | 75 | | | 371106 | 73 | 371170 | 74 | | | | | | | | |
| | 12~15 | 12~15 | 10~12 | | | 371200 | 76 | | | | | | | | | | | | | | |
| | 12~15 | 12~15 | 10~12 | | | 371700 | 77 | | | | | | | | | | | | | | |
| |  | 175 | | | | | | | | | | | | | | | | | | | |
| | | 18~22 | 18~22 | 15~18 | | | 900410* | 177 | | | | | | | | | | | | | |
| | | 18~22 | 18~22 | 15~18 | | | 900447* | 177 | | | | | | | | | | | | | |
| 18~22 | | 18~22 | 15~18 | | | 900440* | 177 | | | | | | | | | | | | | | |
| 18~22 | | 18~22 | 15~18 | | | 571347 | 154 | | | | | | | | | | | | | | |
| 18~22 | | 18~22 | 15~18 | | | 571737 | 143 | | | | | | | | | | | | | | |
| 18~22 | | 18~22 | 15~18 | | | 571343 | 153 | | | | | | | | | | | | | | |
| 18~22 | | 18~22 | 15~18 | | | 571703 | 142 | | | 571723 | 144 | 571763 | 145 | | | | | 576723 | 144 | 576763 | 145 |
| 18~22 | | 18~22 | 15~18 | | | 571603 | 146 | | | | | | | | | | | | | | |
| 15~18 | | 15~18 | 12~15 | | | 371343 | 106 | | | 371364 | 108 | | | | | | | | 376364 | 108 | |
| 12~15 | | 12~15 | 10~12 | | | 371305 | 109 | | | | | | | | | | | | | | |
| 10~12 | | 10~12 | 8~10 | | | 371300 | 79 | 371308 | 82 | 371320 | 80 | 371306 | 83 | 376370 | 84 | | | | | | |
| 10~12 | | 10~12 | 8~10 | 970150 | 66 | | | | | | | | | | | | | | | | |
| 10~12 | | 10~12 | 8~10 | | | 371150 | 78 | | | | | | | | | | | | | | |
| 10~12 | | 10~12 | 8~10 | | | 371200 | 76 | | | | | | | | | | | | | | |
| 10~12 | 10~12 | 8~10 | | | 371700 | 77 | | | | | | | | | | | | | | | |
|  | 32~40 | 32~40 | 26~32 | | | 914851 | 211 | | | | | | | | | | | | | | |
| | 30~40 | 30~40 | 26~32 | | | 371754 | 196 | | | | | | | | | | | | | | |
| | 30~40 | 26~32 | 20~24 | | | 371604 | 198 | | | | | | | | | | | | | | |
| | 30~40 | 26~32 | 20~24 | | | 371504 | 195 | | | 371204 | 197 | 371564 | 199 | 371574 | 200 | | | | | | |
| | 26~32 | 26~32 | 22~26 | | | 371791 | 206 | | | | | | | | | | | | | | |
| | 22~26 | 22~26 | 18~22 | | | 371891 | 205 | | | | | | | | | | | | | | |

 = **IKZ** Mit Innenkühlung · With internal coolant · Arrosage centralisé · Lubrificazione interna

* =  Nur für Synchronbearbeitung · Only for rigid tapping · Uniquement pour le taraudage rigide · Solo per maschiatura rigida

Die vorgeschlagenen Werkzeuge sind in der Regel für den angegebenen Bearbeitungsfall geeignet. Aufgrund der Komplexität der Bearbeitungsparameter obliegt es jedoch dem Anwender, die Eignung des Werkzeugs im konkreten Bearbeitungsfall vor Ort zu überprüfen.

As a rule, the suggested tools are suitable for the shown application. Due to the complexity of process parameters, the user is in charge to check the suitability in the concrete case by himself.

Les outils proposés sont en principe appropriés pour l'usage indiqué. En vertu de la complexité des paramètres d'usinage il obtient à l'utilisateur de vérifier l'aptitude de l'outil dans le cas d'usinage concret sur place.

Gli utensili proposti sono normalmente adatti al caso di lavorazione richiesto. A causa delle complessità delle situazioni di lavoro e' comunque compito dell'utente utilizzare gli utensili secondo il tipo di applicazione specifica.

| M | | MF | | | MJ | | EG-M | G | UNC | UNJC | UNF | UNJF | UN-8 | PG | NPT | | | |
|--------|----------|---------|----------|-----|----------|---------|-----------|----------|------------|------------|------------|------------|------------|-----------|-----------|------------|--------|-----|
| | DIN 357 | DIN 374 | | | DIN 371 | DIN 376 | DIN 40435 | DIN 5156 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 40432 | | | | |
| | ISO 2 6H | | ISO 2 6H | | ISO 3 6G | | ISO 1 4H | 6H mod | | 2B | 3B | 2B | 3B | 2B | DIN 40430 | ANSI B 1.1 | | |
| | | | 574437 | 148 | | | | | | | | | | | | | | |
| | | | 574403 | 147 | | | | 580403 | 149 | 520403 | 150 | | 530403 | 151 | | | | |
| 957100 | 86 | | 374100 | 117 | 374106 | 118 | | 980100 | 127 | 920100 | 131 | | 930100 | 135 | | | | |
| | | | | | | | | | | | | | | | | | | |
| | | | 374200 | 119 | | | | 980200 | 127 | | | | | | 910200 | 138 | | |
| | 357000 | 85 | | | | | | | | | | | | | | 901200 | 138 | |
| | | | | | | | | | | | | | | | | | | |
| | | | 574737 | 148 | | | | | | | | | | | | | | |
| | | | 574703 | 147 | | | | 580703 | 149 | 520703 | 150 | | 530703 | 151 | | | | |
| | | | 374343 | 124 | 374364 | 125 | | | | | | | | | | | | |
| 957300 | 87 | | 374300 | 120 | 374306 | 121 | | 980300 | 128 | 920300 | 132 | | 930300 | 135 | | | | |
| | | | | | | | | | | 921300 | 132 | | | | | | | |
| 957150 | 86 | | 374150 | 120 | | | | | | | | | | | | | | |
| | | | 374200 | 119 | | | | 980200 | 127 | | | | | | 910200 | 138 | 901200 | 138 |
| | 357000 | 85 | | | | | | | | | | | | | | | | |
| | | | 374754 | 202 | | | | | | | | | | | | | | |
| | | | 374604 | 203 | | | | | | | | | | | | | | |
| 957504 | 201 | | 374504 | 202 | | | | 980504 | 203 | 920504 | 204 | | 930504 | 204 | | | | |
| | | | 374891 | 209 | | | | 980891 | 210 | | | | | | | | | |



Oberflächenbehandlungen/Beschichtungen
Surface treatments/Coatings
Traitements de surface/Revêtements
Trattamenti superficiali/Rivestimenti

Eignung der Werkzeuge in der Reihenfolge von OBEN nach UNTEN.

Qualification of the tools in order TOP DOWN.

Sélection des outils : l'outils en première position est le plus approprié.

Utensili consigliati in ordine di preferenza, il primo e' il piu' adatto.



Anwendungstabelle



Application table



Tableau d'application

Tabella di applicazione


4.1/4.2/7.1

|  | |  | | M | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|--|----------|----------|-------------|----|------------|----|------------|----------|------------|----------|-------------|----------|------------|----|------------|----|------------|--|-----------|--|--|--|
| | | | | DIN 352 | | | | DIN 371 | | | | | | | | DIN 376 | | | | | | | | | |
| | | | | ISO 2 6H | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | | | | | | |
| ≤1,5xd | | ≤2,5xd | | ≤3xd | | | | | | | | | | | | | | | | | | | | | |
| 175 | | | | | | 900140* 176 | | | | | | | | 900140* 176 | | | | | | | | | | | |
| 60~70 | | 50~60 | | 40~50 | | 900141* 176 | | | | | | | | 900141* 176 | | | | | | | | | | | |
| 50~60 | | 40~50 | | 32~40 | | 571437 140 | | | | | | | | 576437 140 | | | | | | | | | | | |
| 50~60 | | 40~50 | | 32~40 | | 571143 152 | | | | | | | | 576143 152 | | | | | | | | | | | |
| 50~60 | | 40~50 | | 32~40 | | 571403 139 | | | | 571463 141 | | | | 576403 139 | | | | 576463 141 | | | | | | | |
| 40~50 | | 32~40 | | 26~32 | | 371143 93 | | | | 371164 95 | | | | 376143 93 | | | | 376164 95 | | | | | | | |
| 32~40 | | 26~32 | | 22~26 | | 371140 112 | | | | | | | | 376400 113 | | | | | | | | | | | |
| 32~40 | | 26~32 | | 22~26 | | 371105 96 | | | | | | | | 376105 96 | | | | | | | | | | | |
| 26~32 | | 22~26 | | 18~22 | | 970100 66 | | 371100 70 | | 371108 72 | | | | 376100 70 | | 376108 72 | | | | 376106 73 | | 376170 74 | | | |
| 26~32 | | 22~26 | | 18~22 | | | | | | | | | | 376100 70 | | | | | | | | | | | |
| 26~32 | | 22~26 | | 18~22 | | | | 371151 75 | | | | | | 376151 75 | | | | | | | | | | | |
| 22~26 | | | | | | | | 371200 76 | | | | | | 376200 76 | | | | | | | | | | | |
| 22~26 | | | | | | | | 371700 77 | | | | | | 376700 77 | | | | | | | | | | | |
| 175 | | | | | | 900447* 177 | | | | | | | | 900447* 177 | | | | | | | | | | | |
| 50~60 | | 40~50 | | 32~40 | | 900410* 177 | | | | | | | | 900440* 177 | | | | | | | | | | | |
| 50~60 | | 40~50 | | 32~40 | | 571347 154 | | | | | | | | 576347 154 | | | | | | | | | | | |
| 50~60 | | 40~50 | | 32~40 | | 571737 143 | | | | | | | | 576737 143 | | | | | | | | | | | |
| 40~50 | | 32~40 | | 26~32 | | 571343 153 | | | | | | | | 576343 153 | | | | | | | | | | | |
| 40~50 | | 32~40 | | 26~32 | | 571703 142 | | 571723 144 | | 571763 145 | | | | 576703 142 | | 576723 144 | | 576763 145 | | | | | | | |
| 32~40 | | 26~32 | | 22~26 | | 371343 106 | | | | 371364 108 | | | | 376343 106 | | | | 376364 108 | | | | | | | |
| 32~40 | | 26~32 | | 22~26 | | 571603 146 | | | | | | | | 576603 146 | | | | | | | | | | | |
| 26~32 | | 22~26 | | 18~22 | | 371400 113 | | | | | | | | 376400 113 | | | | | | | | | | | |
| 26~32 | | 22~26 | | 18~22 | | 371305 109 | | | | | | | | 376305 109 | | | | | | | | | | | |
| 22~26 | | 18~22 | | | | 970300 67 | | 371300 79 | | 371308 82 | | 371320 80 | | 376300 79 | | 376308 82 | | 376320 80 | | 376306 83 | | 376370 84 | | | |
| 22~26 | | 18~22 | | | | | | | | | | | | 376320 80 | | | | | | | | | | | |
| 22~26 | | | | | | 970150 66 | | 371150 78 | | | | | | 376150 78 | | | | | | | | | | | |
| 22~26 | | | | | | | | 371200 76 | | | | | | 376200 76 | | | | | | | | | | | |
| 22~26 | | | | | | | | 371700 77 | | | | | | 376700 77 | | | | | | | | | | | |
| 70~80 | | 60~70 | | 50~60 | | 914851 211 | | | | | | | | 914851 211 | | | | | | | | | | | |
| 60~70 | | 50~60 | | 40~50 | | 371791 206 | | | | | | | | 376791 206 | | | | | | | | | | | |
| 50~60 | | 40~50 | | 32~40 | | 371891 205 | | | | 371792 208 | | | | 376891 205 | | | | 376892 207 | | | | | | | |
| 30~40 | | 30~40 | | 26~32 | | 371754 196 | | | | 371892 207 | | | | 376754 196 | | | | | | | | | | | |
| 30~40 | | 26~32 | | 20~24 | | 371604 198 | | | | | | | | 376604 198 | | | | | | | | | | | |
| 30~40 | | 26~32 | | 20~24 | | 371504 195 | | 371204 197 | | 371564 199 | | 371574 200 | | 376504 195 | | 376204 197 | | 376564 199 | | 376574 200 | | | | | |

|  | |  | | M | | | | | | | | MF | | | | G | |
|---|--|---|--|------------|----------|------------|----------|------------|----------|------------|--|------------|--|------------|--|------------|--|
| | | | | ISO 1 4H | | ISO 2 6H | | LH | | ISO 3 6G | | 7G | | ISO 2 6H | | ISO 3 6G | |
| | | | | ISO 1 4H | ISO 2 6H | LH | ISO 3 6G | 7G | ISO 2 6H | ISO 3 6G | | | | | | | |
| ≤2xd | | | | | | | | | | | | | | | | | |
| 215 | | | | 914445 216 | | 914445 216 | | 914445 216 | | 914445 216 | | 914445 216 | | 914445 216 | | 914445 216 | |
| | | | | 914440 215 | | 914440 215 | | 914440 215 | | 914440 215 | | 914440 215 | | 914440 215 | | 914440 215 | |

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| M | | MF | | | MJ | | EG-M | G | UNC | UNJC | UNF | UNJF | UN-8 | PG | NPT |
|--------|----------|---------|----------|-----|----------|---------|-----------|----------|------------|------------|------------|------------|------------|-----------|-----|
| | DIN 357 | DIN 374 | | | DIN 371 | DIN 376 | DIN 40435 | DIN 5156 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 40432 | |
| | ISO 2 6H | | ISO 2 6H | | ISO 3 6G | | ISO 1 4H | 6H mod | | 2B | 3B | 2B | 3B | 2B | 3B |
| | | | 574437 | 148 | | | | | | | | | | | |
| | | | 574403 | 147 | | | | 580403 | 149 | 520403 | 150 | | 530403 | 151 | |
| 957100 | 86 | | 374100 | 117 | 374106 | 118 | | 980100 | 127 | 920100 | 131 | | 930100 | 135 | |
| | 357151 | 85 | | | | | | | | 921100 | 131 | | | | |
| | | | 374200 | 119 | | | | 980200 | 127 | | | | | 910200 | 138 |
| | 357000 | 85 | | | | | | | | | | | | 901200 | 138 |
| | | | | | | | | | | | | | | | |
| | | | 574737 | 148 | | | | | | | | | | | |
| | | | 574703 | 147 | | | | 580703 | 149 | 520703 | 150 | | 530703 | 151 | |
| | | | 374343 | 124 | 374364 | 125 | | | | | | | | | |
| 957300 | 87 | | 374300 | 120 | 374306 | 121 | | 980300 | 128 | 920300 | 132 | | 930300 | 135 | |
| | | | | | | | | | | 921300 | 132 | | | | |
| 957150 | 86 | | 374150 | 120 | | | | 980150 | 128 | | | | | | |
| | | | 374200 | 119 | | | | 980200 | 127 | | | | | 910200 | 138 |
| | 357000 | 85 | | | | | | | | | | | | 901200 | 138 |
| | | | | | | | | | | | | | | | |
| | | | 374891 | 209 | | | | 980891 | 210 | | | | | | |
| | | | 374754 | 202 | | | | | | | | | | | |
| | | | 374604 | 203 | | | | | | | | | | | |
| 957504 | 201 | | 374504 | 202 | | | | 980504 | 203 | 920504 | 204 | | 930504 | 204 | |



Oberflächenbehandlungen/Beschichtungen
Surface treatments/Coatings
Traitements de surface/Revêtements
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Eignung der Werkzeuge in der Reihenfolge von OBEN nach UNTEN.

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Utensili consigliati in ordine di preferenza, il primo e' il piu' adatto.

Anwendungstabelle






Application table



Tableau d'application

Tabella di applicazione

MAT

5.1-5.2



|  | | M | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|--------|------|----------|----------|----------|---------|--------------------|----------|----|----------|----------|---------|--------------------|----------|----|----------|----------|---------|--------------------|----------|----|------------|--|
| | | V _c | | | | | | DIN 352 | | | | | | DIN 371 | | | | | | DIN 376 | | | | | |
| | | ≤1,5xd | ≤2,5xd | ≤3xd | ISO 2 6H | ISO 1 4H | ISO 2 6H | LH | E _{1.5-2} | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | E _{1.5-2} | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | E _{1.5-2} | ISO 3 6G | 7G | | |
|  |  175 | | | | | | | | | | | | | | | | | | | | | | | | |
| | 6~8 5~6 5~6 | | | | | 900140* | 176 | | | | | | | | | | | | | | 900140* | 176 | | | |
| | 6~8 5~6 5~6 | | | | | 900141* | 176 | | | | | | | | | | | | | | 900141* | 176 | | | |
| | 5~6 3~5 3~5 | | | | | 571103 | 166 | | | | | | | | | | | | | | 576103 | 166 | | | |
| | 3~5 2~4 2~4 | | | | | 571143 | 152 | | | | | | | | | | | | | | 576143 | 152 | | | |
| | 3~5 2~4 2~4 | | | | | 371143 | 93 | | | | | | | | | | | | | | 376143 | 93 | | 376164 95 | |
| | 3~5 2~4 2~4 | | | | | 371103 | 91 | | | | | | | | | | | | | | 376103 | 91 | | 376163 94 | |
| | 3~5 2~4 2~4 | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3~5 2~4 2~4 | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3~5 2~4 2~4 | | | | | | | | | | | | | | | | | | | | | | | | |
| | 3~5 2~4 2~4 | | | | | | | | | | | | | | | | | | | | | | | | |
| |  |  175 | | | | | | | | | | | | | | | | | | | | | | | |
| 5~6 5~6 | | | | | | 900447* | 177 | | | | | | | | | | | | | | 900447* | 177 | | | |
| 5~6 5~6 | | | | | | 900440* | 177 | | | | | | | | | | | | | | 900440* | 177 | | | |
| 5~6 5~6 3~5 | | | | | | 571153 | 167 | | | | | | | | | | | | | | 576153 | 167 | | | |
| 5~6 5~6 | | | | | | 571347* | 154 | | | | | | | | | | | | | | 576347* | 154 | | | |
| 3~5 3~5 | | | | | | 571343* | 153 | | | | | | | | | | | | | | 576343* | 153 | | | |
| 3~5 3~5 | | | | | | 371343 | 106 | | | | | | | | | | | | | | 376343 | 106 | | 376364 108 | |
| 2~4 2~4 | | | | | | 371153 | 98 | | | | | | | | | | | | | | 376153 | 98 | | | |
| 2~4 2~4 | | | | | | 371303 | 100 | | | | | | | | | | | | | | 376303 | 100 | | 376363 107 | |
| 2~4 2~4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2~4 2~4 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2~4 2~4 | | | | | | | | | | | | | | | | | | | | | | | | | |



 = **IKZ** Mit Innenkühlung · With internal coolant · Arrosage centralisé · Lubrificazione interna

* =  Nur für Synchronbearbeitung · Only for rigid tapping · Uniquement pour le taraudage rigide · Solo per maschiatura rigida

MAT

5.3/8.1

|  | | M | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------|----------------|--------|------|----------|----------|----------|---------|--------------------|----------|----|----------|----------|---------|--------------------|----------|----|----------|----------|---------|--------------------|----------|----|--|--|
| | | V _c | | | | | | DIN 352 | | | | | | DIN 371 | | | | | | DIN 376 | | | | | |
| | | ≤1,5xd | ≤2,5xd | ≤3xd | ISO 2 6H | ISO 1 4H | ISO 2 6H | LH | E _{1.5-2} | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | E _{1.5-2} | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | E _{1.5-2} | ISO 3 6G | 7G | | |
|  | 5~6 3~5 3~5 | | | | | | | | | | | | | | | | | | | | | | | | |
| | 5~6 3~5 3~5 | | | | | | | | | | | | | | | | | | | | 576103 | 166 | | | |
| | 5~6 3~5 | | | | | | | | | | | | | | | | | | | | 576104 | 155 | | | |
| | 5~6 3~5 | | | | | | | | | | | | | | | | | | | | 576153 | 167 | | | |
| 5~6 3~5 | | | | | | | | | | | | | | | | | | | | 576154 | 156 | | | | |


 = **IKZ** Mit Innenkühlung · With internal coolant · Arrosage centralisé · Lubrificazione interna

* =  Nur für Synchronbearbeitung · Only for rigid tapping · Uniquement pour le taraudage rigide · Solo per maschiatura rigida





Anwendungstabelle


Application table

Tableau d'application

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MAT 6.1 / 6.2

| | | M | | | | | | | | | | | | | | | | | | | | |
|---|--|---|------|----------|----------|---------|---------|-------------------|-----|----------|--------|----------|----------|-----|-------------------|---------|----------|----|--|--------|-----|--|
| | | DIN 352 | | | | | | DIN 371 | | | | | | | | DIN 376 | | | | | | |
| Vc | | ISO 2 6H | | ISO 1 4H | ISO 2 6H | | LH | E ₁₅₋₂ | | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | E ₁₅₋₂ | | ISO 3 6G | 7G | | | | |
| ≤1,5xd | | ≤2,5xd | | ≤3xd | | | | | | | | | | | | | | | | | | |
|  |  | 175 | | | | 900140* | 176 | | | | | | | | | | | | | | | |
| | | | | | | 900141* | 176 | | | | | | | | | | | | | | | |
| | | 8~10 | 8~10 | 6~8 | | | 571437 | 140 | | | | | | | | | | | | | | |
| | | 8~10 | 6~8 | 6~8 | | | 571143 | 152 | | | | | | | | | | | | | | |
| | | 8~10 | 6~8 | 6~8 | | | 571403 | 139 | | | 571463 | 141 | | | | | | | | 576463 | 141 | |
| | | 6~8 | 5~6 | 5~6 | | | 371143 | 93 | | | 371164 | 95 | | | | | | | | 376164 | 95 | |
| | | 5~6 | 4~5 | 4~5 | | | 371193 | 92 | | | | | | | | | | | | 376193 | 92 | |
| | | 4~5 | 2~4 | 2~4 | | 371801 | 90 | 371103 | 91 | | | | | | | | | | | | | |
| | | 4~5 | 2~4 | 2~4 | | | | | | | 371163 | 94 | | | | | | | | | | |
| | | 4~5 | 2~4 | 2~4 | | | | 371105 | 96 | | | | | | | | | | | | | |
| | | 3~5 | | | | | | 371203 | 97 | | | | | | | | | | | | | |
| |  |  | 175 | | | | 900447* | 177 | | | | | | | | | | | | | | |
| | | | | | | | 900440* | 177 | | | | | | | | | | | | | | |
| | | | 6~8 | 6~8 | 5~6 | | | 571347 | 154 | | | | | | | | | | | | | |
| | | | 6~8 | 6~8 | 5~6 | | | 571737 | 143 | | | | | | | | | | | | | |
| | | 6~8 | 5~6 | 5~6 | | | 571603 | 146 | | | | | | | | | | | | | | |
| | | 6~8 | 5~6 | 5~6 | | | 571343 | 153 | | | | | | | | | | | | | | |
| | | 6~8 | 5~6 | 5~6 | | | 571703 | 142 | | 571723 | 144 | 571763 | 145 | | | | | | | 576703 | 142 | |
| | | 5~6 | 4~5 | 4~5 | | | 371343 | 106 | | | 371364 | 108 | | | | | | | | 376343 | 106 | |
| | | 4~5 | 4~5 | 2~4 | | | 371393 | 105 | | | | | | | | | | | | 376393 | 105 | |
| | | 2~4 | 2~4 | 2~3 | | 970053 | 67 | | | | | | | | | | | | | | | |
| | | 2~4 | 2~4 | | | | | 371053 | 103 | | | | | | | | | | | | | |
| | | 2~4 | 2~4 | | | | | 371313 | 101 | | | | | | | | | | | | | |
| | | 2~4 | 2~4 | | | 371803 | 99 | 371303 | 100 | | 371323 | 102 | 371363 | 107 | | | | | | 376303 | 100 | |
| | | 2~4 | 2~3 | | | | | 371305 | 109 | | | | | | | | | | | | | |
| | | 2~4 | | | | | | 371153 | 98 | | | | | | | | | | | | | |
| | 2~4 | | | | | | 371203 | 97 | | | | | | | | | | | | | | |

 = **IKZ** Mit Innenkühlung · With internal coolant · Arrosage centralisé · Lubrificazione interna

* =  Nur für Synchronbearbeitung · Only for rigid tapping · Uniquement pour le taraudage rigide · Solo per maschiatura rigida

Die vorgeschlagenen Werkzeuge sind in der Regel für den angegebenen Bearbeitungsfall geeignet. Aufgrund der Komplexität der Bearbeitungsparameter obliegt es jedoch dem Anwender, die Eignung des Werkzeugs im konkreten Bearbeitungsfall vor Ort zu überprüfen.

As a rule, the suggested tools are suitable for the shown application. Due to the complexity of process parameters, the user is in charge to check the suitability in the concrete case by himself.

Les outils proposés sont en principe appropriés pour l'usage indiqué. En vertu de la complexité des paramètres d'usinage il obtient à l'utilisateur de vérifier l'aptitude de l'outil dans le cas d'usinage concret sur place.

Gli utensili proposti sono normalmente adatti al caso di lavorazione richiesto. A causa delle complessità delle situazioni di lavoro e' comunque compito dell'utente utilizzare gli utensili secondo il tipo di applicazione specifica.

| M | | MF | | | MJ | | EG-M | | G | UNC | UNJC | UNF | UNJF | UN-8 | PG | NPT |
|------------|----------|------------|------------|------------|----------|----------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|------------|
| | DIN 357 | DIN 374 | | | DIN 371 | DIN 376 | DIN 40435 | DIN 5156 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 40432 | |
| | ISO 2 6H | ISO 2 6H | ISO 3 6G | | ISO 1 4H | ISO 1 4H | 6H mod | | | 2B | 3B | 2B | 3B | 2B | DIN 40430 | ANSI B 1.1 |
| | | 574437 148 | | | | | | | | | | | | | | |
| | | 574403 147 | | | | | | 580403 149 | 520403 150 | | | 530403 151 | | | | |
| | | | 374103 122 | 374163 123 | | | 381103 110 | 980103 129 | 920103 133 | | | 930103 136 | | | | |
| | | | | | | | | | 921103 133 | | | | | | | |
| | | 574737 148 | | | | | | | | | | | | | | |
| | | 574703 147 | | | | | | 580703 149 | 520703 150 | | | 530703 151 | | | | |
| | | 374343 124 | 374364 125 | | | | | | | | | | | | | |
| 957053 104 | | 374303 124 | 374363 125 | | | | 381303 111 | 980303 129 | 920303 134 | | | 930303 136 | | 922303 137 | | |
| | | | | | | | | | 921303 134 | | | | | | | |

Oberflächenbehandlungen/Beschichtungen
 Surface treatments/Coatings
 Traitements de surface/Revêtements
 Trattamenti superficiali/Rivestimenti

OX/Ni-OX
TiN
TiCN
TiAlN
CrN
Hardlube
STiN

Eignung der Werkzeuge in der Reihenfolge von OBEN nach UNTEN.

Qualification of the tools in order TOP DOWN.

Sélection des outils : l'outils en première position est le plus approprié.

Utensili consigliati in ordine di preferenza, il primo e' il piu' adatto.

Anwendungstabelle

Application table

Tableau d'application

Tabella di applicazione

MAT 6.3

| | | M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|--|----------------|--------|------|----------|----------|----------|----|--------------------|----------|--------|----------|----------|---------|--------------------|----------|----|--|--|--|--|--|---------|--|--|--|--|--|--|--|--|--|--------|-----|
| | | V _c | | | DIN 352 | | | | | | | | | DIN 371 | | | | | | | | | DIN 376 | | | | | | | | | | | |
| | | ≤1,5xd | ≤2,5xd | ≤3xd | ISO 2 6H | ISO 1 4H | ISO 2 6H | LH | E _{1.5-2} | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | E _{1.5-2} | ISO 3 6G | 7G | | | | | | | | | | | | | | | | | |
| | | 6~8 | 5~6 | 3~5 | | | | | | | 571109 | 168 | | | | | | | | | | | | | | | | | | | | | 576109 | 168 |
| | | 5~6 | 3~5 | | | | | | | | 571119 | 169 | | | | | | | | | | | | | | | | | | | | | 576119 | 169 |



= **IKZ** Mit Innenkühlung · With internal coolant · Arrosage centralisé · Lubrificazione interna

* = Nur für Synchronbearbeitung · Only for rigid tapping · Uniquement pour le taraudage rigide · Solo per maschiatura rigida

MAT 8.2

| | | M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|----------------|-----|--------|----------|----------|----------|----|--------------------|----------|----|----------|----------|---------|--------------------|----------|----|--|--|--|--|--|---------|--|--|--|--|--|--|--|--|--|--|
| | | V _c | | | DIN 352 | | | | | | | | | DIN 371 | | | | | | | | | DIN 376 | | | | | | | | | | |
| | | HRC | 1xd | <1,5xd | ISO 2 6H | ISO 1 4H | ISO 2 6H | LH | E _{1.5-2} | ISO 3 6G | 7G | ISO 1 4H | ISO 2 6H | LH | E _{1.5-2} | ISO 3 6G | 7G | | | | | | | | | | | | | | | | |
| | | 42 ~ 53 | 2,5 | 2,5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 50 ~ 54 | 2,5 | 2,5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 55 ~ 59 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 60 ~ 63 | 1,8 | 1,8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

= **IKZ** Mit Innenkühlung · With internal coolant · Arrosage centralisé · Lubrificazione interna

* = Nur für Synchronbearbeitung · Only for rigid tapping · Uniquement pour le taraudage rigide · Solo per maschiatura rigida

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As a rule, the suggested tools are suitable for the shown application. Due to the complexity of process parameters, the user is in charge to check the suitability in the concrete case by himself.

Les outils proposés sont en principe appropriés pour l'usage indiqué. En vertu de la complexité des paramètres d'usinage il obtient à l'utilisateur de vérifier l'aptitude de l'outil dans le cas d'usinage concret sur place.

Gli utensili proposti sono normalmente adatti al caso di lavorazione richiesto. A causa delle complessità delle situazioni di lavoro e' comunque compito dell'utente utilizzare gli utensili secondo il tipo di applicazione specifica.

| M | | MF | | | MJ | | EG-M | G | UNC | UNJC | UNF | UNJF | UN-8 | PG | NPT |
|--|---------|---------|--|--------|---------|---------|-----------|----------|------------|------------|------------|------------|------------|-----------|-----|
| | DIN 357 | DIN 374 | | | DIN 371 | DIN 376 | DIN 40435 | DIN 5156 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 40432 | |
| | | | | | | | | | | | | | | | |
| | | | | 573119 | 170 | | | | | 523119 | 171 | | 533119 | 172 | |
| Oberflächenbehandlungen/Beschichtungen Surface treatments/Coatings Traitements de surface/Revêtements Trattamenti superficiali/Rivestimenti | | | | | | | | | | | | | | | |

Eignung der Werkzeuge in der Reihenfolge von OBEN nach UNTEN.

Qualification of the tools in order TOP DOWN.

Sélection des outils : l'outils en première position est le plus approprié.

Utensili consigliati in ordine di preferenza, il primo e' il piu' adatto.



| M | | MF | | | MJ | | EG-M | G | UNC | UNJC | UNF | UNJF | UN-8 | PG | NPT |
|--|---------|---------|--------|-----|---------|---------|-----------|----------|------------|------------|------------|------------|------------|-----------|-----|
| | DIN 357 | DIN 374 | | | DIN 371 | DIN 376 | DIN 40435 | DIN 5156 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 2184-1 | DIN 40432 | |
| | | | | | | | | | | | | | | | |
| 954100 | 178 | | 954100 | 178 | | | | 954100 | 178 | | | | | | |
| 954200 | 178 | | 954200 | 178 | | | | 954200 | 178 | | | | | | |
| 914100 | 179 | | 914100 | 179 | | | | 914100 | 179 | | | | | | |
| 914200 | 179 | | 914200 | 179 | | | | 914200 | 179 | | | | | | |
| 914100 | 179 | | 914100 | 179 | | | | 914100 | 179 | | | | | | |
| 914200 | 179 | | 914200 | 179 | | | | 914200 | 179 | | | | | | |
| 914100 | 179 | | 914100 | 179 | | | | 914100 | 179 | | | | | | |
| 914200 | 179 | | 914200 | 179 | | | | 914200 | 179 | | | | | | |
| Oberflächenbehandlungen/Beschichtungen Surface treatments/Coatings Traitements de surface/Revêtements Trattamenti superficiali/Rivestimenti | | | | | | | | | | | | | | | |

Eignung der Werkzeuge in der Reihenfolge von OBEN nach UNTEN.

Qualification of the tools in order TOP DOWN.

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Utensili consigliati in ordine di preferenza, il primo e' il piu' adatto.

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M **DIN 352** **HSSE V3** **DIN 13**

| | | | | | | | | |
|---------|--|--------|----------|------------|-------------------------|--------------------------|----------------------|----|
| 970 100 | | Typ N | ISO 2 6H | B 3,5-5 | ≤ 800 N/mm ² | | M2 – M12 | 66 |
| 970 150 | | Typ N | ISO 2 6H | C 2-3 | 15° | ≤ 800 N/mm ² | M3 – M12 | 66 |
| 970 300 | | Typ N | ISO 2 6H | C 2-3 | 40° | ≤ 800 N/mm ² | M2 – M16 | 67 |
| 970 053 | | Typ VA | ISO 2 6H | C 2-3 | 45° | ≤ 1200 N/mm ² | VA-OX M2 – M6 | 67 |

M **DIN 371** **DIN 376** **HSSE V3** **DIN 13**

| | | | | | | | | |
|---------|--|----------|----------|------------|-------------------------|-------------------------|-----------------------|----|
| 371 107 | | Typ WM | ISO 2 6H | B 3,5-5 | ≤ 800 N/mm ² | WM-OX | M1 – M10 | 68 |
| 376 107 | | Typ WM | ISO 2 6H | B 3,5-5 | ≤ 800 N/mm ² | WM-OX | M12 – M36 | 68 |
| 371 307 | | Typ WM | ISO 2 6H | C 2-3 | 40° | ≤ 800 N/mm ² | WM-OX M3 – M10 | 69 |
| 376 307 | | Typ WM | ISO 2 6H | C 2-3 | 40° | ≤ 800 N/mm ² | WM-OX M3 – M36 | 69 |
| 371 100 | | Typ N | ISO 2 6H | B 3,5-5 | ≤ 800 N/mm ² | | M1,4 – M12 | 70 |
| 376 100 | | Typ N | ISO 2 6H | B 3,5-5 | ≤ 800 N/mm ² | | M2 – M52 | 70 |
| 371 190 | | Typ N | ISO 2 6H | B 3,5-5 | ≤ 800 N/mm ² | TiN | M3 – M10 | 71 |
| 376 190 | | Typ N | ISO 2 6H | B 3,5-5 | ≤ 800 N/mm ² | TiN | M3 – M36 | 71 |
| 371 108 | | Typ N LH | ISO 2 6H | B 3,5-5 | ≤ 800 N/mm ² | | M3 – M10 | 72 |
| 376 108 | | Typ N LH | ISO 2 6H | B 3,5-5 | ≤ 800 N/mm ² | | M12 – M20 | 72 |
| 371 106 | | Typ N | ISO 3 6G | B 3,5-5 | ≤ 800 N/mm ² | | M2 – M10 | 73 |
| 376 106 | | Typ N | ISO 3 6G | B 3,5-5 | ≤ 800 N/mm ² | | M12 – M20 | 73 |
| 371 170 | | Typ N | 7G | B 3,5-5 | ≤ 800 N/mm ² | | M3 – M10 | 74 |

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Catalogue no.
Catalogue n°
Nr. di catalogo



| | | | | | | | | | |
|---------|--|-------|----|-------------|------------|----------------------------|----------------------------|--------------|----|
| 376 170 | | Typ N | 7G | B 3,5-5 | | ≤ 800 N/mm ² | M12 – M20 | 74 | |
| 371 151 | | Typ N | RH | ISO 2 6H | D 3,5-5 | LSP 15° | ≤ 800 N/mm ² | M3 – M10 | 75 |
| 376 151 | | Typ N | RH | ISO 2 6H | D 3,5-5 | LSP 15° | ≤ 800 N/mm ² | M12 – M16 | 75 |
| 371 200 | | Typ N | | ISO 2 6H | C 2-3 | | ≤ 800 N/mm ² | M1,4 – M10 | 76 |
| 376 200 | | Typ N | | ISO 2 6H | C 2-3 | | ≤ 800 N/mm ² | M3 – M42 | 76 |
| 371 700 | | Typ N | | ISO 2 6H | A 6-8 | | ≤ 800 N/mm ² | M2 – M10 | 77 |
| 376 700 | | Typ N | | ISO 2 6H | A 6-8 | | ≤ 800 N/mm ² | M3 – M10 | 77 |
| 371 150 | | Typ N | | ISO 2 6H | C 2-3 | 15° | ≤ 800 N/mm ² | M2 – M10 | 78 |
| 376 150 | | Typ N | | ISO 2 6H | C 2-3 | 15° | ≤ 800 N/mm ² | M3 – M36 | 78 |
| 371 300 | | Typ N | | ISO 2 6H | C 2-3 | 40° | ≤ 800 N/mm ² | M2 – M12 | 79 |
| 376 300 | | Typ N | | ISO 2 6H | C 2-3 | 40° | ≤ 800 N/mm ² | M3 – M36 | 79 |
| 371 320 | | Typ N | | ISO 2 6H | E 1,5-2 | 40° | ≤ 800 N/mm ² | M3 – M10 | 80 |
| 376 320 | | Typ N | | ISO 2 6H | E 1,5-2 | 40° | ≤ 800 N/mm ² | M12 – M16 | 80 |
| 371 390 | | Typ N | | ISO 2 6H | C 2-3 | 45° | ≤ 800 N/mm ² | TiN M3 – M10 | 81 |
| 376 390 | | Typ N | | ISO 2 6H | C 2-3 | 45° | ≤ 800 N/mm ² | TiN M3 – M24 | 81 |
| 371 308 | | Typ N | LH | ISO 2 6H | C 2-3 | LSP 40° | ≤ 800 N/mm ² | M3 – M10 | 82 |
| 376 308 | | Typ N | LH | ISO 2 6H | C 2-3 | LSP 40° | ≤ 800 N/mm ² | M12 – M20 | 82 |
| 371 306 | | Typ N | | ISO 3 6G | C 2-3 | 40° | ≤ 800 N/mm ² | M3 – M12 | 83 |
| 376 306 | | Typ N | | ISO 3 6G | C 2-3 | 40° | ≤ 800 N/mm ² | M12 – M20 | 83 |
| 371 370 | | Typ N | | 7G | C 2-3 | 40° | ≤ 800 N/mm ² | M3 – M10 | 84 |
| 376 370 | | Typ N | | 7G | C 2-3 | 40° | ≤ 800 N/mm ² | M12 – M20 | 84 |

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M **DIN 357** **HSSE V3** **DIN 13**

| | | | | | | | | |
|---------|--|-------|----|----------|---------|-------------------------|----------|----|
| 357 000 | | Typ N | RH | ISO 2 6H | | ≤ 800 N/mm ² | M3 – M20 | 85 |
| 357 151 | | Typ N | RH | ISO 2 6H | LSP 15° | ≤ 800 N/mm ² | M3 – M16 | 85 |

M **WEXO** extra lang extra long extra long extra lunghi **HSSE V3** **DIN 13**

| | | | | | | | | | |
|---------|--|-------|--|----------|---------|-------------------------|-------------------------|----------|----|
| 957 100 | | Typ N | | ISO 2 6H | B 3,5-5 | ≤ 800 N/mm ² | M3 – M20 | 86 | |
| 957 150 | | Typ N | | ISO 2 6H | C 2-3 | 15° | ≤ 800 N/mm ² | M3 – M16 | |
| 957 300 | | Typ N | | ISO 2 6H | C 2-3 | 40° | ≤ 800 N/mm ² | M3 – M20 | 87 |

M **DIN 371** **DIN 376** **HSSE V3** **DIN 13**

| | | | | | | | | | |
|---------|--|--------|----|----------|---------|--------------------------|---------|-----------|----|
| 905 100 | | Typ N | SN | ISO 2 6H | B 3,5-5 | ≤ 800 N/mm ² | Ni-OX | M2 – M16 | 88 |
| 905 104 | | Typ N | | ISO 2 6H | B 3,5-5 | ≤ 800 N/mm ² | Ni-OX | M2 – M10 | 89 |
| 371 801 | | Typ VA | | ISO 1 4H | B 3,5-5 | ≤ 1200 N/mm ² | VA-OX | M3 – M8 | 90 |
| 371 103 | | Typ VA | | ISO 2 6H | B 3,5-5 | ≤ 1200 N/mm ² | VA-OX | M2 – M12 | 91 |
| 376 103 | | Typ VA | | ISO 2 6H | B 3,5-5 | ≤ 1200 N/mm ² | VA-OX | M3 – M36 | 91 |
| 371 193 | | Typ VA | | ISO 2 6H | B 3,5-5 | ≤ 1200 N/mm ² | VA-TiN | M3 – M10 | 92 |
| 376 193 | | Typ VA | | ISO 2 6H | B 3,5-5 | ≤ 1200 N/mm ² | VA-TiN | M4 – M30 | 92 |
| 371 143 | | Typ VA | | ISO 2 6H | B 3,5-5 | ≤ 1200 N/mm ² | VA-TiCN | M3 – M10 | 93 |
| 376 143 | | Typ VA | | ISO 2 6H | B 3,5-5 | ≤ 1200 N/mm ² | VA-TiCN | M12 – M36 | 93 |

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Catalogue n°
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




| | | | | | | | | |
|---------|--|-----------|-------------------|----------------|------------------------------------|---------|-----------|-----|
| 371 163 | | Typ VA | ISO 3 6G | B 3,5-5 | ≤ 1200 N/mm ² | VA-OX | M2 – M10 | 94 |
| 376 163 | | Typ VA | ISO 3 6G | B 3,5-5 | ≤ 1200 N/mm ² | VA-OX | M12 – M20 | 94 |
| 371 164 | | Typ VA | ISO 3 6G | B 3,5-5 | ≤ 1200 N/mm ² | VA-TiCN | M2 – M10 | 95 |
| 376 164 | | Typ VA | ISO 3 6G | B 3,5-5 | ≤ 1200 N/mm ² | VA-TiCN | M12 – M20 | 95 |
| 371 105 | | Typ VA | AZ ISO 2 6H | B 3,5-5 | ≤ 1200 N/mm ² | VA-AZ | M2 – M10 | 96 |
| 376 105 | | Typ VA | AZ ISO 2 6H | B 3,5-5 | ≤ 1200 N/mm ² | VA-AZ | M12 – M20 | 96 |
| 371 203 | | Typ VA | ISO 2 6H | C 2-3 | ≤ 1200 N/mm ² | VA-OX | M2 – M10 | 97 |
| 376 203 | | Typ VA | ISO 2 6H | C 2-3 | ≤ 1200 N/mm ² | VA-OX | M12 – M20 | 97 |
| 371 153 | | Typ VA | ISO 2 6H | C 2-3 | 15° ≤ 1200 N/mm ² | VA-OX | M3 – M10 | 98 |
| 376 153 | | Typ VA | ISO 2 6H | C 2-3 | 15° ≤ 1200 N/mm ² | VA-OX | M12 – M36 | 98 |
| 371 803 | | Typ VA | ISO 1 4H | C 2-3 | 40° ≤ 1200 N/mm ² | VA-OX | M3 – M8 | 99 |
| 371 303 | | Typ VA | ISO 2 6H | C 2-3 | 40° ≤ 1200 N/mm ² | VA-OX | M2 – M12 | 100 |
| 376 303 | | Typ VA | ISO 2 6H | C 2-3 | 40° ≤ 1200 N/mm ² | VA-OX | M3 – M36 | 100 |
| 371 313 | | Typ VA | AG ISO 2 6H | C 2-3 | 40° ≤ 1200 N/mm ² | VA-OX | M3 – M10 | 101 |
| 376 313 | | Typ VA | AG ISO 2 6H | C 2-3 | 40° ≤ 1200 N/mm ² | VA-OX | M12 – M20 | 101 |
| 371 323 | | Typ VA | ISO 2 6H | E 1,5-2 | 40° ≤ 1200 N/mm ² | VA-OX | M2 – M10 | 102 |
| 376 323 | | Typ VA | ISO 2 6H | E 1,5-2 | 40° ≤ 1200 N/mm ² | VA-OX | M12 – M16 | 102 |
| 371 053 | | Typ VA | ISO 2 6H | C 2-3 | 45° ≤ 1200 N/mm ² | VA-OX | M2 – M10 | 103 |
| 376 053 | | Typ VA | ISO 2 6H | C 2-3 | 45° ≤ 1200 N/mm ² | VA-OX | M12 – M36 | 103 |

































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



M  extra lang
extra long
extra long
extra lunghi **HSSE V3** **DIN 13**

| | | | | | | | | | |
|---------|---|--------|----------|---|---|--------------------------|-------|-----------|-----|
| 957 053 |  | Typ VA | ISO 2 6H |  |  | ≤ 1200 N/mm ² | VA-OX | M2 – M10 | 104 |
| 957 053 |  | Typ VA | ISO 2 6H |  |  | ≤ 1200 N/mm ² | VA-OX | M12 – M20 | 104 |

M **DIN 371** **DIN 376** **HSSE V3** **DIN 13**

| | | | | | | | | | |
|---------|---|-----------|----------|---|---|--------------------------|---------|-----------|-----|
| 371 393 |  | Typ VA | ISO 2 6H |  |  | ≤ 1200 N/mm ² | VA-TiN | M3 – M10 | 105 |
| 376 393 |  | Typ VA | ISO 2 6H |  |  | ≤ 1200 N/mm ² | VA-TiN | M3 – M20 | 105 |
| 371 343 |  | Typ VA | ISO 2 6H |  |  | ≤ 1200 N/mm ² | VA-TiCN | M3 – M10 | 106 |
| 376 343 |  | Typ VA | ISO 2 6H |  |  | ≤ 1200 N/mm ² | VA-TiCN | M12 – M36 | 106 |
| 371 363 |  | Typ VA | ISO 3 6G |  |  | ≤ 1200 N/mm ² | VA-OX | M2 – M10 | 107 |
| 376 363 |  | Typ VA | ISO 3 6G |  |  | ≤ 1200 N/mm ² | VA-OX | M12 – M30 | 107 |
| 371 364 |  | Typ VA | ISO 3 6G |  |  | ≤ 1200 N/mm ² | VA-TiCN | M2 – M10 | 108 |
| 376 364 |  | Typ VA | ISO 3 6G |  |  | ≤ 1200 N/mm ² | VA-TiCN | M12 – M20 | 108 |
| 371 305 |  | Typ VA AZ | ISO 2 6H |  |  | ≤ 1200 N/mm ² | VA-AZ | M3 – M10 | 109 |
| 376 305 |  | Typ VA AZ | ISO 2 6H |  |  | ≤ 1200 N/mm ² | VA-AZ | M12 – M20 | 109 |

EG-M **DIN 40435** **HSSE V3** **DIN 8140**

| | | | | | | | | | |
|---------|---|--------|--------|---|---|--------------------------|-------|------------------|-----|
| 381 103 |  | Typ VA | 6H mod |  | | ≤ 1200 N/mm ² | VA-OX | EG M2,5 – EG M16 | 110 |
| 381 303 |  | Typ VA | 6H mod |  |  | ≤ 1200 N/mm ² | VA-OX | EG M2,5 – EG M16 | 111 |

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|---------|--|---------|----------|--------------|-----|----------|-----------|-----|
| 371 140 | | Typ ALU | ISO 2 6H | B [3,5-5] | | ALU | M3 – M10 | 112 |
| 376 140 | | Typ ALU | ISO 2 6H | B [3,5-5] | | ALU | M12 – M20 | 112 |
| 371 400 | | Typ ALU | ISO 2 6H | C [2-3] | 45° | ALU | M2 – M10 | 113 |
| 376 400 | | Typ ALU | ISO 2 6H | C [2-3] | 45° | ALU | M12 – M20 | 113 |
| 371 201 | | Typ GG | 6HX | C [2-3] | | GG-Ni-OX | M3 – M10 | 114 |
| 376 201 | | Typ GG | 6HX | C [2-3] | | GG-Ni-OX | M8 – M24 | 114 |
| 371 241 | | Typ GG | 6HX | C [2-3] | | GG-TiCN | M4 – M10 | 116 |
| 376 241 | | Typ GG | 6HX | C [2-3] | | GG-TiCN | M5 – M16 | 116 |



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|---------|--|-------|----------|--------------|-------------------------|-------------------------|-----------------------|-----|
| 374 100 | | Typ N | ISO 2 6H | B [3,5-5] | ≤ 800 N/mm ² | | M3 x 0,35 – M52 x 1,5 | 117 |
| 374 190 | | Typ N | ISO 2 6H | B [3,5-5] | ≤ 800 N/mm ² | TiN | M6 x 0,75 – M16 x 1,5 | 118 |
| 374 106 | | Typ N | ISO 3 6G | B [3,5-5] | ≤ 800 N/mm ² | | M6 x 0,75 – M20 x 1,5 | 118 |
| 374 200 | | Typ N | ISO 2 6H | C [2-3] | ≤ 800 N/mm ² | | M3 x 0,35 – M50 x 1,5 | 119 |
| 374 150 | | Typ N | ISO 2 6H | C [2-3] | 15° | ≤ 800 N/mm ² | M4 x 0,5 – M30 x 2 | 120 |
| 374 300 | | Typ N | ISO 2 6H | C [2-3] | 40° | ≤ 800 N/mm ² | M3 x 0,35 – M30 x 2 | 120 |
| 374 390 | | Typ N | ISO 2 6H | C [2-3] | 45° | ≤ 800 N/mm ² | M8 x 1 – M16 x 1,5 | 121 |
| 374 306 | | Typ N | ISO 3 6G | C [2-3] | 40° | ≤ 800 N/mm ² | M6 x 0,75 – M20 x 1,5 | 121 |

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MF

**DIN
374**

**HSSE
V3**

**DIN
13**

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|---------|--|-----------|-------------|----------------|---------------------------------|----------|--------------------------|-----|
| 374 103 | | Typ VA | ISO 2 6H | B 3,5-5 | ≤ 1200 N/mm ² | VA-OX | M3 x 0,35 – M24 x 1,5 | 122 |
| 374 163 | | Typ VA | ISO 3 6G | B 3,5-5 | ≤ 1200 N/mm ² | VA-OX | M6 x 0,75 – M20 x 1,5 | 123 |
| 374 303 | | Typ VA | ISO 2 6H | C 2-3 | ≤ 1200 N/mm ² | VA-OX | M3 x 0,35 – M30 x 1,5 | 124 |
| 374 343 | | Typ VA | ISO 2 6H | C 2-3 | ≤ 1200 N/mm ² | VA-TiCN | M8 x 1 – M20 x 1,5 | 124 |
| 374 363 | | Typ VA | ISO 3 6G | C 2-3 | ≤ 1200 N/mm ² | VA-OX | M8 x 1 – M20 x 1,5 | 125 |
| 374 364 | | Typ VA | ISO 3 6G | C 2-3 | ≤ 1200 N/mm ² | VA-TiCN | M8 x 1 – M20 x 1,5 | 125 |
| 374 201 | | Typ GG | 6HX | C 2-3 | | GG-Ni-OX | M4 x 0,5 – M24 x 1,5 | 126 |
| 374 241 | | Typ GG | 6HX | C 2-3 | | GG-TiCN | M8 x 1 – M16 x 1,5 | 126 |

G

**DIN
5156**

**HSSE
V3**

**DIN
ISO
228**

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|---------|--|-----------|--|----------------|---------------------------------|----------|----------------------|-----|
| 980 100 | | Typ N | | B 3,5-5 | ≤ 800 N/mm ² | | G 1/8" – G 1 1/2" | 127 |
| 980 200 | | Typ N | | C 2-3 | ≤ 800 N/mm ² | | G 1/8" – G 1 1/2" | 127 |
| 980 150 | | Typ N | | C 2-3 | ≤ 800 N/mm ² | | G 1/8" – G 1" | 128 |
| 980 300 | | Typ N | | C 2-3 | ≤ 800 N/mm ² | | G 1/8" – G 1 1/2" | 128 |
| 980 103 | | Typ VA | | B 3,5-5 | ≤ 1200 N/mm ² | VA-OX | G 1/8" – G 1" | 129 |
| 980 303 | | Typ VA | | C 2-3 | ≤ 1200 N/mm ² | VA-OX | G 1/8" – G 1 1/2" | 129 |
| 980 201 | | Typ GG | | C 2-3 | | GG-Ni-OX | G 1/8" – G 1" | 130 |

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UNC **DIN 2184-1** **HSSE V3** **ANSI B 1.1**

| | | | | | | | | |
|---------|--|--------|----|------------|---------------------------------|-------|----------------------------|-----|
| 920 100 | | Typ N | 2B | B 3,5-5 | ≤ 800 N/mm ² | | UNC #1-64 – UNC 3/8"-16 | 131 |
| 921 100 | | Typ N | 2B | B 3,5-5 | ≤ 800 N/mm ² | | UNC 7/16"-14 – UNC 1"-8 | 131 |
| 920 300 | | Typ N | 2B | C 2-3 | 40° ≤ 800 N/mm ² | | UNC #2-56 – UNC 3/8"-16 | 132 |
| 921 300 | | Typ N | 2B | C 2-3 | 40° ≤ 800 N/mm ² | | UNC 7/16"-14 – UNC 1"-8 | 132 |
| 920 103 | | Typ VA | 2B | B 3,5-5 | ≤ 1200 N/mm ² | VA-OX | UNC #4-40 – UNC 3/8"-16 | 133 |
| 921 103 | | Typ VA | 2B | B 3,5-5 | ≤ 1200 N/mm ² | VA-OX | UNC 1/2"-13 – UNC 1"-8 | 133 |
| 920 303 | | Typ VA | 2B | C 2-3 | 40° ≤ 1200 N/mm ² | VA-OX | UNC #6-32 – UNC 3/8"-16 | 134 |
| 921 303 | | Typ VA | 2B | C 2-3 | 40° ≤ 1200 N/mm ² | VA-OX | UNC 1/2"-13 – UNC 1"-8 | 134 |



UNF **DIN 2184-1** **HSSE V3** **ANSI B 1.1**

| | | | | | | | | |
|---------|--|--------|----|------------|---------------------------------|-------|------------------------------|-----|
| 930 100 | | Typ N | 2B | B 3,5-5 | ≤ 800 N/mm ² | | UNF #0-80 – UNF 1 1/2"-12 | 135 |
| 930 300 | | Typ N | 2B | C 2-3 | 40° ≤ 800 N/mm ² | | UNF #3-56 – UNF 1"-12 | 135 |
| 930 103 | | Typ VA | 2B | B 3,5-5 | ≤ 1200 N/mm ² | VA-OX | UNF #6-40 – UNF 1"-12 | 136 |
| 930 303 | | Typ VA | 2B | C 2-3 | 40° ≤ 1200 N/mm ² | VA-OX | UNF #6-40 – UNF 1"-12 | 136 |

UN-8 **DIN 2184-1** **HSSE V3** **ANSI B 1.1**

| | | | | | | | | |
|---------|--|--------|----|----------|---------------------------------|-------|--------------------------|-----|
| 922 303 | | Typ VA | 2B | C 2-3 | 40° ≤ 1200 N/mm ² | VA-OX | UN 1 1/8"-8 – UN 2"-8 | 137 |
|---------|--|--------|----|----------|---------------------------------|-------|--------------------------|-----|

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Catalogue n°
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PG **DIN 40432** **HSSE V3** **DIN 40430**

| | | | | | | |
|---------|--|-------|------------|-------------------------|--------------|-----|
| 910 200 | | Typ N | C [2-3] | ≤ 800 N/mm ² | Pg 7 – Pg 29 | 138 |
|---------|--|-------|------------|-------------------------|--------------|-----|

NPT **HSSE V3** **ANSI B1.20.1**

| | | | | | | |
|---------|--|-------|------------|-------------------------|-------------------------------|-----|
| 901 200 | | Typ N | C [2-3] | ≤ 800 N/mm ² | NPT 1/16"-27 - NPT 1"-11,5 | 138 |
|---------|--|-------|------------|-------------------------|-------------------------------|-----|

M **DIN 371** **DIN 376** **PS 55** **DIN 13**

| | | | | | | | | | |
|---------|--|---------|-----|--------------|---------------------------------|---------------------------------|-------------------|-----------|-----|
| 571 403 | | Typ UNI | 6HX | B [3,5-5] | ≤ 1300 N/mm ² | GU-B HARDLUBE | M2 – M10 | 139 | |
| 576 403 | | Typ UNI | 6HX | B [3,5-5] | ≤ 1300 N/mm ² | GU-B HARDLUBE | M3 – M30 | 139 | |
| 571 437 | | Typ UNI | IKR | 6HX | B [3,5-5] | ≤ 1300 N/mm ² | GU-B HARDLUBE | M6 – M10 | 140 |
| 576 437 | | Typ UNI | IKR | 6HX | B [3,5-5] | ≤ 1300 N/mm ² | GU-B HARDLUBE | M12 – M24 | 140 |
| 571 463 | | Typ UNI | 6GX | B [3,5-5] | ≤ 1300 N/mm ² | GU-B HARDLUBE | M3 – M10 | 141 | |
| 576 463 | | Typ UNI | 6GX | B [3,5-5] | ≤ 1300 N/mm ² | GU-B HARDLUBE | M12 – M20 | 141 | |
| 571 703 | | Typ UNI | 6HX | C [2-3] | 50° ≤ 1300 N/mm ² | GU-50 HARDLUBE | M2 – M10 | 142 | |
| 576 703 | | Typ UNI | 6HX | C [2-3] | 50° ≤ 1300 N/mm ² | GU-50 HARDLUBE | M3 – M30 | 142 | |
| 571 737 | | Typ UNI | IKA | 6HX | C [2-3] | 50° ≤ 1300 N/mm ² | GU-50 HARDLUBE | M6 – M10 | 143 |
| 576 737 | | Typ UNI | IKA | 6HX | C [2-3] | 50° ≤ 1300 N/mm ² | GU-50 HARDLUBE | M12 – M24 | 143 |
| 571 723 | | Typ UNI | 6HX | E [1,5-2] | 50° ≤ 1300 N/mm ² | GU-50 HARDLUBE | M3 – M10 | 144 | |
| 576 723 | | Typ UNI | 6HX | E [1,5-2] | 50° ≤ 1300 N/mm ² | GU-50 HARDLUBE | M12 – M20 | 144 | |

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|---------|--|------------|-------------|------------|--|-----------------------------|---------------------------|-----------|-----|
| 571 763 | | Typ UNI | 6GX | C [2-3] | | ≤ 1300 N/mm ² | GU-50 HARDLUBE | M3 – M10 | 145 |
| 576 763 | | Typ UNI | 6GX | C [2-3] | | ≤ 1300 N/mm ² | GU-50 HARDLUBE | M12 – M20 | 145 |
| 571 603 | | Typ UNI | ISO 2 6H | C [2-3] | | ≤ 1300 N/mm ² | GU-45 STiN | M3 – M10 | 146 |
| 576 603 | | Typ UNI | ISO 2 6H | C [2-3] | | ≤ 1300 N/mm ² | GU-45 STiN | M12 – M20 | 146 |

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| MF | DIN 374 | PS 55 | DIN 13 |
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|---------|--|------------|------------|--------------|--|-----------------------------|---------------------------|--------------------------|-----|
| 574 403 | | Typ UNI | 6HX | B [3,5-5] | | ≤ 1300 N/mm ² | GU-B HARDLUBE | M3 x 0,35 – M24 x 1,5 | 147 |
| 574 703 | | Typ UNI | 6HX | C [2-3] | | ≤ 1300 N/mm ² | GU-50 HARDLUBE | M3 x 0,35 – M24 x 1,5 | 147 |
| 574 437 | | Typ UNI | IKR 6HX | B [3,5-5] | | ≤ 1300 N/mm ² | GU-B HARDLUBE | M8 x 1 – M20 x 1,5 | 148 |
| 574 737 | | Typ UNI | IKA 6HX | C [2-3] | | ≤ 1300 N/mm ² | GU-50 HARDLUBE | M8 x 1 – M20 x 1,5 | 148 |

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| G | DIN 5156 | PS 55 | DIN ISO 228 |
|---|-------------|-------|-------------------|

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| 580 403 | | Typ UNI | | B [3,5-5] | | ≤ 1300 N/mm ² | GU-B HARDLUBE | G1/8" – G1" | 149 |
| 580 703 | | Typ UNI | | C [2-3] | | ≤ 1300 N/mm ² | GU-50 HARDLUBE | G1/8" – G1" | 149 |

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| UNC | DIN 2184-1 | PS 55 | ANSI B 1.1 |
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|---------|--|------------|-----|--------------|--|-----------------------------|---------------------------|-------------------------|-----|
| 520 403 | | Typ UNI | 2BX | B [3,5-5] | | ≤ 1300 N/mm ² | GU-B HARDLUBE | UNC #2-56 – UNC 1"-8 | 150 |
| 520 703 | | Typ UNI | 2BX | C [2-3] | | ≤ 1300 N/mm ² | GU-50 HARDLUBE | UNC #2-56 – UNC 1"-8 | 150 |

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UNF **DIN 2184-1** **PS 55** **ANSI B 1.1**

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|---------|--|---------|-----|------------|---------------------------------|-----------------------|-----------------------|-----|
| 530 403 | | Typ UNI | 2BX | B 3,5-5 | ≤ 1300 N/mm ² | GU-B HARDLUBE | UNF #4-48 – UNF 1"-12 | 151 |
| 530 703 | | Typ UNI | 2BX | C 2-3 | 50° ≤ 1300 N/mm ² | GU-50 HARDLUBE | UNF #4-48 – UNF 1"-12 | 151 |

M **DIN 371** **DIN 376** **PS 55** **DIN 13**

| | | | | | | | | |
|---------|--|------------|----------|------------|---------------------------------|-------------------|------------|-----|
| 571 143 | | Typ VA | ISO 2 6H | B 3,5-5 | ≤ 1300 N/mm ² | VA-B TiCN | M3 – M10 | 152 |
| 576 143 | | Typ VA | ISO 2 6H | B 3,5-5 | ≤ 1300 N/mm ² | VA-B TiCN | M12 – M20 | 152 |
| 571 343 | | Typ VA | ISO 2 6H | C 2-3 | 50° ≤ 1300 N/mm ² | VA-50 TiCN | M3 – M10 | 153 |
| 576 343 | | Typ VA | ISO 2 6H | C 2-3 | 50° ≤ 1300 N/mm ² | VA-50 TiCN | M12 – M30 | 153 |
| 571 347 | | Typ VA IKA | ISO 2 6H | C 2-3 | 50° ≤ 1300 N/mm ² | VA-50 TiCN | M6 – M10 | 154 |
| 576 347 | | Typ VA IKA | ISO 2 6H | C 2-3 | 50° ≤ 1300 N/mm ² | VA-50 TiCN | M12 – M30 | 154 |
| 571 104 | | Typ H | ISO 2 6H | B 3,5-5 | ≤ 1300 N/mm ² | H-B TiCN | M2,5 – M10 | 155 |
| 576 104 | | Typ H | ISO 2 6H | B 3,5-5 | ≤ 1300 N/mm ² | H-B TiCN | M12 – M30 | 155 |
| 571 154 | | Typ H | ISO 2 6H | C 2-3 | 15° ≤ 1300 N/mm ² | H-15 TiCN | M2,5 – M10 | 156 |
| 576 154 | | Typ H | ISO 2 6H | C 2-3 | 15° ≤ 1300 N/mm ² | H-15 TiCN | M12 – M30 | 156 |
| 571 281 | | Typ GG | 6HX | C 2-3 | ≤ 45 HRC | GG-H-FT | M3 – M10 | 157 |
| 576 281 | | Typ GG | 6HX | C 2-3 | ≤ 45 HRC | GG-H-FT | M12 – M24 | 157 |
| 571 381 | | Typ GG | 6HX | E 1,5-2 | ≤ 45 HRC | GG-H-FT | M3 – M10 | 158 |
| 576 381 | | Typ GG | 6HX | E 1,5-2 | ≤ 45 HRC | GG-H-FT | M12 – M24 | 158 |

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M DIN 371 DIN 376 **PS 55** DIN 13

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|---------|--|--------|-----|-----|-----------|----------|---------|-----------|-----|
| 571 278 | | Typ GG | IKA | 6HX | C [2-3] | ≤ 45 HRC | GG-H-FT | M6 – M10 | 159 |
| 576 278 | | Typ GG | IKA | 6HX | C [2-3] | ≤ 45 HRC | GG-H-FT | M12 – M20 | 159 |
| 571 387 | | Typ GG | IKA | 6HX | E [1,5-2] | ≤ 45 HRC | GG-H-FT | M6 – M10 | 160 |
| 576 387 | | Typ GG | IKA | 6HX | E [1,5-2] | ≤ 45 HRC | GG-H-FT | M12 – M20 | 160 |
| 571 288 | | Typ GG | IKR | 6HX | C [2-3] | ≤ 45 HRC | GG-H-FT | M6 – M10 | 161 |
| 576 288 | | Typ GG | IKR | 6HX | C [2-3] | ≤ 45 HRC | GG-H-FT | M12 – M20 | 161 |



MF DIN 374 **PS 55** DIN 13

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|---------|--|--------|-----|-----|---------|----------|---------|-----------------------|-----|
| 574 281 | | Typ GG | | 6HX | C [2-3] | ≤ 45 HRC | GG-H-FT | M3 x 0,35 – M24 x 1,5 | 162 |
| 574 278 | | Typ GG | IKA | 6HX | C [2-3] | ≤ 45 HRC | GG-H-FT | M8 x 1,0 – M20 x 1,5 | 163 |
| 574 288 | | Typ GG | IKR | 6HX | C [2-3] | ≤ 45 HRC | GG-H-FT | M8 x 1,0 – M20 x 1,5 | 164 |

G DIN 5156 **PS 55** DIN ISO 228

| | | | | | | | | | |
|---------|--|--------|--|--|---------|----------|---------|-------------|-----|
| 580 281 | | Typ GG | | | C [2-3] | ≤ 45 HRC | GG-H-FT | G1/8" – G1" | 165 |
|---------|--|--------|--|--|---------|----------|---------|-------------|-----|

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M DIN 371 DIN 376 PS 55 DIN 13

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|---------|--|--------|----------|------------|---------------------------------|----------|-----------|-----|
| 571 103 | | Typ Ti | ISO 2 6H | B 3,5-5 | ≤ 1500 N/mm ² | Ti-B OX | M3 – M10 | 166 |
| 576 103 | | Typ Ti | ISO 2 6H | B 3,5-5 | ≤ 1500 N/mm ² | Ti-B OX | M12 – M20 | 166 |
| 571 153 | | Typ Ti | ISO 2 6H | C 2-3 | 15° ≤ 1500 N/mm ² | Ti-15 OX | M3 – M10 | 167 |
| 576 153 | | Typ Ti | ISO 2 6H | C 2-3 | 15° ≤ 1500 N/mm ² | Ti-15 OX | M12 – M20 | 167 |
| 571 109 | | Typ Ni | ISO 2 6H | B 3,5-5 | ≤ 1500 N/mm ² | Ni-B | M3 – M10 | 168 |
| 576 109 | | Typ Ni | ISO 2 6H | B 3,5-5 | ≤ 1500 N/mm ² | Ni-B | M12 | 168 |
| 571 119 | | Typ Ni | ISO 2 6H | C 2-3 | 10° ≤ 1500 N/mm ² | Ni-10 | M3 – M10 | 169 |
| 576 119 | | Typ Ni | ISO 2 6H | C 2-3 | 10° ≤ 1500 N/mm ² | Ni-10 | M12 | 169 |

MJ DIN 371 DIN 376 PS 55 DIN ISO 5855

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|---------|--|--------|----------|----------|---------------------------------|-------|------------|-----|
| 573 119 | | Typ Ni | ISO 1 4H | C 2-3 | 10° ≤ 1500 N/mm ² | Ni-10 | MJ3 – MJ16 | 170 |
|---------|--|--------|----------|----------|---------------------------------|-------|------------|-----|

UNJC DIN 2184-1 PS 55 ANSI B 1.15

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|---------|--|--------|----|----------|---------------------------------|-------|---------------------------|-----|
| 523 119 | | Typ Ni | 3B | C 2-3 | 10° ≤ 1500 N/mm ² | Ni-10 | UNJC #4-40 – UNJC 3/8"-16 | 171 |
|---------|--|--------|----|----------|---------------------------------|-------|---------------------------|-----|

UNJF DIN 2184-1 PS 55 ANSI B 1.15

| | | | | | | | | |
|---------|--|--------|----|----------|---------------------------------|-------|---------------------------|-----|
| 533 119 | | Typ Ni | 3B | C 2-3 | 10° ≤ 1500 N/mm ² | Ni-10 | UNJF #6-40 – UNJF 3/8"-24 | 172 |
|---------|--|--------|----|----------|---------------------------------|-------|---------------------------|-----|

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M Typ **HS** **PS 55** DIN 13

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|---------|--|-------------|-----|--------------|---|--------------------|----------|-----|
| 900 140 | | Typ UNI | 6HX | B [3,5-5] | ≤ 1200 N/mm ² | HS-GU-B TiCN | M2 – M20 | 176 |
| 900 141 | | Typ UNI | 6HX | D [3,5-5] | LSP 20° ≤ 1200 N/mm ² | HS-GU- L20 TiCN | M2 – M20 | 176 |
| 900 440 | | Typ UNI | 6HX | C [2-3] | 50° ≤ 1200 N/mm ² | HS-GU-50 TiCN | M2 – M20 | 177 |
| 900 447 | | Typ UNI IKA | 6HX | C [2-3] | 50° ≤ 1200 N/mm ² | HS-GU-50 TiCN | M5 – M20 | 177 |
| 900 410 | | Typ W/45° | 6HX | C [2-3] | 45° | HS-W-45 CrN | M3 – M10 | 177 |

M PS 105 DIN 13

| | | | | | | | | |
|---------|--|------|-----|--------------|--------------|---------------|--|-----|
| 954 100 | | GH53 | 6HX | D [3,5-5] | 42~53 HRC | GH53- TiCN | M3 – M24 | 178 |
| 954 200 | | GH53 | 6HX | C [2-3] | 42~53 HRC | GH53- TiCN | M3 – M24 / M8x0,75 – M16x1,5 / G 1/8" – G 3/8" | 178 |

M VHM DIN 13

| | | | | | | | | |
|---------|--|------|-----|--------------|--------------|---------------|---|-----|
| 914 100 | | GH63 | 6HX | D [3,5-5] | 50~63 HRC | GH63- TiCN | M3 – M20 / M8x1 – M20x1,5 / G 1/8" / G 1/4" | 179 |
| 914 200 | | GH63 | 6HX | C [2-3] | 50~63 HRC | GH63- TiCN | M3 – M20 / M8x1 – M20x1,5 / G 1/8" / G 1/4" | 179 |

Schneidöl
Huile de coupe

Cutting oil
Olio da taglio

990 050





178/179

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Catalogue no.
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Nr. di catalogo



M **DIN 352** **HSS** **DIN 13**

| | | | | | |
|---------|---|----------|-------------------------|----------|-----|
| 352 000 |  | Typ N | ≤ 800 N/mm ² | M1 – M30 | 181 |
| 352 008 |  | Typ N LH | ≤ 800 N/mm ² | M3 – M20 | 182 |

M **DIN 352** **HSSE** **DIN 13**

| | | | | | |
|---------|---|--------|--------------------------|----------------|-----|
| 352 003 |  | Typ VA | ≤ 1200 N/mm ² | VA-OX M2 – M16 | 183 |
| 352 503 |  | Typ VA | ≤ 1200 N/mm ² | VA-OX M2 – M16 | 184 |

MF **DIN 2181** **HSS** **DIN 13**

| | | | | | |
|---------|---|-------|-------------------------|---------------------|-----|
| 181 000 |  | Typ N | ≤ 800 N/mm ² | M3 x 0,35 – M30 x 2 | 185 |
|---------|---|-------|-------------------------|---------------------|-----|

G **DIN 5157** **HSS** **DIN ISO 228**

| | | | | | |
|---------|---|-------|-------------------------|-----------------|-----|
| 353 000 |  | Typ N | ≤ 800 N/mm ² | G 1/8" – G 3/4" | 187 |
|---------|---|-------|-------------------------|-----------------|-----|

UNC **DIN 2184-2** **HSS** **ANSI B 1.1**

| | | | | | |
|---------|---|-------|-------------------------|-------------------------|-----|
| 902 000 |  | Typ N | ≤ 800 N/mm ² | UNC #5-40 – UNC 3/4"-10 | 188 |
|---------|---|-------|-------------------------|-------------------------|-----|

UNF **DIN 2184-2** **HSS** **ANSI B 1.1**

| | | | | | |
|---------|---|-------|-------------------------|-------------------------|-----|
| 903 000 |  | Typ N | ≤ 800 N/mm ² | UNF #6-40 – UNF 3/4"-16 | 189 |
|---------|---|-------|-------------------------|-------------------------|-----|

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Catalogue no.
Catalogue n°
Nr. di catalogo



M **EN 22568** **HSS** **DIN 13**

| | | | | | | |
|---------|--|----------|----|-------------------------|----------|-----|
| 223 000 | | Typ N | 6g | ≤ 800 N/mm ² | M2 – M30 | 190 |
| 223 008 | | Typ N LH | 6g | ≤ 800 N/mm ² | M3 – M20 | 190 |

M **EN 22568** **HSSE PM** **DIN 13**

| | | | | | | |
|---------|--|--------|----|--------------------------|----------|-----|
| 223 003 | | Typ VA | 6g | ≤ 1200 N/mm ² | M3 – M22 | 190 |
|---------|--|--------|----|--------------------------|----------|-----|

MF **EN 22568** **HSS** **DIN 13**

| | | | | | | |
|---------|--|-------|----|-------------------------|---------------------|-----|
| 223 100 | | Typ N | 6g | ≤ 800 N/mm ² | M3 x 0,35 – M30 x 2 | 191 |
|---------|--|-------|----|-------------------------|---------------------|-----|

G **EN 24231** **HSS** **DIN ISO 228**

| | | | | | | |
|---------|--|-------|--|-------------------------|-----------------|-----|
| 223 300 | | Typ N | | ≤ 800 N/mm ² | G 1/8" – G 3/4" | 192 |
|---------|--|-------|--|-------------------------|-----------------|-----|

UNC **EN 22568** **HSS** **ANSI B 1.1**

| | | | | | | |
|---------|--|-------|----|-------------------------|------------------------|-----|
| 223 400 | | Typ N | 2A | ≤ 800 N/mm ² | UNC #5-40 – UNC 7/8"-9 | 193 |
|---------|--|-------|----|-------------------------|------------------------|-----|

UNF **EN 22568** **HSS** **ANSI B 1.1**

| | | | | | | |
|---------|--|-------|----|-------------------------|-------------------------|-----|
| 223 500 | | Typ N | 2A | ≤ 800 N/mm ² | UNF #5-44 – UNF 7/8"-14 | 193 |
|---------|--|-------|----|-------------------------|-------------------------|-----|



Katalog-Nr.
Catalogue no.
Catalogue n°
Nr. di catalogo



| M | DIN 2174 | HSSE Co8 | DIN 13 | | | | | | | |
|---------|----------|----------|--------|-----------|--------------------------|--------------------------|-----------|-----------|-----|--|
| 371 504 | | Typ UNI | 6HX | C [2-3] | ≤ 1300 N/mm ² | TiCN | M1 – M10 | 195 | | |
| 376 504 | | Typ UNI | 6HX | C [2-3] | ≤ 1300 N/mm ² | TiCN | M12 – M30 | 195 | | |
| 371 754 | | Typ UNI | IKR | 6HX | C [2-3] | ≤ 1300 N/mm ² | TiCN | M6 – M10 | 196 | |
| 376 754 | | Typ UNI | IKR | 6HX | C [2-3] | ≤ 1300 N/mm ² | TiCN | M12 – M45 | 196 | |
| 371 204 | | Typ UNI | 6HX | E [1.5-2] | ≤ 1300 N/mm ² | TiCN | M3 – M10 | 197 | | |
| 376 204 | | Typ UNI | 6HX | E [1.5-2] | ≤ 1300 N/mm ² | TiCN | M12 – M16 | 197 | | |
| 371 604 | | Typ UNI | 6HX | D [3.5-5] | ≤ 1300 N/mm ² | TiCN | M2 – M10 | 198 | | |
| 376 604 | | Typ UNI | 6HX | D [3.5-5] | ≤ 1300 N/mm ² | TiCN | M12 – M16 | 198 | | |
| 371 564 | | Typ UNI | 6GX | C [2-3] | ≤ 1300 N/mm ² | TiCN | M3 – M10 | 199 | | |
| 376 564 | | Typ UNI | 6GX | C [2-3] | ≤ 1300 N/mm ² | TiCN | M12 – M16 | 199 | | |
| 371 574 | | Typ UNI | 7GX | C [2-3] | ≤ 1300 N/mm ² | TiCN | M3 – M10 | 200 | | |
| 376 574 | | Typ UNI | 7GX | C [2-3] | ≤ 1300 N/mm ² | TiCN | M12 – M16 | 200 | | |

| M | WEXO | extra lang extra long extra long extra lunghi | HSSE Co8 | DIN 13 | | | | | | |
|---------|------|--|----------|--------|---------|--------------------------|------|----------|-----|--|
| 957 504 | | | Typ UNI | 6HX | C [2-3] | ≤ 1300 N/mm ² | TiCN | M2 – M12 | 201 | |

| MF | DIN 2174 | HSSE Co8 | DIN 13 | | | | | | | |
|---------|----------|----------|--------|-----------|--------------------------|--------------------------|--------------------|--------------------|-----|--|
| 374 504 | | Typ UNI | 6HX | C [2-3] | ≤ 1300 N/mm ² | TiCN | M8 x 1 – M24 x 1,5 | 202 | | |
| 374 754 | | Typ UNI | IKR | 6HX | C [2-3] | ≤ 1300 N/mm ² | TiCN | M8 x 1 – M24 x 1,5 | 202 | |
| 374 604 | | Typ UNI | 6HX | D [3.5-5] | ≤ 1300 N/mm ² | TiCN | M8 x 1 – M20 x 1,5 | 203 | | |

Katalog-Nr.
Catalogue no.
Catalogue n°
Nr. di catalogo



| | | | | | | | | | |
|----------|-------------|-------------|-------------------|-----------------------------|-------------|--------------------|-----|--|--|
| G | DIN 2189 | HSSE Co8 | DIN ISO 228 | | | | | | |
| 980 504 | | Typ UNI | | ≤ 1300 N/mm ² | TiCN | G 1/8" – G 1/2" | 203 | | |

| | | | | | | | | |
|------------|---------------|-------------|---------------|-----------------------------|-------------|--------------------------|-----|--|
| UNC | DIN 2184-1 | HSSE Co8 | ANSI B 1.1 | | | | | |
| 920 504 | | Typ UNI | 2BX | ≤ 1300 N/mm ² | TiCN | UNC #6-40 – UNC 1"-12 | 204 | |

| | | | | | | | | |
|------------|---------------|-------------|---------------|-----------------------------|-------------|-------------------------|-----|--|
| UNF | DIN 2184-1 | HSSE Co8 | ANSI B 1.1 | | | | | |
| 930 504 | | Typ UNI | 2BX | ≤ 1300 N/mm ² | TiCN | UNF #5-40 – UNC 1"-8 | 204 | |

| | | | | | | | | |
|----------|-------------|-------------|-----------|--|--|--|--|--|
| M | DIN 2174 | HSSE Co5 | DIN 13 | | | | | |
|----------|-------------|-------------|-----------|--|--|--|--|--|

| | | | | | | | |
|---------|--|-----------|---------|-----------------------------|------------|-----------|-----|
| 371 891 | | Typ VA | 6HX | ≤ 1200 N/mm ² | TiN | M2 – M10 | 205 |
| 376 891 | | Typ VA | 6HX | ≤ 1200 N/mm ² | TiN | M12 – M16 | 205 |
| 371 791 | | Typ VA | IKR 6HX | ≤ 1200 N/mm ² | TiN | M6 – M10 | 206 |
| 376 791 | | Typ VA | IKR 6HX | ≤ 1200 N/mm ² | TiN | M12 – M16 | 206 |
| 371 892 | | Typ VA | 6GX | ≤ 1200 N/mm ² | TiN | M2 – M10 | 207 |
| 376 892 | | Typ VA | 6GX | ≤ 1200 N/mm ² | TiN | M12 – M16 | 207 |
| 371 792 | | Typ VA | IKR 6GX | ≤ 1200 N/mm ² | TiN | M6 – M10 | 208 |

| | | | | | | | | |
|-----------|-------------|-------------|-----------|-----------------------------|------------|--------------------------|-----|--|
| MF | DIN 2174 | HSSE Co5 | DIN 13 | | | | | |
| 374 891 | | Typ VA | 6HX | ≤ 1200 N/mm ² | TiN | M3 x 0,35 – M16 x 1,5 | 209 | |



Katalog-Nr.
Catalogue no.
Catalogue n°
Nr. di catalogo



| | | | | | | | | | |
|----------|-----------------|-----------------|--------------------|--------------------------|------------|------------------------|-----|--|--|
| G | DIN 2189 | HSSE Co5 | DIN ISO 228 | | | | | | |
| 980 891 | | Typ VA | | ≤ 1200 N/mm ² | TiN | G 1/8" – G 3/8" | 210 | | |

| | | | | | | | | | |
|----------|-----------------|------------|---------------|-----|--|--------------------------|--------------|-----------------|-----|
| M | DIN 2174 | VHM | DIN 13 | | | | | | |
| 914 851 | | Typ UNI | ≥ M6 IKR | 6HX | | ≤ 1200 N/mm ² | TiAlN | M3 – M12 | 211 |

Gewindefräser
Fraises à fileter

Thread milling cutters
Frese a filettare

| | | | | | | | | | |
|----------|--|------------|----------|--|--|----------|-------------|-----------------|-----|
| M | | VHM | | | | | | | |
| 914 440 | | Typ UNI | IKA | | | ≤ 54 HRC | TiCN | M6 – M20 | 215 |
| 914 445 | | Typ UNI | ≥ M4 IKA | | | ≤ 54 HRC | TiCN | M3 – M20 | 216 |

| | | | | | | | | | |
|-----------|--|------------|----------|--|--|----------|-------------|-----------------------------|-----|
| MF | | VHM | | | | | | | |
| 914 440 | | Typ UNI | IKA | | | ≤ 54 HRC | TiCN | M8 x 1 – M20 x 1,5 | 215 |
| 914 445 | | Typ UNI | ≥ M4 IKA | | | ≤ 54 HRC | TiCN | M4 x 0,5 – M16 x 1,5 | 216 |

| | | | | | | | | | |
|----------|--|------------|----------|--|--|----------|-------------|------------------------|-----|
| G | | VHM | | | | | | | |
| 914 440 | | Typ UNI | IKA | | | ≤ 54 HRC | TiCN | G 1/8" – G 3/8" | 215 |
| 914 445 | | Typ UNI | ≥ M4 IKA | | | ≤ 54 HRC | TiCN | G 1/8" – G 3/8" | 216 |

Katalog-Nr.
Catalogue no.
Catalogue n°
Nr. di catalogo



914 450



Typ
H

LH

IKZ



≤ 65
HRC

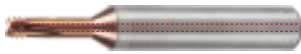
AlTiN-
TiSiN

M3 – M16

220



914 450



Typ
H

LH

IKZ



≤ 65
HRC

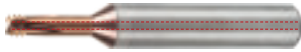
AlTiN-
TiSiN

M4 x 0,5 –
M12 x 1,5

220



914 450



Typ
H

LH

IKZ



≤ 65
HRC

AlTiN-
TiSiN

G 1/16" –
G 3/4"

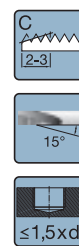
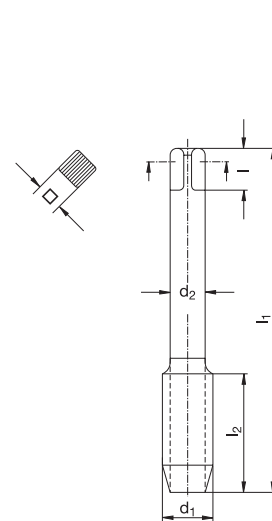
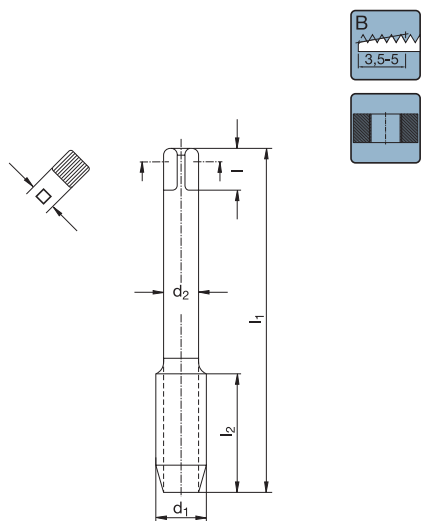
220





M

HSSE-
V3

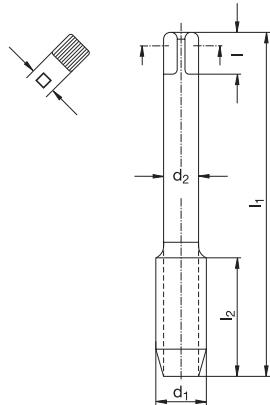
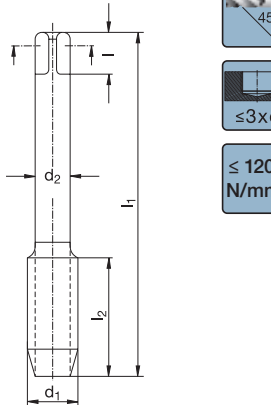


| | | | | | |
|---|--|------------------------------------|---|--|------------------------------------|
| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 970 100 ¹²⁰ - | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 970 150 ¹²⁰ - |
|---|--|------------------------------------|---|--|------------------------------------|

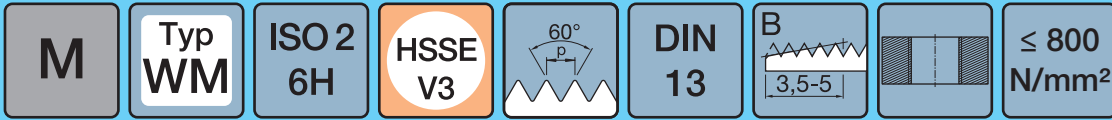
| | | | | | |
|---|--|---|---|--|---|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 |
|---|--|---|---|--|---|

| d ₁ [mm] | | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
|------------------------|------|-----------|------------------------|------------------------|------------------------|-----------|-----------|------|-----------|------|------------------------|----|-----------|------------------------|------------------------|------------------------|-----------|-----------|---------|-----------|------|--|
| M 2 | 0,4 | 36 | 8 | 2,8 | 5 | 2,1 | 2 | 1,6 | 060 031 | M 3 | 0,5 | 40 | 5 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 064 | | | |
| M 2,5 | 0,45 | 40 | 9 | 2,8 | 5 | 2,1 | 2 | 2,05 | 060 034 | M 4 | 0,7 | 45 | 7 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 066 | | | |
| M 3 | 0,5 | 40 | 11 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 036 | M 5 | 0,8 | 50 | 8 | 6 | 8 | 4,9 | 3 | 4,2 | 060 067 | | | |
| M 4 | 0,7 | 45 | 12 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 038 | M 6 | 1 | 56 | 10 | 6 | 8 | 4,9 | 3 | 5 | 060 068 | | | |
| M 5 | 0,8 | 50 | 16 | 6 | 8 | 4,9 | 3 | 4,2 | 060 039 | M 8 | 1,25 | 63 | 13 | 6 | 8 | 4,9 | 3 | 6,8 | 060 069 | | | |
| M 6 | 1 | 56 | 19 | 6 | 8 | 4,9 | 3 | 5 | 060 040 | M 10 | 1,5 | 70 | 15 | 7 | 8 | 5,5 | 3 | 8,5 | 060 070 | | | |
| M 8 | 1,25 | 63 | 22 | 6 | 8 | 4,9 | 3 | 6,8 | 060 041 | M 12 | 1,75 | 75 | 18 | 9 | 10 | 7 | 3 | 10,2 | 060 071 | | | |
| M 10 | 1,5 | 70 | 24 | 7 | 8 | 5,5 | 3 | 8,5 | 060 042 | | | | | | | | | | | | | |
| M 12 | 1,75 | 75 | 28 | 9 | 10 | 7 | 3 | 10,2 | 060 043 | | | | | | | | | | | | | |



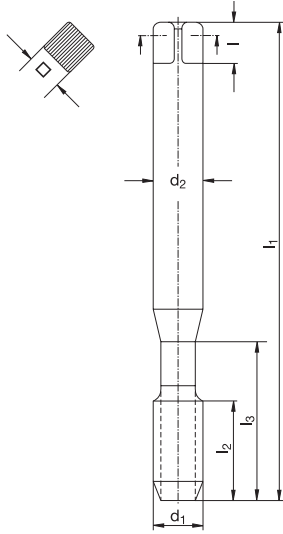
|  <div style="display: flex; flex-direction: column; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">Typ N</div> <div style="border: 1px solid black; padding: 2px;">40°</div> <div style="border: 1px solid black; padding: 2px;">$\leq 2,5 \times d$</div> <div style="border: 1px solid black; padding: 2px;">≤ 800 N/mm²</div> </div> | | | | | | | | | |  <div style="display: flex; flex-direction: column; gap: 5px;"> <div style="border: 1px solid black; padding: 2px;">Typ VA</div> <div style="border: 1px solid black; padding: 2px;">45°</div> <div style="border: 1px solid black; padding: 2px;">$\leq 3 \times d$</div> <div style="border: 1px solid black; padding: 2px;">≤ 1200 N/mm²</div> </div> | | | | | | | | | | | |
|---|------|-----------|------------------------|------------------------|---|-----------|-----------|------|-----------|--|------------------------|----|-----------|------------------------|--|------------------------|-----------|-----------|---------|-----------|------|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | | |
| d ₁ [mm] | | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code | d ₁ [mm] | | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code |
| 970 300 ¹²⁰ - | | | | | | | | | | 970 053 ¹³⁰ VA - OX | | | | | | | | | | | |
| 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | | | | | | | | | | | |
| M 2 | 0,4 | 36 | 8 | 2,8 | 5 | 2,1 | 2 | 1,6 | 060 075 | M 2 | 0,4 | 36 | 8 | 2,8 | 5 | 2,1 | 2 | 1,6 | 030 310 | | |
| M 3 | 0,5 | 40 | 5 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 078 | M 2,5 | 0,45 | 40 | 9 | 2,8 | 5 | 2,1 | 2 | 2,05 | 030 311 | | |
| M 4 | 0,7 | 45 | 7 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 080 | M 3 | 0,5 | 40 | 5 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 312 | | |
| M 5 | 0,8 | 50 | 8 | 6 | 8 | 4,9 | 3 | 4,2 | 060 081 | M 4 | 0,7 | 45 | 7 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 313 | | |
| M 6 | 1 | 56 | 10 | 6 | 8 | 4,9 | 3 | 5 | 060 082 | M 5 | 0,8 | 50 | 8 | 6 | 8 | 4,9 | 3 | 4,2 | 030 315 | | |
| M 8 | 1,25 | 63 | 13 | 6 | 8 | 4,9 | 3 | 6,8 | 060 083 | M 6 | 1 | 56 | 10 | 6 | 8 | 4,9 | 3 | 5 | 030 316 | | |
| M 10 | 1,5 | 70 | 15 | 7 | 8 | 5,5 | 3 | 8,5 | 060 084 | | | | | | | | | | | | |
| M 12 | 1,75 | 75 | 18 | 9 | 10 | 7 | 3 | 10,2 | 060 085 | | | | | | | | | | | | |
| M 16 | 2 | 80 | 20 | 12 | 12 | 9 | 3 | 14 | 060 087 | | | | | | | | | | | | |



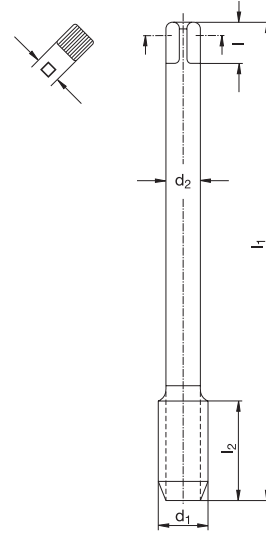


M

HSSE-
V3



DIN
371



DIN
376



Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n° ^{W%}

Nr. di catalogo ^{W%}

371 107¹²⁰
WM - OX

Katalog-Nr. ^{W%}
Catalogue n° ^{W%}

Catalogue no. ^{W%}
Nr. di catalogo ^{W%}

376 107¹²⁰
WM - OX

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1.1-1.3

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1.1-1.3

| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] |
|------------------------|-----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|
|------------------------|-----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|

Code

| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] |
|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|
|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|

Code

| | | | | | | | | | | |
|-------|-------|-----|-----|----|-----|----|-----|---|------|---------|
| M 1 | *0,25 | 40 | 5,5 | - | 2,5 | 5 | 2,1 | 2 | 0,75 | 067 088 |
| M 1,2 | *0,25 | 40 | 5,5 | - | 2,5 | 5 | 2,1 | 2 | 0,95 | 067 090 |
| M 1,4 | *0,3 | 40 | 7 | - | 2,5 | 5 | 2,1 | 2 | 1,1 | 067 091 |
| M 1,6 | 0,35 | 40 | 8 | - | 2,5 | 5 | 2,1 | 2 | 1,25 | 067 092 |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 067 095 |
| M 2,3 | 0,4 | 45 | 9 | - | 2,8 | 5 | 2,1 | 2 | 1,9 | 067 097 |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 067 098 |
| M 2,6 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,1 | 067 099 |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 067 100 |
| M 3,5 | 0,6 | 56 | 12 | 20 | 4 | 6 | 3 | 3 | 2,9 | 067 101 |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 067 102 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 067 103 |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 067 104 |
| M 7 | 1 | 80 | 19 | 30 | 7 | 8 | 5,5 | 3 | 6 | 067 105 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 067 106 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 067 108 |

| | | | | | | | | | |
|------|------|-----|----|----|----|------|---|------|---------|
| M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 067 356 |
| M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 3 | 12 | 067 357 |
| M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 067 358 |
| M 18 | 2,5 | 125 | 34 | 14 | 14 | 11 | 3 | 15,5 | 067 359 |
| M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | 067 360 |
| M 22 | 2,5 | 140 | 34 | 18 | 17 | 14,5 | 3 | 19,5 | 067 361 |
| M 24 | 3 | 160 | 38 | 18 | 17 | 14,5 | 3 | 21 | 067 362 |
| M 27 | 3 | 160 | 38 | 20 | 19 | 16 | 4 | 24 | 067 363 |
| M 30 | 3,5 | 180 | 45 | 22 | 21 | 18 | 4 | 26,5 | 067 364 |
| M 33 | 3,5 | 180 | 50 | 25 | 23 | 20 | 4 | 29,5 | 067 365 |
| M 36 | 4 | 200 | 56 | 28 | 25 | 22 | 4 | 32 | 067 366 |

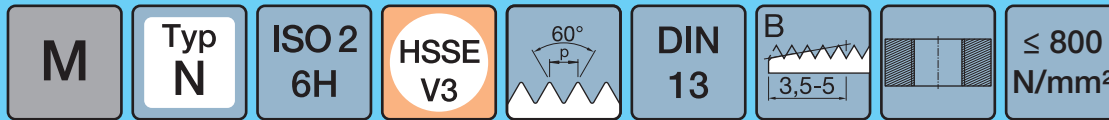
* M1; M1,2; M1,4 = ISO1 (5H)

M
Typ WM
ISO 2 6H
HSSE V3
60°
DIN 13
C 2-3
40°
≤2,5xd
≤ 800 N/mm²

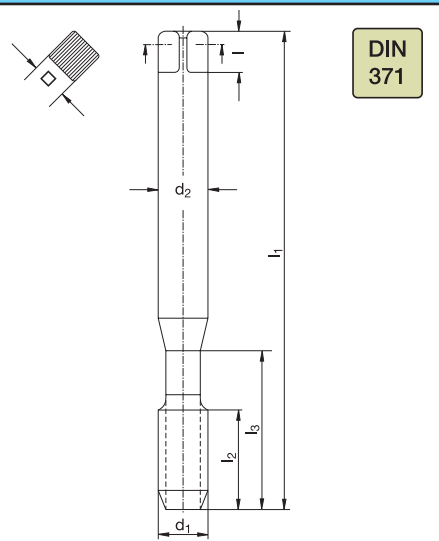
| DIN 371 | | | | | | | | | | | DIN 376 | | | | | | | | | | |
|---|-----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|---|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | |
| 371 307 ¹²⁰ | | | | | | | | | | | 376 307 ¹²⁰ | | | | | | | | | | |
| WM - OX | | | | | | | | | | | WM - OX | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | |
| 1.1-1.3 | | | | | | | | | | | 1.1-1.3 | | | | | | | | | | |
| Code | | | | | | | | | | | Code | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | | |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 062 001 | M 3 | 0,5 | 56 | 5 | 2,2 | - | - | 3 | 2,5 | 062 008 | |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 062 003 | M 4 | 0,7 | 63 | 7 | 2,8 | 5 | 2,1 | 3 | 3,3 | 062 009 | |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 062 004 | M 5 | 0,8 | 70 | 8 | 3,5 | 6 | 2,7 | 3 | 4,2 | 062 010 | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 062 005 | M 6 | 1 | 80 | 10 | 4,5 | 6 | 3,4 | 3 | 5 | 062 011 | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 062 006 | M 8 | 1,25 | 90 | 13 | 6 | 8 | 4,9 | 3 | 6,8 | 062 012 | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 062 007 | M 10 | 1,5 | 100 | 15 | 7 | 8 | 5,5 | 3 | 8,5 | 062 013 | |
| | | | | | | | | | | | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 3 | 10,2 | 063 001 | |
| | | | | | | | | | | | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 3 | 12 | 063 002 | |
| | | | | | | | | | | | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 3 | 14 | 063 003 | |
| | | | | | | | | | | | M 18 | 2,5 | 125 | 25 | 14 | 14 | 11 | 4 | 15,5 | 063 004 | |
| | | | | | | | | | | | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 063 005 | |
| | | | | | | | | | | | M 22 | 2,5 | 140 | 25 | 18 | 17 | 14,5 | 4 | 19,5 | 063 006 | |
| | | | | | | | | | | | M 24 | 3 | 160 | 30 | 18 | 17 | 14,5 | 4 | 21 | 063 007 | |
| | | | | | | | | | | | M 27 | 3 | 160 | 30 | 20 | 19 | 16 | 4 | 24 | 063 008 | |
| | | | | | | | | | | | M 30 | 3,5 | 180 | 35 | 22 | 21 | 18 | 4 | 26,5 | 063 009 | |
| | | | | | | | | | | | M 33 | 3,5 | 180 | 35 | 25 | 23 | 20 | 4 | 29,5 | 063 010 | |
| | | | | | | | | | | | M 36 | 4 | 200 | 40 | 28 | 25 | 22 | 4 | 32 | 063 011 | |

M

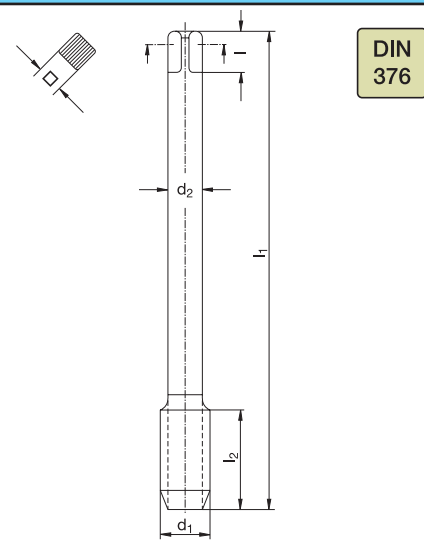
HSSE-V3



M
HSSE-
V3



DIN 371

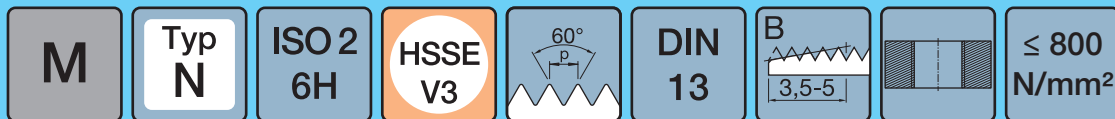


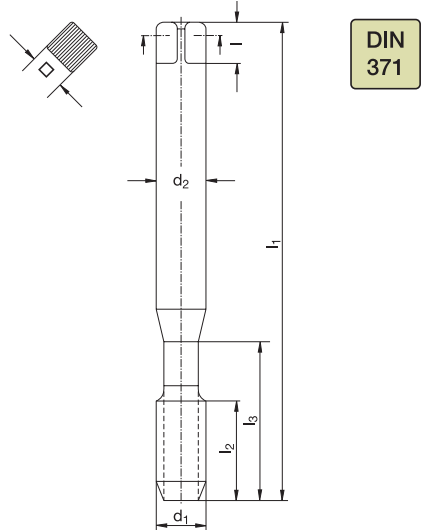
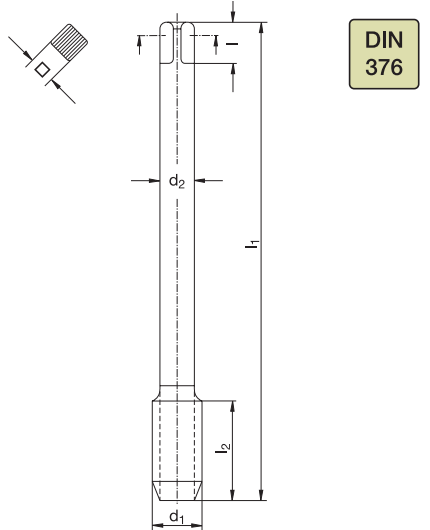
DIN 376



| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo W% | | | | | | | | | | 371 100 ¹²⁰ | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo W% | | | | | | | | | | 376 100 ¹²⁰ |
|--|---|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|---|--|---|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|--|---|
| Werkstoffgruppen Groupes de matières | | | | | | | | | | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | Werkstoffgruppen Groupes de matières | | | | | | | | | | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | | | |
| M 1,4* | 0,3 | 40 | 7 | - | 2,5 | 5 | 2,1 | 2 | 1,1 | 060 091 | M 2 | 0,4 | 45 | 8 | 1,4 | - | - | 2 | 1,6 | 060 344 | | | |
| M 1,6 | 0,35 | 40 | 8 | - | 2,5 | 5 | 2,1 | 2 | 1,25 | 060 092 | M 2,5 | 0,45 | 50 | 9 | 1,8 | - | - | 2 | 2,05 | 060 347 | | | |
| M 1,7 | 0,35 | 40 | 8 | - | 2,5 | 5 | 2,1 | 2 | 1,3 | 060 093 | M 3 | 0,5 | 56 | 11 | 2,2 | - | - | 3 | 2,5 | 060 349 | | | |
| M 1,8 | 0,35 | 40 | 8 | - | 2,5 | 5 | 2,1 | 2 | 1,45 | 060 094 | M 4 | 0,7 | 63 | 13 | 2,8 | 5 | 2,1 | 3 | 3,3 | 060 351 | | | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 060 095 | M 5 | 0,8 | 70 | 16 | 3,5 | 6 | 2,7 | 3 | 4,2 | 060 352 | | | |
| M 2,3 | 0,4 | 45 | 9 | - | 2,8 | 5 | 2,1 | 2 | 1,9 | 060 097 | M 6 | 1 | 80 | 19 | 4,5 | 6 | 3,4 | 3 | 5 | 060 353 | | | |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 060 098 | M 8 | 1,25 | 90 | 22 | 6 | 8 | 4,9 | 3 | 6,8 | 060 354 | | | |
| M 2,6 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,1 | 060 099 | M 10 | 1,5 | 100 | 24 | 7 | 8 | 5,5 | 3 | 8,5 | 060 355 | | | |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 100 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 060 356 | | | |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 102 | M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 3 | 12 | 060 357 | | | |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 060 103 | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 060 358 | | | |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 060 104 | M 18 | 2,5 | 125 | 34 | 14 | 14 | 11 | 3 | 15,5 | 060 359 | | | |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 060 106 | M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | 060 360 | | | |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 060 108 | M 22 | 2,5 | 140 | 34 | 18 | 17 | 14,5 | 3 | 19,5 | 060 361 | | | |
| M 12 | 1,75 | 110 | 28 | 45 | 12 | 12 | 9 | 3 | 10,2 | 060 109 | M 24 | 3 | 160 | 38 | 18 | 17 | 14,5 | 3 | 21 | 060 362 | | | |
| | | | | | | | | | | | M 27 | 3 | 160 | 38 | 20 | 19 | 16 | 4 | 24 | 060 363 | | | |
| | | | | | | | | | | | M 30 | 3,5 | 180 | 45 | 22 | 21 | 18 | 4 | 26,5 | 060 364 | | | |
| | | | | | | | | | | | M 33 | 3,5 | 180 | 50 | 25 | 23 | 20 | 4 | 29,5 | 060 365 | | | |
| | | | | | | | | | | | M 36 | 4 | 200 | 56 | 28 | 25 | 22 | 4 | 32 | 060 366 | | | |
| | | | | | | | | | | | M 39 | 4 | 200 | 60 | 32 | 27 | 24 | 4 | 35 | 060 367 | | | |
| | | | | | | | | | | | M 42 | 4,5 | 200 | 60 | 32 | 27 | 24 | 4 | 37,5 | 060 368 | | | |
| | | | | | | | | | | | M 45 | 4,5 | 220 | 65 | 36 | 32 | 29 | 4 | 40,5 | 060 369 | | | |
| | | | | | | | | | | | M 48 | 5 | 250 | 70 | 36 | 32 | 29 | 4 | 43 | 060 370 | | | |
| | | | | | | | | | | | M 52 | 5 | 250 | 70 | 40 | 35 | 32 | 4 | 47 | 060 371 | | | |

* M1,4 = ISO1 (5H)



|  | | | | | | | | | | |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|------|-----|----|----|-----|----|-----|---|-----|---------|--|------|-----|----|-----|----|------|---|------|---------|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|
| DIN 371 | | | | | | | | | | | DIN 376 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | | 371 190 ⁴²⁰ TiN | | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | | 376 190 ⁴²⁰ TiN | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | | 1.1-1.3 | | | | | | | | | | | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | | 1.1-1.3 | | | | | | | | | | |
| d₁ [mm] P [mm] l₁ [mm] l₂ [mm] l₃ [mm] d₂ [mm] l [mm] □ [mm] z ∅ [mm] | | | | | | | | | | | Code | | | | | | | | | | | d₁ [mm] P [mm] l₁ [mm] l₂ [mm] d₂ [mm] l [mm] □ [mm] z ∅ [mm] | | | | | | | | | | | Code | | | | | | | | | | |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 960 100 | M 3 | 0,5 | 56 | 11 | 2,2 | - | - | 3 | 2,5 | 960 349 | | | | | | | | | | | | | | | | | | | | | | | |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 960 102 | M 4 | 0,7 | 63 | 13 | 2,8 | 5 | 2,1 | 3 | 3,3 | 960 351 | | | | | | | | | | | | | | | | | | | | | | | |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 960 103 | M 5 | 0,8 | 70 | 16 | 3,5 | 6 | 2,7 | 3 | 4,2 | 960 352 | | | | | | | | | | | | | | | | | | | | | | | |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 960 104 | M 6 | 1 | 80 | 19 | 4,5 | 6 | 3,4 | 3 | 5 | 960 353 | | | | | | | | | | | | | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 960 106 | M 8 | 1,25 | 90 | 22 | 6 | 8 | 4,9 | 3 | 6,8 | 960 354 | | | | | | | | | | | | | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 960 108 | M 10 | 1,5 | 100 | 24 | 7 | 8 | 5,5 | 3 | 8,5 | 960 355 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 960 356 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 3 | 12 | 960 357 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 960 358 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | M 18 | 2,5 | 125 | 34 | 14 | 14 | 11 | 3 | 15,5 | 960 359 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | 960 360 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | M 22 | 2,5 | 140 | 34 | 18 | 17 | 14,5 | 3 | 19,5 | 960 361 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | M 24 | 3 | 160 | 38 | 18 | 17 | 14,5 | 3 | 21 | 960 362 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | M 27 | 3 | 160 | 38 | 20 | 19 | 16 | 4 | 24 | 960 363 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | M 30 | 3,5 | 180 | 45 | 22 | 21 | 18 | 4 | 26,5 | 960 364 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | M 33 | 3,5 | 180 | 50 | 25 | 23 | 20 | 4 | 29,5 | 960 365 | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | M 36 | 4 | 200 | 56 | 28 | 25 | 22 | 4 | 32 | 960 366 | | | | | | | | | | | | | | | | | | | | | | | |

M

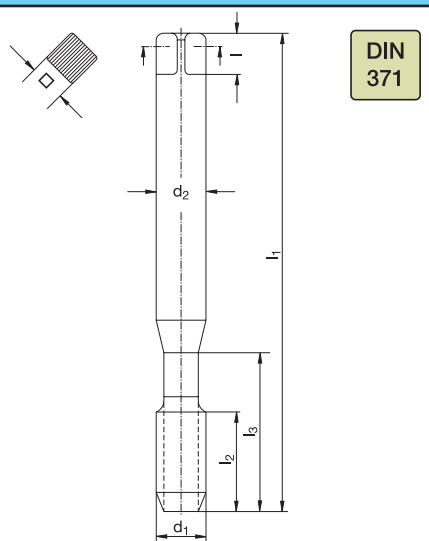
HSSE-V3



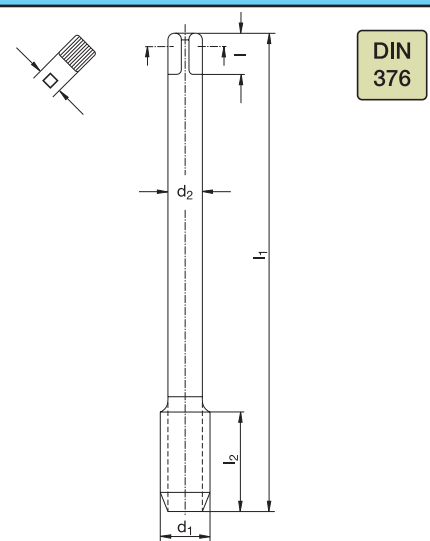


M

HSSE-
V3



DIN 371



DIN 376



Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}

Nr. di catalogo ^{W%}

371 108¹²⁰
-

Katalog-Nr. ^{W%}
Catalogue n^o ^{W%}

Nr. di catalogo ^{W%}

376 108¹²⁰
-

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1.1-1.3; 3.1; 3.3;
3.4; 4.1-4.3; 7.1

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1.1-1.3; 3.1; 3.3;
3.4; 4.1-4.3; 7.1

d₁ P l₁ l₂ l₃ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

Code

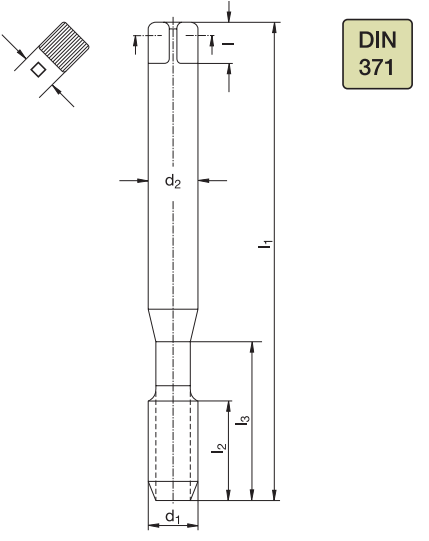

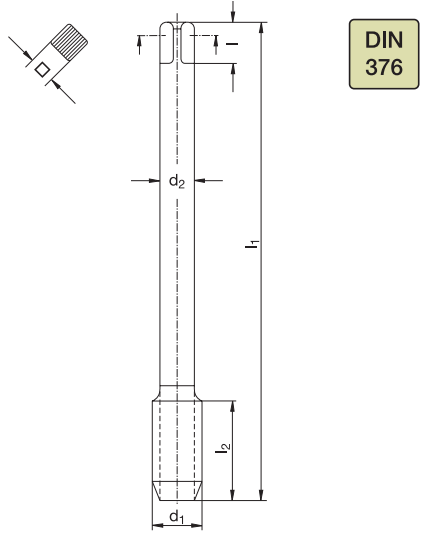

d₁ P l₁ l₂ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

Code

| | | | | | | | | | | |
|------|------|-----|----|----|-----|----|-----|---|-----|---------|
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 061 850 |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 061 851 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 061 852 |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 061 853 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 061 854 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 061 855 |

| | | | | | | | | | |
|------|------|-----|----|----|----|----|---|------|---------|
| M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 061 856 |
| M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 061 857 |
| M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | 061 859 |

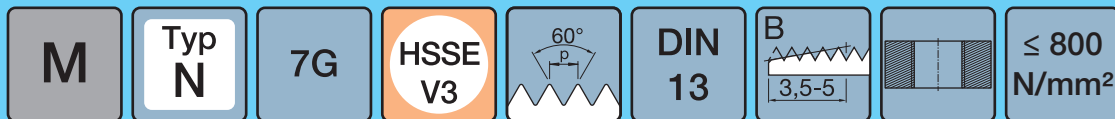
M
Typ N
ISO 3 6G
HSSE V3
60°
DIN 13
B
3,5-5
≤ 800 N/mm²

|  | |  | |  | |  | | | | | | | | | | | | | | |
|--|------|---|----|--|-----|---|-----|---|------|---------|------|------|-----|----|----|----|----|---|------|---------|
| Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | | 371 106 ¹²⁰ - | | Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | | 376 106 ¹²⁰ - | | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | |
| d ₁ [mm] P [mm] l ₁ [mm] l ₂ [mm] l ₃ [mm] d ₂ [mm] l [mm] □ [mm] z [mm] Ø [mm] | | Code | | d ₁ [mm] P [mm] l ₁ [mm] l ₂ [mm] d ₂ [mm] l [mm] □ [mm] z [mm] Ø [mm] | | Code | | | | | | | | | | | | | | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 060 114 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 063 160 |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 060 117 | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 063 162 |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 119 | M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | 063 164 |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 121 | | | | | | | | | | |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 060 122 | | | | | | | | | | |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 060 123 | | | | | | | | | | |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 060 124 | | | | | | | | | | |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 060 125 | | | | | | | | | | |
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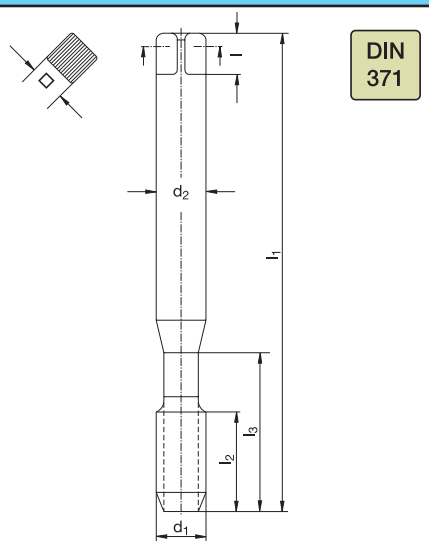
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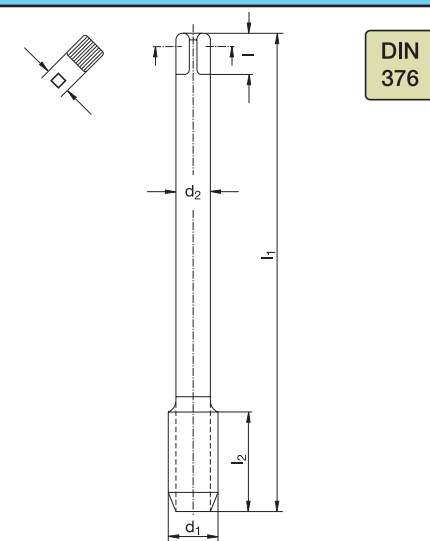




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DIN 371

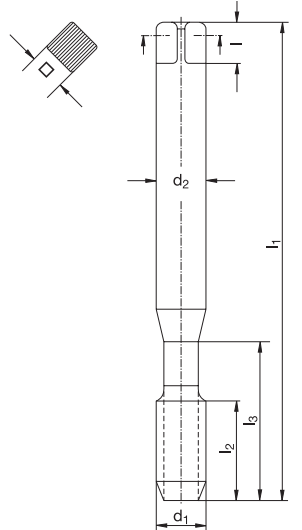

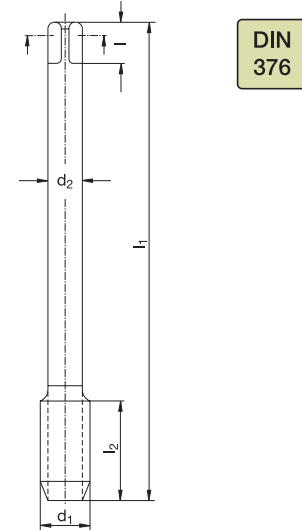



DIN 376



| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 371 170 ¹²⁰ - | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 376 170 ¹²⁰ - | | | | | | | | | | | | | | | | |
|--|--|---|--|--|---|-----------|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|
| Werkstoffgruppen Groupes de matières | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | Werkstoffgruppen Groupes de matières | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 500 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 060 510 | |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 502 | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 060 512 | |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 060 503 | M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | 060 514 | |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 060 504 | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 060 506 | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 060 508 | | | | | | | | | | | |

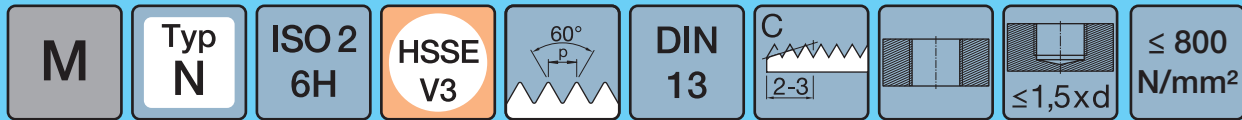
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|---|----------|----|-------------|------------|----------|-----------|------------|------------|----------------------------|
| M | Typ N | RH | ISO 2 6H | HSSE V3 | 60° P | DIN 13 | D 3,5-5 | LSP 15° | ≤ 800 N/mm ² |
|---|----------|----|-------------|------------|----------|-----------|------------|------------|----------------------------|

|  | | DIN 371 |  | |  | | DIN 376 |  | | |
|---|--|------------------------|---|---|--|------------------------|-----------|---|--|---------|
| Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 371 151 ¹²⁰ | - | Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 376 151 ¹²⁰ | - | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 689 |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 692 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 060 694 |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 060 696 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 060 697 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 10 | 8 | 3 | 8,5 | 060 698 |
| M 12 | 1,75 | 110 | 28 | 45 | 12 | 12 | 9 | 3 | 10,2 | 060 699 |
| M 16 | 2 | 110 | 32 | 55 | 16 | 12 | 9 | 3 | 14 | 060 701 |

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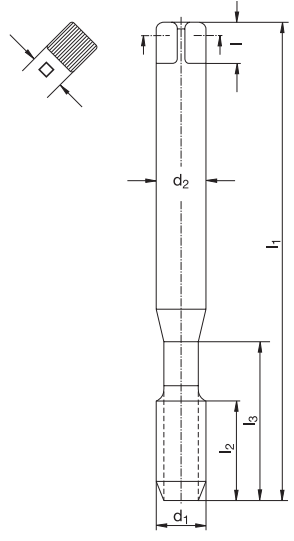
HSSE-V3



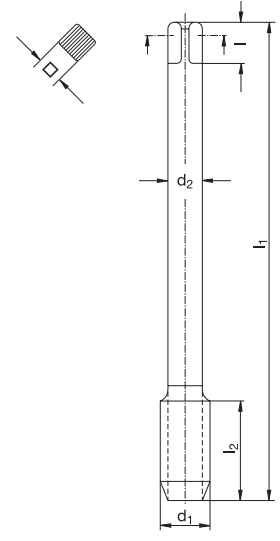


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DIN 371



DIN 376



| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 371 200 ¹²⁰ | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 376 200 ¹²⁰ | | | | | | | | | | | | | | |
|--|------|--|----|---|-----|--|-----|---|------|---------|------|------|-----|----|-----|----|------|---|------|---------|
| Catalogue n° ^{W%} Nr. di catalogo ^{W%} | | - | | Catalogue n° ^{W%} Nr. di catalogo ^{W%} | | - | | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | |
| | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | | | | | |
| d ₁ P l ₁ l ₂ l ₃ d ₂ l □ z Ø | | Code | | d ₁ P l ₁ l ₂ d ₂ l □ z Ø | | Code | | | | | | | | | | | | | | |
| [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | | | | | | | | | | | | | |
| M 1,4* | 0,3 | 40 | 7 | - | 2,5 | 5 | 2,1 | 3 | 1,1 | 060 128 | M 3 | 0,5 | 56 | 11 | 2,2 | - | - | 3 | 2,5 | 060 400 |
| M 1,6 | 0,35 | 40 | 8 | - | 2,5 | 5 | 2,1 | 3 | 1,25 | 060 129 | M 4 | 0,7 | 63 | 13 | 2,8 | 5 | 2,1 | 3 | 3,3 | 060 402 |
| M 1,7 | 0,35 | 40 | 8 | - | 2,5 | 5 | 2,1 | 3 | 1,3 | 060 130 | M 5 | 0,8 | 70 | 16 | 3,5 | 6 | 2,7 | 3 | 4,2 | 060 403 |
| M 1,8 | 0,35 | 40 | 8 | - | 2,5 | 5 | 2,1 | 3 | 1,45 | 060 131 | M 6 | 1 | 80 | 19 | 4,5 | 6 | 3,4 | 3 | 5 | 060 404 |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 3 | 1,6 | 060 132 | M 8 | 1,25 | 90 | 22 | 6 | 8 | 4,9 | 4 | 6,8 | 060 405 |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 3 | 2,05 | 060 135 | M 10 | 1,5 | 100 | 24 | 7 | 8 | 5,5 | 4 | 8,5 | 060 406 |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 137 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 4 | 10,2 | 060 407 |
| M 3,5 | 0,6 | 56 | 12 | 20 | 4 | 6 | 3 | 3 | 2,9 | 060 138 | M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 4 | 12 | 060 408 |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 139 | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 4 | 14 | 060 409 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 060 140 | M 18 | 2,5 | 125 | 34 | 14 | 14 | 11 | 4 | 15,5 | 060 410 |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 060 141 | M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 4 | 17,5 | 060 411 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 4 | 6,8 | 060 143 | M 22 | 2,5 | 140 | 34 | 18 | 17 | 14,5 | 4 | 19,5 | 060 412 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 4 | 8,5 | 060 145 | M 24 | 3 | 160 | 38 | 18 | 17 | 14,5 | 4 | 21 | 060 413 |
| | | | | | | | | | | | M 27 | 3 | 160 | 38 | 20 | 19 | 16 | 4 | 24 | 060 414 |
| | | | | | | | | | | | M 30 | 3,5 | 180 | 45 | 22 | 21 | 18 | 4 | 26,5 | 060 415 |
| | | | | | | | | | | | M 33 | 3,5 | 180 | 50 | 25 | 23 | 20 | 4 | 29,5 | 060 416 |
| | | | | | | | | | | | M 36 | 4 | 200 | 56 | 28 | 25 | 22 | 4 | 32 | 060 417 |
| | | | | | | | | | | | M 39 | 4 | 200 | 60 | 32 | 27 | 24 | 4 | 35 | 060 418 |
| | | | | | | | | | | | M 42 | 4,5 | 200 | 60 | 32 | 27 | 24 | 4 | 37,5 | 060 419 |

* M1,4 = ISO1 (5H)

M Typ N ISO 2 6H HSSE V3 60° P 6-8 DIN 13 A ≤ 800 N/mm²

| DIN 371 | | | | | | | | | | DIN 376 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|------|----------------|----------------|----------------|--|------|------|---|------|--|------|----------------|----------------|----------------|--|------|-----|------|----------------|---------|----------------|----------------|----------------|------|------|---|------|---|-----|---------|-----|-----|----|----|-----|---|-----|---|-----|---------|-----|---|----|----|-----|---|-----|---|---|---------|-----|------|----|----|---|---|-----|---|-----|---------|------|-----|-----|----|---|---|-----|---|-----|---------|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 371 700 ¹²⁰ | | | | | 371 700 ¹²⁰ | | | | | 376 700 ¹²⁰ | | | | | 376 700 ¹²⁰ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Code | | | | | | | | | | Code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | ∅ | d ₁ | P | l ₁ | l ₂ | d ₂ | l | □ | z | ∅ | d ₁ | P | l ₁ | l ₂ | d ₂ | l | □ | z | ∅ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 3 | 1,6 | 061 801 | M 3 | 0,5 | 56 | 11 | 2,2 | - | - | 3 | 2,5 | 061 814 | M 4 | 0,7 | 63 | 13 | 2,8 | 5 | 2,1 | 3 | 3,3 | 061 816 | M 5 | 0,8 | 70 | 16 | 3,5 | 6 | 2,7 | 3 | 4,2 | 061 817 | M 6 | 1 | 80 | 19 | 4,5 | 6 | 3,4 | 3 | 5 | 061 818 | M 8 | 1,25 | 90 | 22 | 6 | 8 | 4,9 | 4 | 6,8 | 061 819 | M 10 | 1,5 | 100 | 24 | 7 | 8 | 5,5 | 4 | 8,5 | 061 820 |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 3 | 2,05 | 061 798 | M 10 | 1,5 | 100 | 24 | 7 | 8 | 5,5 | 4 | 8,5 | 061 820 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

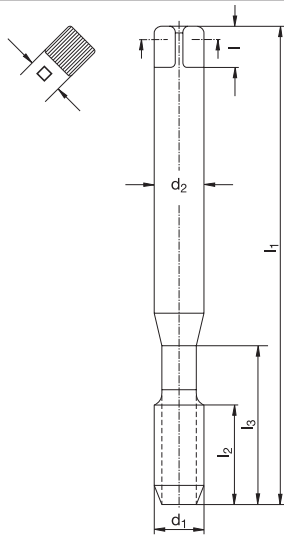
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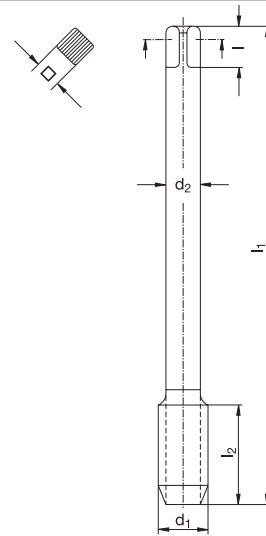


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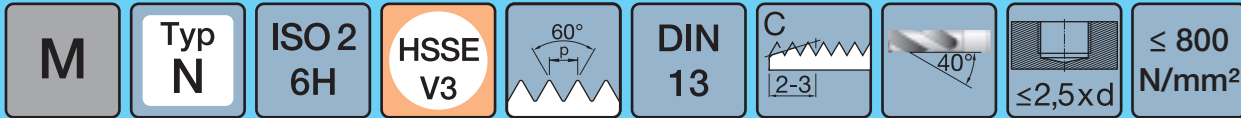
DIN
371

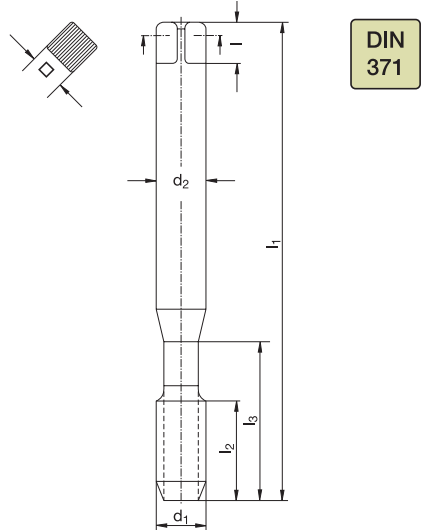
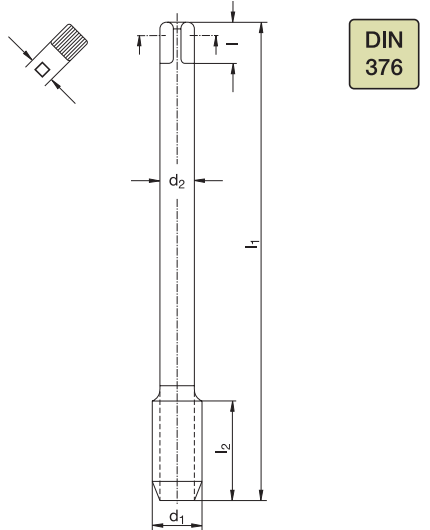


DIN
376



| Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 371 150 ¹²⁰ | Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 376 150 ¹²⁰ | | | | | | | | | | | | | | | |
|---|--|---|---|--|---|-----------|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|
| Werkstoffgruppen Groupes de matières | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | Werkstoffgruppen Groupes de matières | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 060 552 | M 3 | 0,5 | 56 | 5 | 2,2 | - | - | 3 | 2,5 | 060 618 |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 060 555 | M 4 | 0,7 | 63 | 7 | 2,8 | 5 | 2,1 | 3 | 3,3 | 060 620 |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 557 | M 5 | 0,8 | 70 | 8 | 3,5 | 6 | 2,7 | 3 | 4,2 | 060 621 |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 559 | M 6 | 1 | 80 | 10 | 4,5 | 6 | 3,4 | 3 | 5 | 060 622 |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 060 560 | M 8 | 1,25 | 90 | 13 | 6 | 8 | 4,9 | 3 | 6,8 | 060 623 |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 060 561 | M 10 | 1,5 | 100 | 15 | 7 | 8 | 5,5 | 3 | 8,5 | 060 624 |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 060 562 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 3 | 10,2 | 060 625 |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 060 563 | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 3 | 12 | 060 626 |
| | | | | | | | | | | | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 3 | 14 | 060 627 |
| | | | | | | | | | | | M 18 | 2,5 | 125 | 25 | 14 | 14 | 11 | 4 | 15,5 | 060 628 |
| | | | | | | | | | | | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 060 629 |
| | | | | | | | | | | | M 22 | 2,5 | 140 | 25 | 18 | 17 | 14,5 | 4 | 19,5 | 060 630 |
| | | | | | | | | | | | M 24 | 3 | 160 | 30 | 18 | 17 | 14,5 | 4 | 21 | 060 631 |
| | | | | | | | | | | | M 27 | 3 | 160 | 30 | 20 | 19 | 16 | 4 | 24 | 060 632 |
| | | | | | | | | | | | M 30 | 3,5 | 180 | 35 | 22 | 21 | 18 | 4 | 26,5 | 060 633 |
| | | | | | | | | | | | M 33 | 3,5 | 180 | 35 | 25 | 23 | 20 | 4 | 29,5 | 060 634 |
| | | | | | | | | | | | M 36 | 4 | 200 | 40 | 28 | 25 | 22 | 4 | 32 | 060 635 |

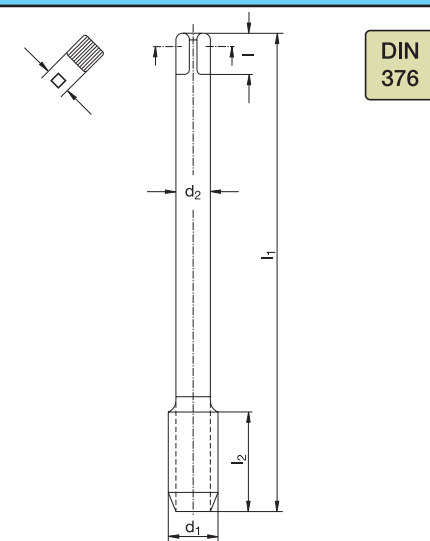
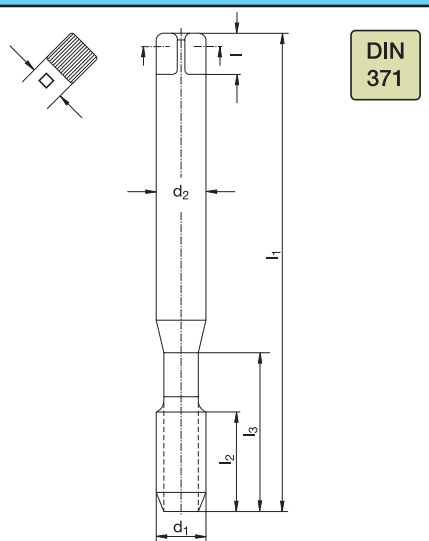


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|---|-----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|---|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 060 585 | M 3 | 0,5 | 56 | 5 | 2,2 | - | - | 3 | 2,5 | 060 653 | |
| M 2,3 | 0,4 | 45 | 9 | - | 2,8 | 5 | 2,1 | 2 | 1,9 | 060 587 | M 4 | 0,7 | 63 | 7 | 2,8 | 5 | 2,1 | 3 | 3,3 | 060 655 | |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 060 588 | M 5 | 0,8 | 70 | 8 | 3,5 | 6 | 2,7 | 3 | 4,2 | 060 656 | |
| M 2,6 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,1 | 060 589 | M 6 | 1 | 80 | 10 | 4,5 | 6 | 3,4 | 3 | 5 | 060 657 | |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 590 | M 8 | 1,25 | 90 | 13 | 6 | 8 | 4,9 | 3 | 6,8 | 060 658 | |
| M 3,5 | 0,6 | 56 | 6 | 20 | 4 | 6 | 3 | 3 | 2,9 | 060 591 | M 10 | 1,5 | 100 | 15 | 7 | 8 | 5,5 | 3 | 8,5 | 060 659 | |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 592 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 3 | 10,2 | 060 660 | |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 060 593 | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 3 | 12 | 060 661 | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 060 594 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 3 | 14 | 060 662 | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 060 595 | M 18 | 2,5 | 125 | 25 | 14 | 14 | 11 | 4 | 15,5 | 060 663 | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 060 596 | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 060 664 | |
| M 12 | 1,75 | 110 | 18 | 45 | 12 | 12 | 9 | 3 | 10,2 | 060 597 | M 22 | 2,5 | 140 | 25 | 18 | 17 | 14,5 | 4 | 19,5 | 060 665 | |
| | | | | | | | | | | | M 24 | 3 | 160 | 30 | 18 | 17 | 14,5 | 4 | 21 | 060 666 | |
| | | | | | | | | | | | M 27 | 3 | 160 | 30 | 20 | 19 | 16 | 4 | 24 | 060 667 | |
| | | | | | | | | | | | M 30 | 3,5 | 180 | 35 | 22 | 21 | 18 | 4 | 26,5 | 060 668 | |
| | | | | | | | | | | | M 33 | 3,5 | 180 | 35 | 25 | 23 | 20 | 4 | 29,5 | 060 669 | |
| | | | | | | | | | | | M 36 | 4 | 200 | 40 | 28 | 25 | 22 | 4 | 32 | 060 670 | |





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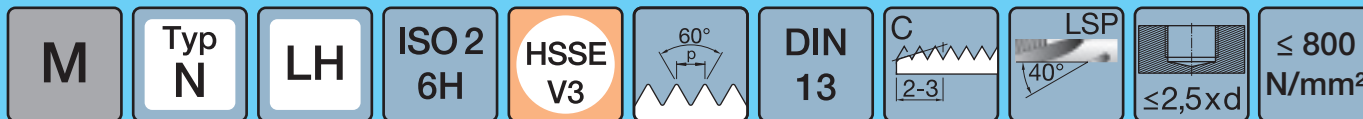
| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 371 320 ¹²⁰ - | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 376 320 ¹²⁰ - | | | | | | | | | | | | | | | | |
|--|--|---|--|--|---|-----------|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|
| Werkstoffgruppen Groupes de matières | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | Werkstoffgruppen Groupes de matières | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 600 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 3 | 10,2 | 060 609 | |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 602 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 3 | 14 | 060 611 | |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 060 603 | | | | | | | | | | | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 060 604 | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 060 606 | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 060 608 | | | | | | | | | | | |

| | | | | | | | | | |
|---|----------|-------------|------------|----------|-----------|----------|-----|------|----------------------------|
| M | Typ N | ISO 2 6H | HSSE V3 | 60° P | DIN 13 | C 2-3 | 45° | ≤3xd | ≤ 800 N/mm ² |
|---|----------|-------------|------------|----------|-----------|----------|-----|------|----------------------------|

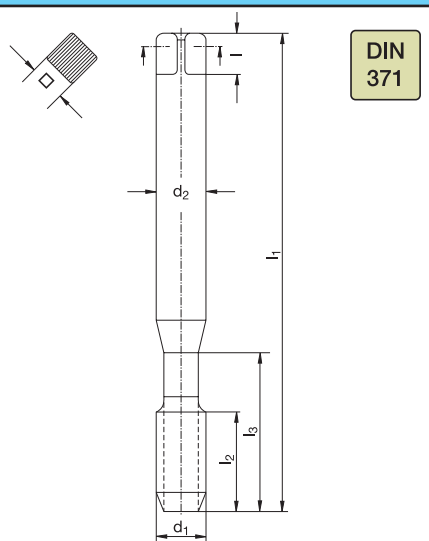
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|--|-----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|
| | | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | |
| 371 390 ⁴²⁰ | | | | | | | | | | | 376 390 ⁴²⁰ | | | | | | | | | | |
| TiN | | | | | | | | | | | TiN | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | |
| 1.1-1.3 | | | | | | | | | | | 1.1-1.3 | | | | | | | | | | |
| Code | | | | | | | | | | | Code | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 960 590 | M 3 | 0,5 | 56 | 5 | 2,2 | - | - | 3 | 2,5 | 960 653 | |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 960 592 | M 4 | 0,7 | 63 | 7 | 2,8 | 5 | 2,1 | 3 | 3,3 | 960 655 | |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 960 593 | M 5 | 0,8 | 70 | 8 | 3,5 | 6 | 2,7 | 3 | 4,2 | 960 656 | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 960 594 | M 6 | 1 | 80 | 10 | 4,5 | 6 | 3,4 | 3 | 5 | 960 657 | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 960 595 | M 8 | 1,25 | 90 | 13 | 6 | 8 | 4,9 | 3 | 6,8 | 960 658 | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 960 596 | M 10 | 1,5 | 100 | 15 | 7 | 8 | 5,5 | 3 | 8,5 | 960 659 | |
| | | | | | | | | | | | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 3 | 10,2 | 960 660 | |
| | | | | | | | | | | | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 3 | 12 | 960 661 | |
| | | | | | | | | | | | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 3 | 14 | 960 662 | |
| | | | | | | | | | | | M 18 | 2,5 | 125 | 25 | 14 | 14 | 11 | 4 | 15,5 | 960 663 | |
| | | | | | | | | | | | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 960 664 | |
| | | | | | | | | | | | M 22 | 2,5 | 140 | 25 | 18 | 17 | 14,5 | 4 | 19,5 | 960 665 | |
| | | | | | | | | | | | M 24 | 3 | 160 | 30 | 18 | 17 | 14,5 | 4 | 21 | 960 666 | |

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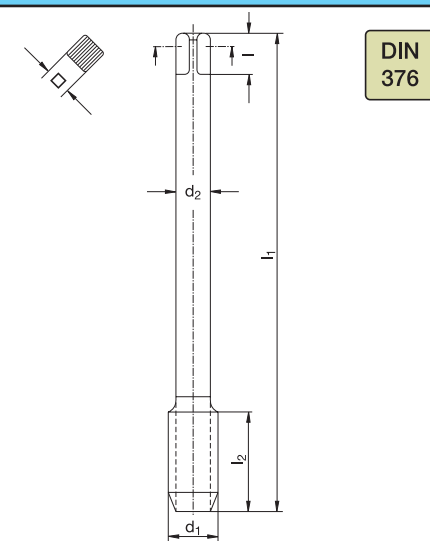
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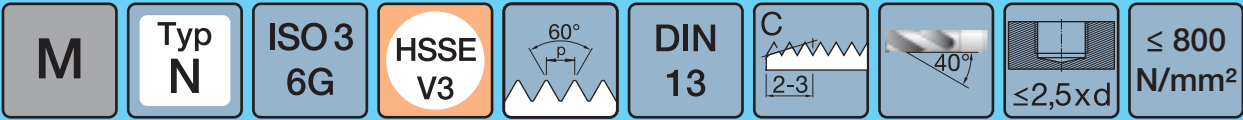
DIN 371

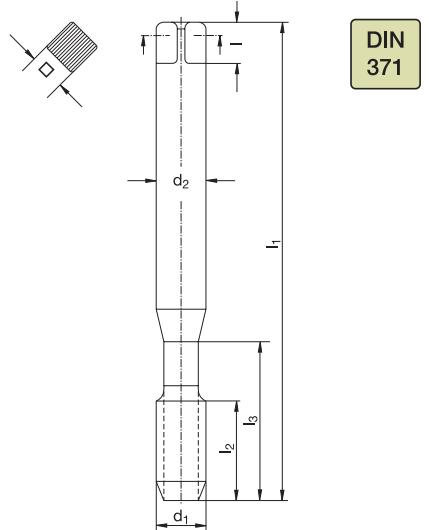
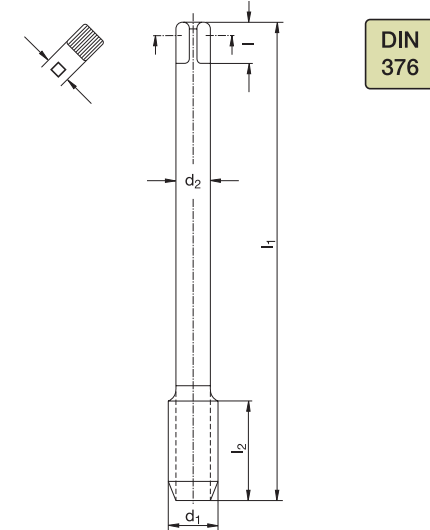


DIN 376



| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 371 308 ¹²⁰ | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 376 308 ¹²⁰ | | | | | | | | | | | | | | | |
|--|--|---|--|--|---|-----------|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|
| Werkstoffgruppen Groupes de matières | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | Werkstoffgruppen Groupes de matières | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 061 861 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 3 | 10,2 | 061 867 |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 061 862 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 3 | 14 | 061 869 |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 061 863 | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 061 871 |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 061 864 | | | | | | | | | | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 061 865 | | | | | | | | | | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 061 866 | | | | | | | | | | |

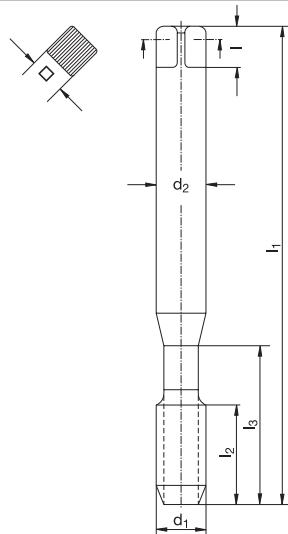


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|---|-----------------------------|--|-----------------------------|
| Katalog-Nr. ^{W%} | Catalogue no. ^{W%} | Katalog-Nr. ^{W%} | Catalogue no. ^{W%} |
| 371 306 ¹²⁰ | 376 306 ¹²⁰ | | |
| Werkstoffgruppen | | Werkstoffgruppen | |
| 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | |
| Code | | Code | |
| M 3 | 062 063 | M 12 | 062 072 |
| M 4 | 062 064 | M 14 | 062 074 |
| M 5 | 062 065 | M 16 | 062 076 |
| M 6 | 062 066 | M 18 | 062 078 |
| M 8 | 062 068 | M 20 | 062 080 |
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| M 12 | 062 071 | | |

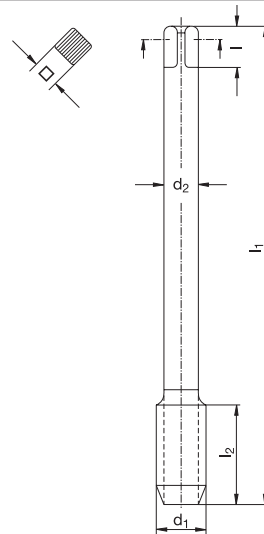




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DIN 371



DIN 376



| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 371 370 ¹²⁰ | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 376 370 ¹²⁰ | | | | | | | | | | | | | |
|--|--|------------------------|---|------------------------|--|--|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|
| Catalogue n ^o W% | - | | - | | Catalogue n ^o W% | - | | - | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 525 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 3 | 10,2 | 060 533 | |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 526 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 3 | 14 | 060 535 | |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 060 527 | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 060 537 | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 060 528 | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 060 530 | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 060 532 | | | | | | | | | | | |

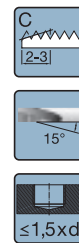
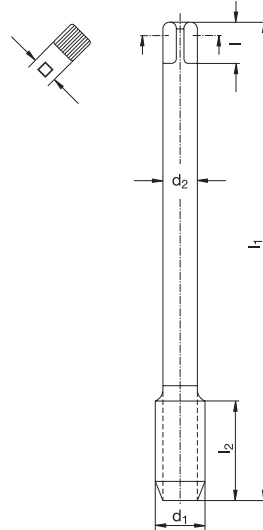
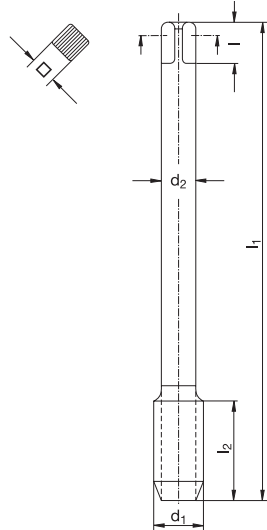


| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | |
| d₁ [mm] P [mm] l₁ [mm] l₂ [mm] l₄ [mm] d₂ [mm] l [mm] □ [mm] z Ø [mm] | | | | | | | | | | d₁ [mm] P [mm] l₁ [mm] l₂ [mm] l₄ [mm] d₂ [mm] l [mm] □ [mm] z Ø [mm] | | | | | | | | | |
| M 3 0,5 70 22 16 2,2 - - 3 2,5 | | | | | | | | | | M 3 0,5 70 22 16 2,2 - - 3 2,5 | | | | | | | | | |
| M 4 0,7 90 25 18 2,8 5 2,1 3 3,3 | | | | | | | | | | M 4 0,7 90 25 18 2,8 5 2,1 3 3,3 | | | | | | | | | |
| M 5 0,8 100 28 20 3,5 6 2,7 3 4,2 | | | | | | | | | | M 5 0,8 100 28 20 3,5 6 2,7 3 4,2 | | | | | | | | | |
| M 6 1 110 32 22 4,5 6 3,4 3 5 | | | | | | | | | | M 6 1 110 32 22 4,5 6 3,4 3 5 | | | | | | | | | |
| M 8 1,25 125 40 28 6 8 4,9 3 6,8 | | | | | | | | | | M 8 1,25 125 40 28 6 8 4,9 3 6,8 | | | | | | | | | |
| M 10 1,5 140 45 32 7 8 5,5 3 8,5 | | | | | | | | | | M 10 1,5 140 45 32 7 8 5,5 3 8,5 | | | | | | | | | |
| M 12 1,75 180 50 36 9 10 7 3 10,2 | | | | | | | | | | M 12 1,75 180 50 36 9 10 7 3 10,2 | | | | | | | | | |
| M 16 2 200 63 40 12 12 9 3 14 | | | | | | | | | | M 16 2 200 63 40 12 12 9 3 14 | | | | | | | | | |
| M 20 2,5 250 70 50 16 15 12 3 17,5 | | | | | | | | | | | | | | | | | | | |
| 357 000 ¹²⁰ - | | | | | | | | | | 357 151 ¹²⁰ - | | | | | | | | | |
| Code | | | | | | | | | | Code | | | | | | | | | |

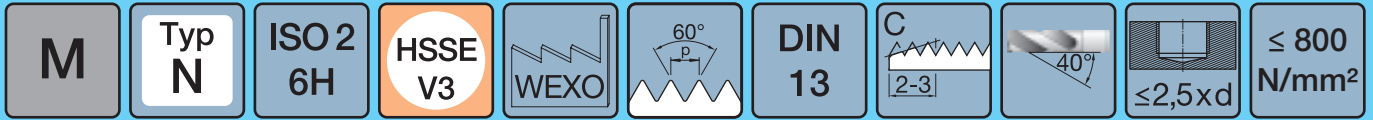
l₄ = Anschnittlänge / Chamfer length
Forme de L'entrée / Lunghezza imbocco



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V3



| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 957 100 ¹²⁰ | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 957 150 ¹²⁰ | | |
|--|-----------|--|------------------------|--|-----------|--|-----------|-----------|
| Catalogue n ^o ^{W%} | | - | | Catalogue n ^o ^{W%} | | - | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | |
| 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | |
| Code | | Code | | Code | | Code | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z [mm] | ∅ [mm] |
| M 3 | 0,5 | 112 | 11 | 2,2 | - | - | 3 | 2,5 |
| M 4 | 0,7 | 126 | 13 | 2,8 | 5 | 2,1 | 3 | 3,3 |
| M 5 | 0,8 | 140 | 16 | 3,5 | 6 | 2,7 | 3 | 4,2 |
| M 6 | 1 | 160 | 19 | 4,5 | 6 | 3,4 | 3 | 5 |
| M 8 | 1,25 | 180 | 22 | 6 | 8 | 4,9 | 3 | 6,8 |
| M 10 | 1,5 | 200 | 24 | 7 | 8 | 5,5 | 3 | 8,5 |
| M 12 | 1,75 | 220 | 28 | 9 | 10 | 7 | 3 | 10,2 |
| M 14 | 2 | 220 | 30 | 11 | 12 | 9 | 3 | 12 |
| M 16 | 2 | 220 | 32 | 12 | 12 | 9 | 3 | 14 |
| M 20 | 2,5 | 280 | 34 | 16 | 15 | 12 | 3 | 17,5 |

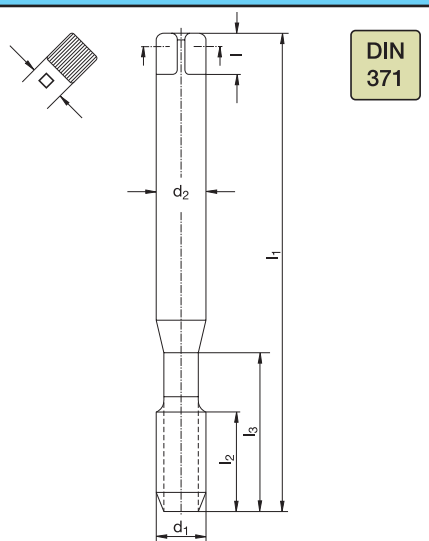


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|---|--|--|---|--|-----------------------------|--|---|-----------|----------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----|---|-----------|----------|
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | |
| | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ | z | Ø [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ | z | Ø [mm] | Code |
| M 3 | 0,5 | 112 | 5 | 3,5 | 6 | 2,7 | 3 | 2,5 | 061 100 | M 8 | 1,25 | 180 | 13 | 6 | 8 | 4,9 | 3 | 6,8 | 061 105 |
| M 4 | 0,7 | 126 | 7 | 4,5 | 6 | 3,4 | 3 | 3,3 | 061 102 | M 10 | 1,5 | 200 | 15 | 7 | 8 | 5,5 | 3 | 8,5 | 061 106 |
| M 5 | 0,8 | 140 | 8 | 6 | 8 | 4,9 | 3 | 4,2 | 061 103 | M 12 | 1,75 | 220 | 18 | 9 | 10 | 7 | 3 | 10,2 | 061 107 |
| M 6 | 1 | 160 | 10 | 6 | 8 | 4,9 | 3 | 5 | 061 104 | M 14 | 2 | 220 | 20 | 11 | 12 | 9 | 3 | 12 | 061 108 |
| | | | | | | | | | | M 16 | 2 | 220 | 20 | 12 | 12 | 9 | 3 | 14 | 061 109 |
| | | | | | | | | | | M 20 | 2,5 | 280 | 25 | 16 | 15 | 12 | 4 | 17,5 | 061 111 |

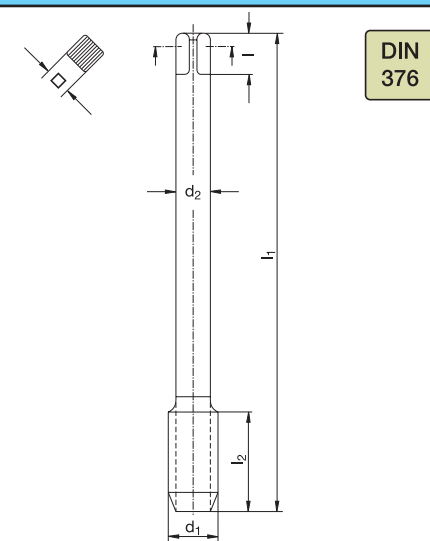




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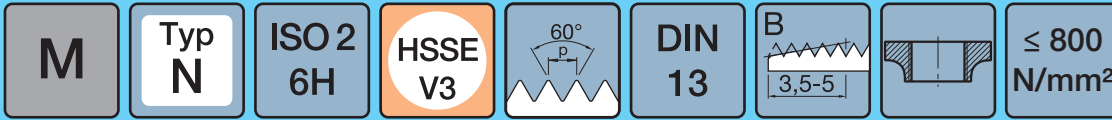
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DIN 376



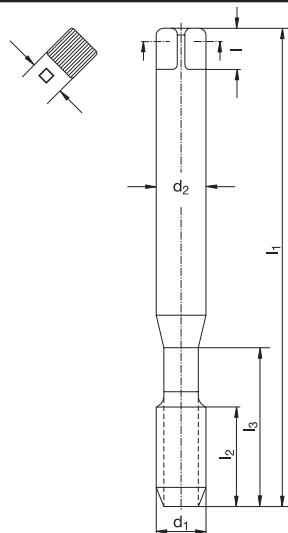
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|--|--|------------------------|---------------------------------|------------------------|--|--|-----------|---------------------------------|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | | 1.1-1.3 | | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | | 1.1-1.3 | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 060 163 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 060 175 |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 2 | 2,5 | 060 168 | M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 3 | 12 | 060 176 |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 2 | 3,3 | 060 170 | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 060 177 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 2 | 4,2 | 060 171 | | | | | | | | | | |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 060 172 | | | | | | | | | | |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 060 173 | | | | | | | | | | |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 060 174 | | | | | | | | | | |



| | | | M HSSE-V3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|---|--------------------------------|----------------|----------------|----------------|------|---|------|---------|------|------|------|------|------|------|------|------|------|--|------|--|------------|-----|----|---|---|-----|---|-----|---|-----|---------|------------|-----|----|----|----|-----|---|-----|---|-----|---------|------------|-----|----|----|----|-----|---|-----|---|-----|---------|------------|-----|----|----|----|---|---|-----|---|-----|---------|------------|---|----|----|----|---|---|-----|---|---|---------|------------|------|----|----|----|---|---|-----|---|-----|---------|-------------|-----|-----|----|----|----|----|---|---|-----|---------|--|--|--|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DIN 371 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 905 104 ¹²⁰ Ni-OX | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>d₁</th> <th>P</th> <th>l₁</th> <th>l₂</th> <th>l₃</th> <th>d₂</th> <th>l</th> <th>□</th> <th>z</th> <th>∅</th> <th>Code</th> </tr> <tr> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th></th> <th>[mm]</th> <th></th> </tr> </thead> <tbody> <tr> <td>M 2</td> <td>0,4</td> <td>45</td> <td>8</td> <td>-</td> <td>2,8</td> <td>5</td> <td>2,1</td> <td>2</td> <td>1,6</td> <td>061 900</td> </tr> <tr> <td>M 3</td> <td>0,5</td> <td>56</td> <td>11</td> <td>18</td> <td>3,5</td> <td>6</td> <td>2,7</td> <td>2</td> <td>2,5</td> <td>061 905</td> </tr> <tr> <td>M 4</td> <td>0,7</td> <td>63</td> <td>13</td> <td>21</td> <td>4,5</td> <td>6</td> <td>3,4</td> <td>2</td> <td>3,3</td> <td>061 907</td> </tr> <tr> <td>M 5</td> <td>0,8</td> <td>70</td> <td>16</td> <td>25</td> <td>6</td> <td>8</td> <td>4,9</td> <td>2</td> <td>4,2</td> <td>061 908</td> </tr> <tr> <td>M 6</td> <td>1</td> <td>80</td> <td>19</td> <td>30</td> <td>6</td> <td>8</td> <td>4,9</td> <td>3</td> <td>5</td> <td>061 909</td> </tr> <tr> <td>M 8</td> <td>1,25</td> <td>90</td> <td>22</td> <td>35</td> <td>8</td> <td>9</td> <td>6,2</td> <td>3</td> <td>6,8</td> <td>061 910</td> </tr> <tr> <td>M 10</td> <td>1,5</td> <td>100</td> <td>24</td> <td>39</td> <td>10</td> <td>11</td> <td>8</td> <td>3</td> <td>8,5</td> <td>061 911</td> </tr> </tbody> </table> | d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | ∅ | Code | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | | M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 061 900 | M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 2 | 2,5 | 061 905 | M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 2 | 3,3 | 061 907 | M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 2 | 4,2 | 061 908 | M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 061 909 | M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 061 910 | M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 061 911 | | | |
| d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | ∅ | Code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 061 900 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 2 | 2,5 | 061 905 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 2 | 3,3 | 061 907 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 2 | 4,2 | 061 908 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 061 909 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 061 910 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 061 911 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



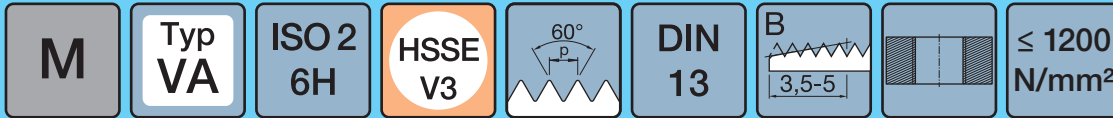
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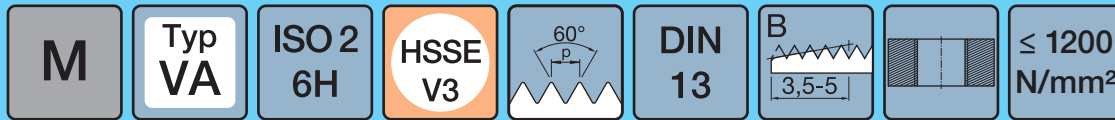


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| Catalogue n° ^{W%} | Nr. di catalogo ^{W%} | VA-OX |
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| l₂ [mm] | l₃ [mm] | d₂ [mm] |
| l [mm] | □ [mm] | z [mm] |
| ∅ [mm] | Code | |
| M 3 | 0,5 | 56 |
| M 4 | 0,7 | 63 |
| M 5 | 0,8 | 70 |
| M 6 | 1 | 80 |
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| M 8 | 1,25 | 90 |



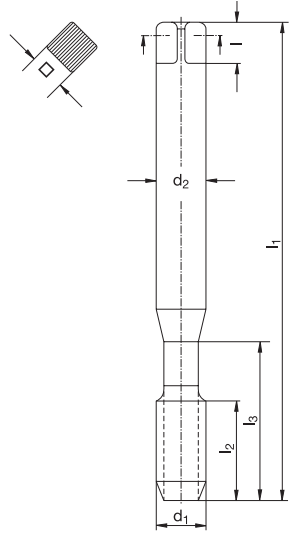
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| Werkstoffgruppen Groupes de matières | | | | | | | | | | | Werkstoffgruppen Groupes de matières | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | | | | | | | | | Classification of work materials Gruppo materiali | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 030 001 | M 3 | 0,5 | 56 | 11 | 2,2 | - | - | 3 | 2,5 | 030 045 | |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 030 004 | M 4 | 0,7 | 63 | 13 | 2,8 | 5 | 2,1 | 3 | 3,3 | 030 047 | |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 006 | M 5 | 0,8 | 70 | 16 | 3,5 | 6 | 2,7 | 3 | 4,2 | 030 048 | |
| M 3,5 | 0,6 | 56 | 12 | 20 | 4 | 6 | 3 | 3 | 2,9 | 030 007 | M 6 | 1 | 80 | 19 | 4,5 | 6 | 3,4 | 3 | 5 | 030 049 | |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 008 | M 8 | 1,25 | 90 | 22 | 6 | 8 | 4,9 | 3 | 6,8 | 030 050 | |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 030 009 | M 10 | 1,5 | 100 | 24 | 7 | 8 | 5,5 | 3 | 8,5 | 030 051 | |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 030 010 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 030 013 | |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 030 011 | M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 3 | 12 | 030 014 | |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 030 012 | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 030 015 | |
| M 12 | 1,75 | 110 | 28 | 45 | 12 | 12 | 9 | 3 | 10,2 | 030 000 | M 18 | 2,5 | 125 | 34 | 14 | 14 | 11 | 3 | 15,5 | 030 016 | |
| | | | | | | | | | | | M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | 030 017 | |
| | | | | | | | | | | | M 22 | 2,5 | 140 | 34 | 18 | 17 | 14,5 | 3 | 19,5 | 030 018 | |
| | | | | | | | | | | | M 24 | 3 | 160 | 38 | 18 | 17 | 14,5 | 3 | 21 | 030 020 | |
| | | | | | | | | | | | M 27 | 3 | 160 | 38 | 20 | 19 | 16 | 4 | 24 | 030 021 | |
| | | | | | | | | | | | M 30 | 3,5 | 180 | 45 | 22 | 21 | 18 | 4 | 26,5 | 030 022 | |
| | | | | | | | | | | | M 33 | 3,5 | 180 | 50 | 25 | 23 | 20 | 4 | 29,5 | 030 023 | |
| | | | | | | | | | | | M 36 | 4 | 200 | 56 | 28 | 25 | 22 | 4 | 32 | 030 024 | |



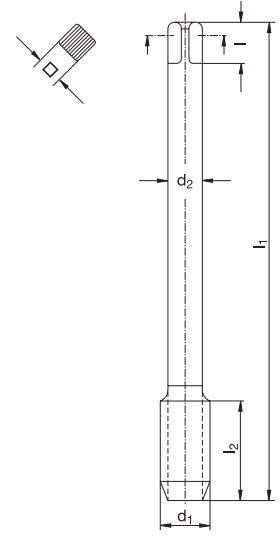


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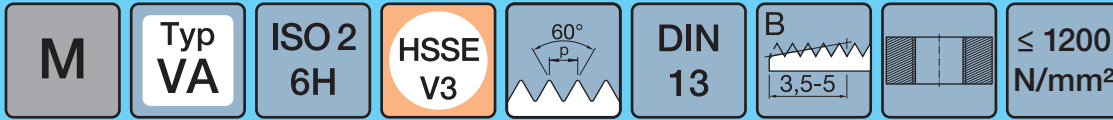
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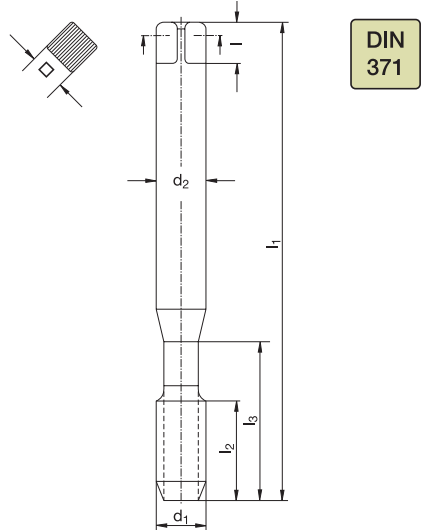
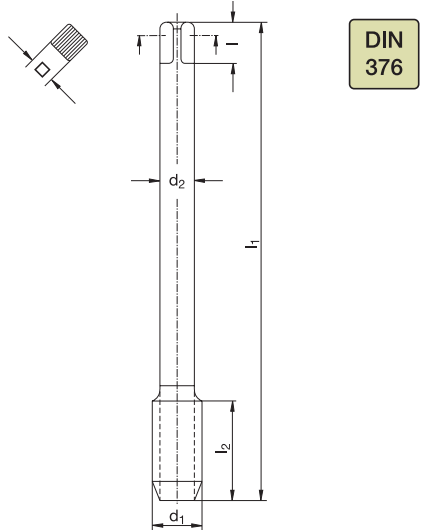



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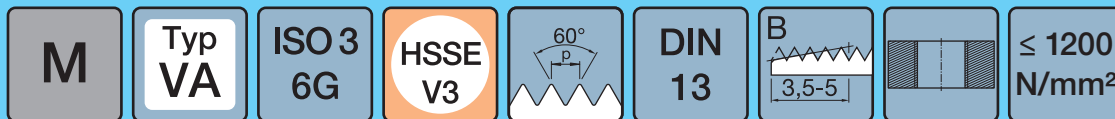


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|---|--|----------------------------------|---|--|----------------------------------|-----------|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|
| Werkstoffgruppen Groupes de matières | | 1; 6.1; 6.2 | Werkstoffgruppen Groupes de matières | | 1; 6.1; 6.2 | | | | | | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 930 006 | M 4 | 0,7 | 63 | 13 | 2,8 | 5 | 2,1 | 3 | 3,3 | 930 047 |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 930 008 | M 5 | 0,8 | 70 | 16 | 3,5 | 6 | 2,7 | 3 | 4,2 | 930 048 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 930 009 | M 6 | 1 | 80 | 19 | 4,5 | 6 | 3,4 | 3 | 5 | 930 049 |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 930 010 | M 8 | 1,25 | 90 | 22 | 6 | 8 | 4,9 | 3 | 6,8 | 930 050 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 930 011 | M 10 | 1,5 | 100 | 24 | 7 | 8 | 5,5 | 3 | 8,5 | 930 051 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 930 012 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 930 013 |
| | | | | | | | | | | | M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 3 | 12 | 930 014 |
| | | | | | | | | | | | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 930 015 |
| | | | | | | | | | | | M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | 930 017 |
| | | | | | | | | | | | M 22 | 2,5 | 140 | 34 | 18 | 17 | 14,5 | 3 | 19,5 | 930 018 |
| | | | | | | | | | | | M 24 | 3 | 160 | 38 | 18 | 17 | 14,5 | 3 | 21 | 930 020 |
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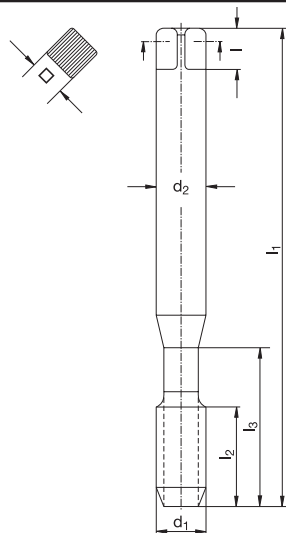
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|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|------------------------------|--|--|--|--|--|--|--|--|--|--|------------------|--|--|--|--|--|--|--|--|--|--|------------------|--|--|--|--|--|--|--|--|--|--|----------|--|--|--|--|--|--|--|--|--|--|------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|---------|--|--|--|--|--|--|--|--|--|--|
| DIN 371 | | | | | | | | | | | DIN 376 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | | 371 143⁴³⁰ VA-TiCN | | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | | 376 143⁴³⁰ VA-TiCN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | | 1; 2; 3.1; 3.3; 3.4; 4; 5.1; 5.2; 6.1; 6.2; 7 | | | | | | | | | | | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | | 1; 2; 3.1; 3.3; 3.4; 4; 5.1; 5.2; 6.1; 6.2; 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| d₁ [mm] | | | | | | | | | | | P [mm] | | | | | | | | | | | l₁ [mm] | | | | | | | | | | | l₂ [mm] | | | | | | | | | | | d₂ [mm] | | | | | | | | | | | l [mm] | | | | | | | | | | | □ [mm] | | | | | | | | | | | z | | | | | | | | | | | ∅ [mm] | | | | | | | | | | | Code  | | | | | | | | | | | | | | | | | | | | | |
| M 3 | | | | | | | | | | | 0,5 | | | | | | | | | | | 56 | | | | | | | | | | | 11 | | | | | | | | | | | 18 | | | | | | | | | | | 3,5 | | | | | | | | | | | 6 | | | | | | | | | | | 2,7 | | | | | | | | | | | 3 | | | | | | | | | | | 2,5 | | | | | | | | | | | 430 006 | | | | | | | | | | |
| M 4 | | | | | | | | | | | 0,7 | | | | | | | | | | | 63 | | | | | | | | | | | 13 | | | | | | | | | | | 21 | | | | | | | | | | | 4,5 | | | | | | | | | | | 6 | | | | | | | | | | | 3,4 | | | | | | | | | | | 3 | | | | | | | | | | | 3,3 | | | | | | | | | | | 430 008 | | | | | | | | | | |
| M 5 | | | | | | | | | | | 0,8 | | | | | | | | | | | 70 | | | | | | | | | | | 16 | | | | | | | | | | | 25 | | | | | | | | | | | 6 | | | | | | | | | | | 8 | | | | | | | | | | | 4,9 | | | | | | | | | | | 3 | | | | | | | | | | | 4,2 | | | | | | | | | | | 430 009 | | | | | | | | | | |
| M 6 | | | | | | | | | | | 1 | | | | | | | | | | | 80 | | | | | | | | | | | 19 | | | | | | | | | | | 30 | | | | | | | | | | | 6 | | | | | | | | | | | 8 | | | | | | | | | | | 4,9 | | | | | | | | | | | 3 | | | | | | | | | | | 5 | | | | | | | | | | | 430 010 | | | | | | | | | | |
| M 8 | | | | | | | | | | | 1,25 | | | | | | | | | | | 90 | | | | | | | | | | | 22 | | | | | | | | | | | 35 | | | | | | | | | | | 8 | | | | | | | | | | | 9 | | | | | | | | | | | 6,2 | | | | | | | | | | | 3 | | | | | | | | | | | 6,8 | | | | | | | | | | | 430 011 | | | | | | | | | | |
| M 10 | | | | | | | | | | | 1,5 | | | | | | | | | | | 100 | | | | | | | | | | | 24 | | | | | | | | | | | 39 | | | | | | | | | | | 10 | | | | | | | | | | | 11 | | | | | | | | | | | 8 | | | | | | | | | | | 3 | | | | | | | | | | | 8,5 | | | | | | | | | | | 430 012 | | | | | | | | | | |
| M 12 | | | | | | | | | | | 1,75 | | | | | | | | | | | 110 | | | | | | | | | | | 28 | | | | | | | | | | | 9 | | | | | | | | | | | 10 | | | | | | | | | | | 7 | | | | | | | | | | | 3 | | | | | | | | | | | 10,2 | | | | | | | | | | | 430 013 | | | | | | | | | | | | | | | | | | | | | |
| M 16 | | | | | | | | | | | 2 | | | | | | | | | | | 110 | | | | | | | | | | | 32 | | | | | | | | | | | 12 | | | | | | | | | | | 12 | | | | | | | | | | | 9 | | | | | | | | | | | 3 | | | | | | | | | | | 14 | | | | | | | | | | | 430 015 | | | | | | | | | | | | | | | | | | | | | |
| M 20 | | | | | | | | | | | 2,5 | | | | | | | | | | | 140 | | | | | | | | | | | 34 | | | | | | | | | | | 16 | | | | | | | | | | | 15 | | | | | | | | | | | 12 | | | | | | | | | | | 3 | | | | | | | | | | | 17,5 | | | | | | | | | | | 430 017 | | | | | | | | | | | | | | | | | | | | | |
| M 22 | | | | | | | | | | | 2,5 | | | | | | | | | | | 140 | | | | | | | | | | | 34 | | | | | | | | | | | 18 | | | | | | | | | | | 17 | | | | | | | | | | | 14,5 | | | | | | | | | | | 3 | | | | | | | | | | | 19,5 | | | | | | | | | | | 430 018 | | | | | | | | | | | | | | | | | | | | | |
| M 24 | | | | | | | | | | | 3 | | | | | | | | | | | 160 | | | | | | | | | | | 38 | | | | | | | | | | | 18 | | | | | | | | | | | 17 | | | | | | | | | | | 14,5 | | | | | | | | | | | 3 | | | | | | | | | | | 21 | | | | | | | | | | | 430 020 | | | | | | | | | | | | | | | | | | | | | |
| M 27 | | | | | | | | | | | 3 | | | | | | | | | | | 160 | | | | | | | | | | | 38 | | | | | | | | | | | 20 | | | | | | | | | | | 19 | | | | | | | | | | | 16 | | | | | | | | | | | 4 | | | | | | | | | | | 24 | | | | | | | | | | | 430 021 | | | | | | | | | | | | | | | | | | | | | |
| M 30 | | | | | | | | | | | 3,5 | | | | | | | | | | | 180 | | | | | | | | | | | 45 | | | | | | | | | | | 22 | | | | | | | | | | | 21 | | | | | | | | | | | 18 | | | | | | | | | | | 4 | | | | | | | | | | | 26,5 | | | | | | | | | | | 430 022 | | | | | | | | | | | | | | | | | | | | | |
| M 33 | | | | | | | | | | | 3,5 | | | | | | | | | | | 180 | | | | | | | | | | | 50 | | | | | | | | | | | 25 | | | | | | | | | | | 23 | | | | | | | | | | | 20 | | | | | | | | | | | 4 | | | | | | | | | | | 29,5 | | | | | | | | | | | 430 023 | | | | | | | | | | | | | | | | | | | | | |
| M 36 | | | | | | | | | | | 4 | | | | | | | | | | | 200 | | | | | | | | | | | 56 | | | | | | | | | | | 28 | | | | | | | | | | | 25 | | | | | | | | | | | 22 | | | | | | | | | | | 4 | | | | | | | | | | | 32 | | | | | | | | | | | 430 024 | | | | | | | | | | | | | | | | | | | | | |



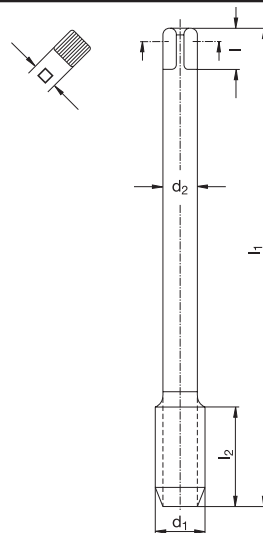


M

HSSE-
V3



DIN
371



DIN
376



Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}

Nr. di catalogo ^{W%}

371 163¹³⁰
VA-OX

Katalog-Nr. ^{W%}
Catalogue n^o ^{W%}

Catalogue no. ^{W%}
Nr. di catalogo ^{W%}

376 163¹³⁰
VA-OX

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1; 2; 4.4; 4.5; 5.1;
5.2; 6.1; 6.2; 7.2;
7.3

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1; 2; 4.4; 4.5; 5.1;
5.2; 6.1; 6.2; 7.2;
7.3

d₁ P l₁ l₂ l₃ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

Code

d₁ P l₁ l₂ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

Code

| | | | | | | | | | | |
|-------|------|-----|----|----|-----|----|-----|---|------|---------|
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 030 340 |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 030 343 |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 345 |
| M 3,5 | 0,6 | 56 | 12 | 20 | 4 | 6 | 3 | 3 | 2,9 | 030 346 |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 347 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 030 348 |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 030 349 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 030 350 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 030 351 |

| | | | | | | | | | |
|------|------|-----|----|----|----|----|---|------|---------|
| M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 030 355 |
| M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 3 | 12 | 030 356 |
| M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 030 357 |
| M 18 | 2,5 | 125 | 34 | 14 | 14 | 11 | 3 | 15,5 | 030 358 |
| M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | 030 359 |

M Typ VA ISO 3 6G HSSE V3 60° DIN 13 B 3,5-5 ≤ 1200 N/mm²

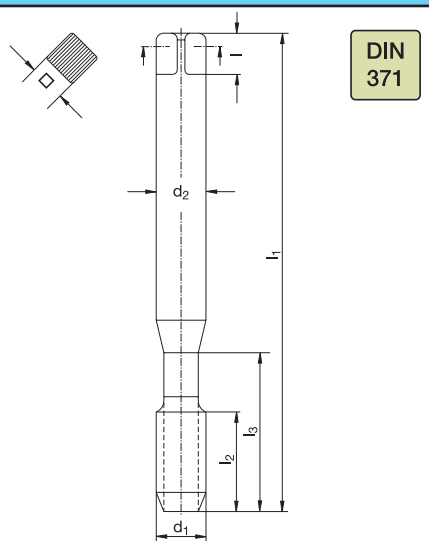
| DIN 371 | | DIN 376 | | | | | | | | |
|---|--|---|--|------------------------|-----------|-----------|-----|-----------|------|---------|
| Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | | | | | |
| VA-TiCN | | VA-TiCN | | | | | | | | |
| Werkstoffgruppen Gruppo materiali | | Werkstoffgruppen Gruppo materiali | | | | | | | | |
| Classification of work materials | | Classification of work materials | | | | | | | | |
| Gruppo materiali | | Gruppo materiali | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 430 340 |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 430 345 |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 430 347 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 430 348 |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 430 349 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 430 350 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 430 351 |
| M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | | 430 355 |
| M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | | 430 357 |
| M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | | 430 359 |

M
HSSE-V3

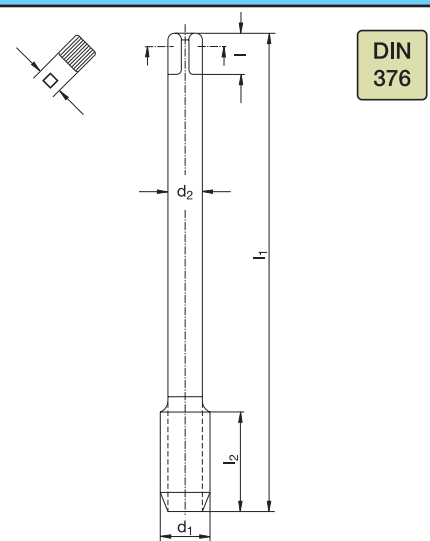




M
HSSE-
V3



DIN 371



DIN 376



| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo W% | | 371 105 ¹³⁰ VA-AZ | | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo W% | | 376 105 ¹³⁰ VA-AZ | | | | | | | | | | | | |
|--|--|------------------------|--|------------------------|--|--|-----------|--|-----------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|----|-----------|------|---------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | | 1; 3.1; 3.3; 3.4; 4.1-4.3; 5.1; 5.2; 6.1; 6.2; 7 | | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | | 1; 3.1; 3.3; 3.4; 4.1-4.3; 5.1; 5.2; 6.1; 6.2; 7 | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 030 060 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 030 072 |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 030 063 | M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 3 | 12 | 030 073 |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 065 | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 030 074 |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 067 | M 18 | 2,5 | 125 | 34 | 14 | 14 | 11 | 3 | 15,5 | 030 075 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 030 068 | M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | 030 076 |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 030 069 | | | | | | | | | | |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 030 070 | | | | | | | | | | |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 030 071 | | | | | | | | | | |

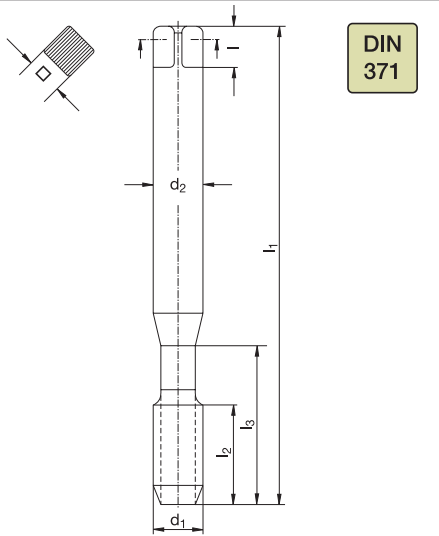
M Typ VA ISO 2 6H HSSE V3 60° P DIN 13 C 2-3 ≤ 1,5xd ≤ 1200 N/mm²

| DIN 371 | | | | | | | | | | | DIN 376 | | | | | | | | | | |
|--|-----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | | | | | | | Werkstoffgruppen Groupes de matières | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | | | | | | | | | Classification of work materials Gruppo materiali | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 3 | 1,6 | 030 280 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 4 | 10,2 | 030 292 | |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 3 | 2,05 | 030 283 | M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 4 | 12 | 030 293 | |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 285 | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 4 | 14 | 030 294 | |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 287 | M 18 | 2,5 | 125 | 34 | 14 | 14 | 11 | 4 | 15,5 | 030 295 | |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 030 288 | M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 4 | 17,5 | 030 296 | |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 030 289 | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 4 | 6,8 | 030 290 | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 4 | 8,5 | 030 291 | | | | | | | | | | | |

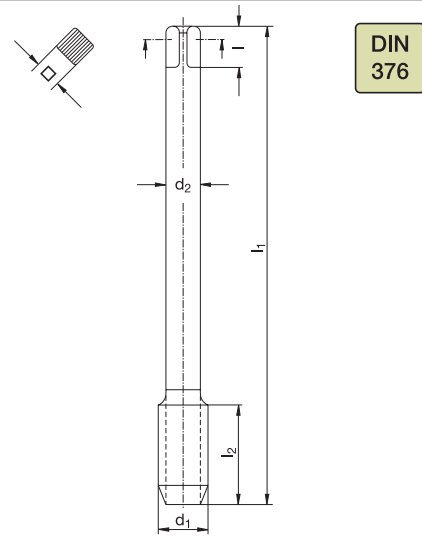
M
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HSSE-
V3



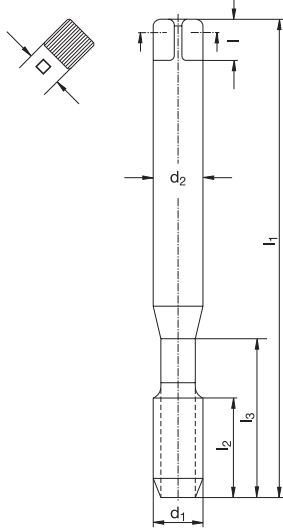
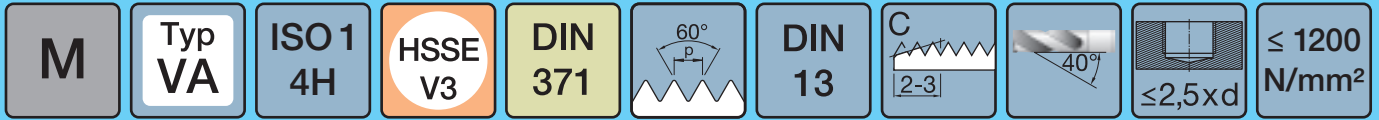
DIN 371



DIN 376



| Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 371 153 ¹³⁰ VA-OX | Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 376 153 ¹³⁰ VA-OX | | | | | | | | | | | | | | | |
|---|--|--|---|--|--|-----------|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|
| Werkstoffgruppen Groupes de matières | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | Werkstoffgruppen Groupes de matières | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | | | | | | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 110 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 3 | 10,2 | 030 117 |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 112 | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 3 | 12 | 030 118 |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 030 113 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 3 | 14 | 030 119 |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 030 114 | M 18 | 2,5 | 125 | 25 | 14 | 14 | 11 | 4 | 15,5 | 030 120 |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 030 115 | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 030 121 |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 030 116 | M 22 | 2,5 | 140 | 25 | 18 | 17 | 14,5 | 4 | 19,5 | 030 122 |
| | | | | | | | | | | | M 24 | 3 | 160 | 30 | 18 | 17 | 14,5 | 4 | 21 | 030 123 |
| | | | | | | | | | | | M 27 | 3 | 160 | 30 | 20 | 19 | 16 | 4 | 24 | 030 124 |
| | | | | | | | | | | | M 30 | 3,5 | 180 | 35 | 22 | 21 | 18 | 4 | 26,5 | 030 125 |
| | | | | | | | | | | | M 33 | 3,5 | 180 | 35 | 25 | 23 | 20 | 4 | 29,5 | 030 126 |
| | | | | | | | | | | | M 36 | 4 | 200 | 40 | 28 | 25 | 22 | 4 | 32 | 030 127 |



M

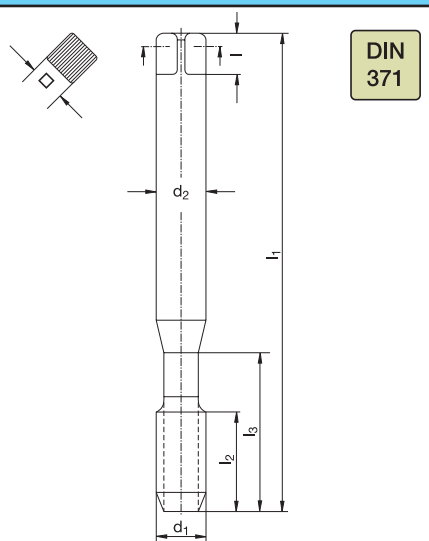
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V3



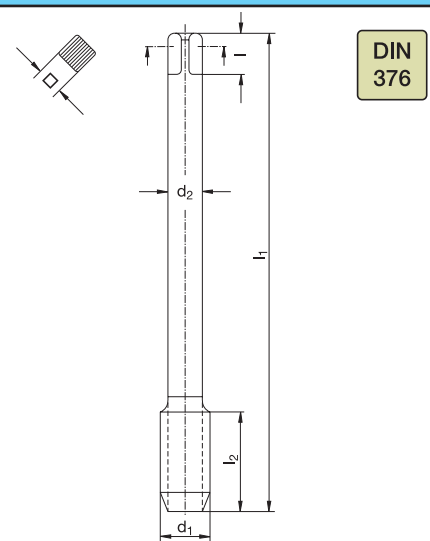
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|---|--|--|
| Katalog-Nr. ^{W%} | Catalogue no. ^{W%} | 371 803 ¹³⁰ |
| Catalogue n° ^{W%} | Nr. di catalogo ^{W%} | VA-OX |
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 |
| d₁ [mm] | P [mm] | l₁ [mm] |
| l₂ [mm] | l₃ [mm] | d₂ [mm] |
| l [mm] | □ [mm] | z |
| ∅ [mm] | Code | |
| M 3 | 0,5 | 56 |
| | 5 | 18 |
| | 3,5 | 6 |
| | 2,7 | 3 |
| | 2,5 | |
| M 4 | 0,7 | 63 |
| | 7 | 21 |
| | 4,5 | 6 |
| | 3,4 | 3 |
| | 3,3 | |
| M 5 | 0,8 | 70 |
| | 8 | 25 |
| | 6 | 8 |
| | 4,9 | 3 |
| | 4,2 | |
| M 6 | 1 | 80 |
| | 10 | 30 |
| | 6 | 8 |
| | 4,9 | 3 |
| | 5 | |
| M 7 | 1 | 80 |
| | 11 | 30 |
| | 7 | 8 |
| | 5,5 | 3 |
| | 6 | |
| M 8 | 1,25 | 90 |
| | 13 | 35 |
| | 8 | 9 |
| | 6,2 | 3 |
| | 6,8 | |



M
HSSE-
V3



DIN 371



DIN 376



| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 371 303 ¹³⁰ | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 376 303 ¹³⁰ | | | | | | | | | | | | | | |
|--|------|--|----|---|-----|--|-----|---|------|---------|------|------|-----|----|-----|----|------|---|------|---------|
| Catalogue n ^o ^{W%} | | VA-OX | | Catalogue n ^o ^{W%} | | VA-OX | | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | |
| d ₁ P l ₁ l ₂ l ₃ d ₂ l □ z Ø | | Code | | d ₁ P l ₁ l ₂ d ₂ l □ z Ø | | Code | | | | | | | | | | | | | | |
| [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | | | | | | | | | | | | | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 030 140 | M 3 | 0,5 | 56 | 5 | 2,2 | - | - | 3 | 2,5 | 030 160 |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 030 142 | M 4 | 0,7 | 63 | 7 | 2,8 | 5 | 2,1 | 3 | 3,3 | 030 162 |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 143 | M 5 | 0,8 | 70 | 8 | 3,5 | 6 | 2,7 | 3 | 4,2 | 030 163 |
| M 3,5 | 0,6 | 56 | 6 | 20 | 4 | 6 | 3 | 3 | 2,9 | 030 144 | M 6 | 1 | 80 | 10 | 4,5 | 6 | 3,4 | 3 | 5 | 030 164 |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 145 | M 8 | 1,25 | 90 | 13 | 6 | 8 | 4,9 | 3 | 6,8 | 030 165 |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 030 146 | M 10 | 1,5 | 100 | 15 | 7 | 8 | 5,5 | 3 | 8,5 | 030 166 |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 030 147 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 4 | 10,2 | 030 150 |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 030 148 | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 4 | 12 | 030 151 |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 030 149 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 4 | 14 | 030 152 |
| M 12 | 1,75 | 110 | 18 | 45 | 12 | 12 | 9 | 4 | 10,2 | 030 138 | M 18 | 2,5 | 125 | 25 | 14 | 14 | 11 | 4 | 15,5 | 030 153 |
| | | | | | | | | | | | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 030 154 |
| | | | | | | | | | | | M 22 | 2,5 | 140 | 25 | 18 | 17 | 14,5 | 4 | 19,5 | 030 155 |
| | | | | | | | | | | | M 24 | 3 | 160 | 30 | 18 | 17 | 14,5 | 4 | 21 | 030 156 |
| | | | | | | | | | | | M 27 | 3 | 160 | 30 | 20 | 19 | 16 | 4 | 24 | 030 157 |
| | | | | | | | | | | | M 30 | 3,5 | 180 | 35 | 22 | 21 | 18 | 5 | 26,5 | 030 158 |
| | | | | | | | | | | | M 33 | 3,5 | 180 | 35 | 25 | 23 | 20 | 5 | 29,5 | 030 159 |
| | | | | | | | | | | | M 36 | 4 | 200 | 40 | 28 | 25 | 22 | 5 | 32 | 030 139 |

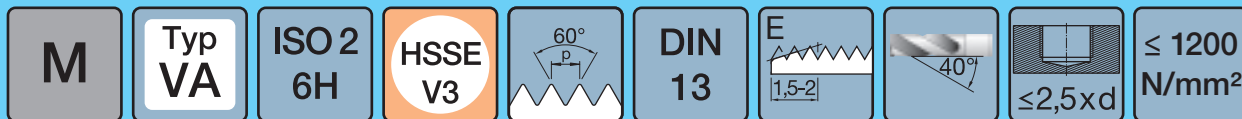
| | | | | | | | | | | |
|---|-----------|----|-------------|------------|----------|-----------|----------|-----|--------|-----------------------------|
| M | Typ VA | AG | ISO 2 6H | HSSE V3 | 60° P | DIN 13 | C 2-3 | 40° | ≤2,5xd | ≤ 1200 N/mm ² |
|---|-----------|----|-------------|------------|----------|-----------|----------|-----|--------|-----------------------------|

| DIN 371 | | | | | | | | | | DIN 376 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|------|----------------|----------------|----------------|--|------|------|---|------|--|------|----------------|----------------|----------------|--|------|---|------|----------------|---------|----------------|----------------|----------------|------|------|----|------|----------------|------|----------------|----------------|----------------|------|------|----|------|---|---|----|---------|------|-----|-----|----|----|----|----|---|------|---------|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 371 313 ¹³⁰ | | | | | 371 313 ¹³⁰ | | | | | 376 313 ¹³⁰ | | | | | 376 313 ¹³⁰ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| VA-OX | | | | | VA-OX | | | | | VA-OX | | | | | VA-OX | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | | | | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | | | | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | | | | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Code | | | | | Code | | | | | Code | | | | | Code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | ∅ | d ₁ | P | l ₁ | l ₂ | d ₂ | l | □ | z | ∅ | d ₁ | P | l ₁ | l ₂ | d ₂ | l | □ | z | ∅ | d ₁ | P | l ₁ | l ₂ | d ₂ | l | □ | z | ∅ | | | | | | | | | | | | | | |
| [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | | | | | | | | | | | | | | |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 400 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 4 | 10,2 | 030 409 | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 4 | 12 | 030 410 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 4 | 14 | 030 411 | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 030 413 |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 402 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 030 403 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 030 404 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 030 406 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 030 408 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

M

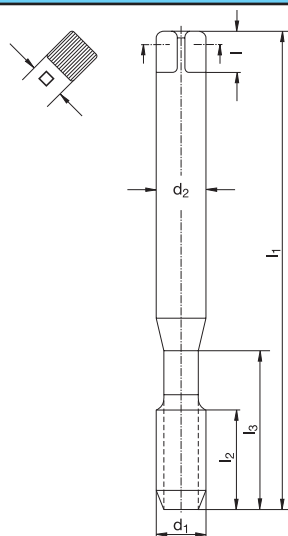
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V3



DIN
371



DIN
376



Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}

Nr. di catalogo ^{W%}

371 323¹³⁰
VA-OX

Katalog-Nr. ^{W%}
Catalogue n^o ^{W%}

Catalogue no. ^{W%}
Nr. di catalogo ^{W%}

376 323¹³⁰
VA-OX

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1; 2; 4.4; 4.5; 5.1;
5.2; 6.1; 6.2; 7.2;
7.3

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1; 2; 4.4; 4.5; 5.1;
5.2; 6.1; 6.2; 7.2;
7.3

d₁ P l₁ l₂ l₃ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

Code

d₁ P l₁ l₂ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

Code

| | | | | | | | | | | |
|-------|------|-----|----|----|-----|----|-----|---|------|---------|
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 030 800 |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 030 801 |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 802 |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 804 |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 030 805 |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 030 806 |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 030 807 |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 030 808 |

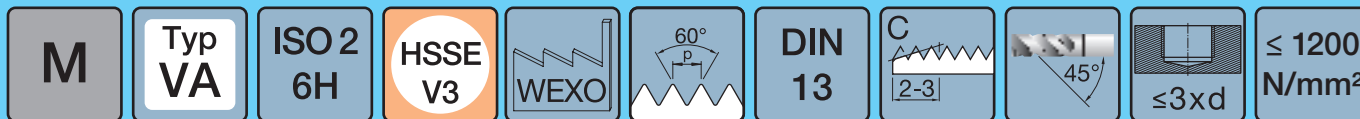
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|------|------|-----|----|----|----|---|---|------|---------|
| M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 4 | 10,2 | 030 810 |
| M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 4 | 12 | 030 811 |
| M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 4 | 14 | 030 812 |

| | | | | | | | | | |
|---|-----------|-------------|------------|----------|-----------|----------|-----|------|-----------------------------|
| M | Typ VA | ISO 2 6H | HSSE V3 | 60° P | DIN 13 | C 2-3 | 45° | ≤3xd | ≤ 1200 N/mm ² |
|---|-----------|-------------|------------|----------|-----------|----------|-----|------|-----------------------------|

| DIN 371 | | | | | | | | | | | DIN 376 | | | | | | | | | | |
|--|-----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|------|---------|--|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|------|---------|--|
| | | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | | | | | | | Werkstoffgruppen Groupes de matières | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | | | | | | | | | Classification of work materials Gruppo materiali | | | | | | | | | | |
| Code | | | | | | | | | | | Code | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ | ∅ | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ | ∅ | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 030 198 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 4 | 10,2 | 030 206 | |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 030 199 | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 4 | 12,0 | 030 207 | |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 200 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 4 | 14,0 | 030 208 | |
| M 3,5 | 0,6 | 56 | 6 | 20 | 4 | 6 | 3 | 3 | 2,9 | 030 217 | M 18 | 2,5 | 125 | 25 | 14 | 14 | 11 | 4 | 15,5 | 030 209 | |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 201 | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 030 210 | |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 030 202 | M 22 | 2,5 | 140 | 25 | 18 | 17 | 14,5 | 4 | 19,5 | 030 211 | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 030 203 | M 24 | 3 | 160 | 30 | 18 | 17 | 14,5 | 4 | 21,0 | 030 212 | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 030 204 | M 27 | 3 | 160 | 30 | 20 | 19 | 16 | 4 | 24,0 | 030 213 | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 030 205 | M 30 | 3,5 | 180 | 35 | 22 | 21 | 18 | 5 | 26,5 | 030 214 | |
| | | | | | | | | | | | M 33 | 3,5 | 180 | 35 | 25 | 23 | 20 | 5 | 29,5 | 030 215 | |
| | | | | | | | | | | | M 36 | 4 | 200 | 40 | 28 | 25 | 22 | 5 | 32,0 | 030 216 | |

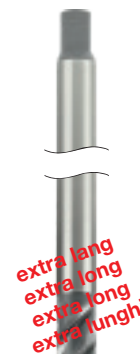
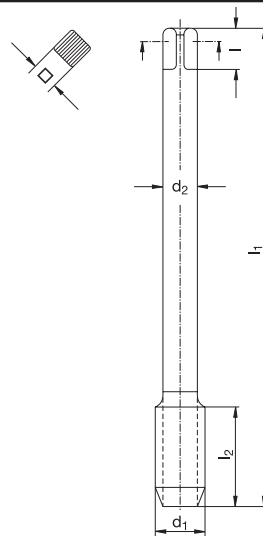
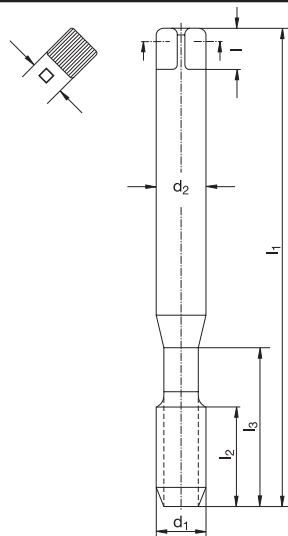
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| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | | | | | | | | 957 053 ¹³⁰ VA-OX | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | | | | | | | | 957 053 ¹³⁰ VA-OX |
|--|--|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|--|--|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|--|--|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | | | | | | | | | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | | | | | | | | | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | | | |
| M 2 | 0,4 | 90 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 030 260 | M 12 | 1,75 | 220 | 18 | 9 | 10 | 7 | 4 | 10,19 | 030 269 | | | |
| M 2,5 | 0,45 | 100 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 030 261 | M 14 | 2 | 220 | 20 | 11 | 12 | 9 | 4 | 12 | 030 270 | | | |
| M 3 | 0,5 | 112 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 262 | M 16 | 2 | 220 | 20 | 12 | 12 | 9 | 4 | 14 | 030 271 | | | |
| M 3,5 | 0,6 | 112 | 6 | 20 | 4 | 6 | 3 | 3 | 2,9 | 030 263 | M 18 | 2,5 | 250 | 25 | 14 | 14 | 11 | 4 | 15,5 | 030 272 | | | |
| M 4 | 0,7 | 126 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 264 | M 20 | 2,5 | 280 | 25 | 16 | 15 | 12 | 4 | 17,5 | 030 273 | | | |
| M 5 | 0,8 | 140 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 030 265 | | | | | | | | | | | | | |
| M 6 | 1 | 160 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 030 266 | | | | | | | | | | | | | |
| M 8 | 1,25 | 180 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 030 267 | | | | | | | | | | | | | |
| M 10 | 1,5 | 200 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 030 268 | | | | | | | | | | | | | |

| | | | | | | | | | |
|---|-----------|-------------|------------|----------|-----------|----------|-----|------|-----------------------------|
| M | Typ VA | ISO 2 6H | HSSE V3 | 60° P | DIN 13 | C 2-3 | 40° | ≤3xd | ≤ 1200 N/mm ² |
|---|-----------|-------------|------------|----------|-----------|----------|-----|------|-----------------------------|

| DIN 371 | | | | | | | | | | | DIN 376 | | | | | | | | | | |
|--|-----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|
| | | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | |
| 371 393 ⁴³⁰ | | | | | | | | | | | 376 393 ⁴³⁰ | | | | | | | | | | |
| VA-TiN | | | | | | | | | | | VA-TiN | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | |
| 1; 6.1; 6.2 | | | | | | | | | | | 1; 6.1; 6.2 | | | | | | | | | | |
| Code | | | | | | | | | | | Code | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | | |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 930 143 | M 3 | 0,5 | 56 | 5 | 2,2 | - | - | 3 | 2,5 | 930 160 | |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 930 145 | M 4 | 0,7 | 63 | 7 | 2,8 | 5 | 2,1 | 3 | 3,3 | 930 162 | |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 930 146 | M 5 | 0,8 | 70 | 8 | 3,5 | 6 | 2,7 | 3 | 4,2 | 930 163 | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 930 147 | M 6 | 1 | 80 | 10 | 4,5 | 6 | 3,4 | 3 | 5 | 930 164 | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 930 148 | M 8 | 1,25 | 90 | 13 | 6 | 8 | 4,9 | 3 | 6,8 | 930 165 | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 930 149 | M 10 | 1,5 | 100 | 15 | 7 | 8 | 5,5 | 3 | 8,5 | 930 166 | |
| | | | | | | | | | | | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 4 | 10,2 | 930 150 | |
| | | | | | | | | | | | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 4 | 14 | 930 152 | |
| | | | | | | | | | | | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 930 154 | |

M

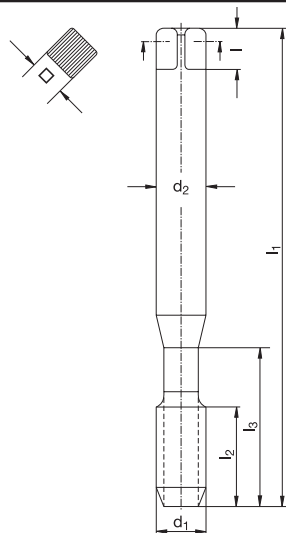
HSSE-V3



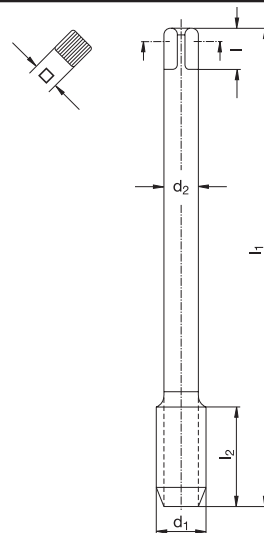


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DIN
371



DIN
376



Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

371 343⁴³⁰
VA-TiCN

Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

376 343¹³⁰
VA-TiCN

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

1; 2; 3.1; 3.3; 3.4;
4; 5.1; 5.2; 6.1;
6.2; 7

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

1; 2; 3.1; 3.3; 3.4;
4; 5.1; 5.2; 6.1;
6.2; 7

d₁ P l₁ l₂ l₃ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

Code

d₁ P l₁ l₂ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

Code

| | | | | | | | | | | |
|------|------|-----|----|----|-----|----|-----|---|-----|---------|
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 430 143 |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 430 145 |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 430 146 |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 430 147 |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 430 148 |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 430 149 |

| | | | | | | | | | |
|------|------|-----|----|----|----|------|---|------|---------|
| M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 4 | 10,2 | 430 150 |
| M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 4 | 14 | 430 152 |
| M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 430 154 |
| M 22 | 2,5 | 140 | 25 | 18 | 17 | 14,5 | 4 | 19,5 | 430 155 |
| M 24 | 3 | 160 | 30 | 18 | 17 | 14,5 | 4 | 21 | 430 156 |
| M 27 | 3 | 160 | 30 | 20 | 19 | 16 | 4 | 24 | 430 157 |
| M 30 | 3,5 | 180 | 35 | 22 | 21 | 18 | 5 | 26,5 | 430 158 |
| M 33 | 3,5 | 180 | 35 | 25 | 23 | 20 | 5 | 29,5 | 430 159 |
| M 36 | 4 | 200 | 40 | 28 | 25 | 22 | 5 | 32 | 430 139 |

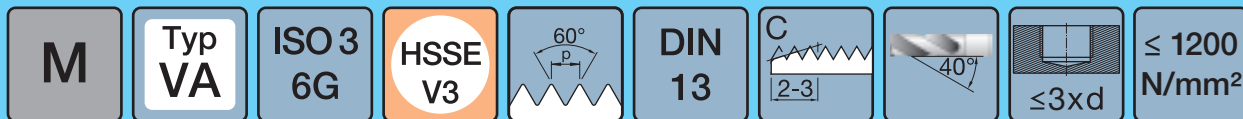
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|---|-----------|-------------|------------|----------|-----------|----------|-----|--------|-----------------------------|
| M | Typ VA | ISO 3 6G | HSSE V3 | 60° P | DIN 13 | C 2-3 | 40° | ≤2,5xd | ≤ 1200 N/mm ² |
|---|-----------|-------------|------------|----------|-----------|----------|-----|--------|-----------------------------|

| DIN 371 | | | | | | | | | | | DIN 376 | | | | | | | | | | |
|--|------|----------------|----------------|----------------|----------------|------|------|---|------|---------|--|------|----------------|----------------|----------------|------|------|---|------|---------|--|
| | | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | | | | | | | Werkstoffgruppen Groupes de matières | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | | | | | | | | | Classification of work materials Gruppo materiali | | | | | | | | | | |
| Code | | | | | | | | | | | Code | | | | | | | | | | |
| d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | ∅ | | d ₁ | P | l ₁ | l ₂ | d ₂ | l | □ | z | ∅ | | |
| [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 030 370 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 4 | 10,2 | 030 385 | |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 030 373 | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 4 | 12 | 030 386 | |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 375 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 4 | 14 | 030 387 | |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 377 | M 18 | 2,5 | 125 | 25 | 14 | 14 | 11 | 4 | 15,5 | 030 388 | |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 030 378 | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 030 389 | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 030 379 | M 24 | 3 | 160 | 30 | 18 | 17 | 14,5 | 4 | 21 | 030 391 | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 030 380 | M 27 | 3 | 160 | 30 | 20 | 19 | 16 | 4 | 24 | 030 392 | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 030 381 | M 30 | 3,5 | 180 | 35 | 22 | 21 | 18 | 5 | 26,5 | 030 393 | |

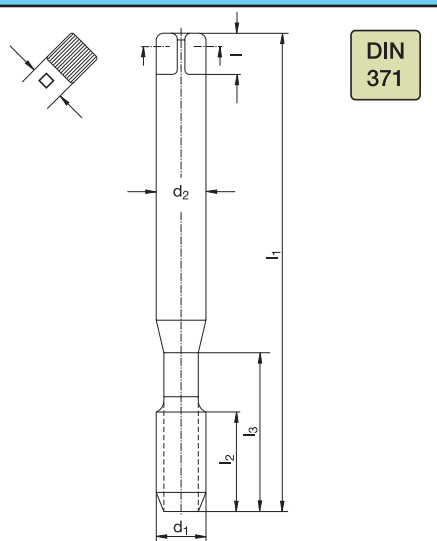
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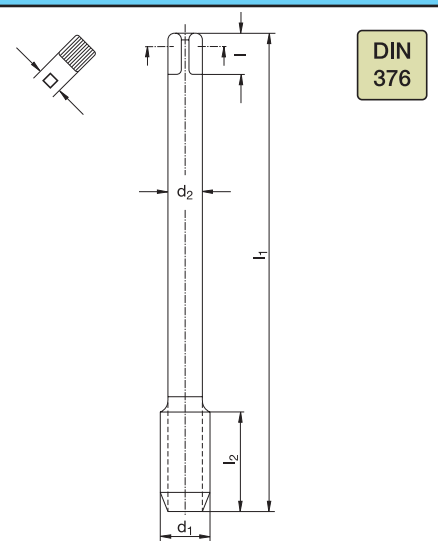




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DIN 371



DIN 376



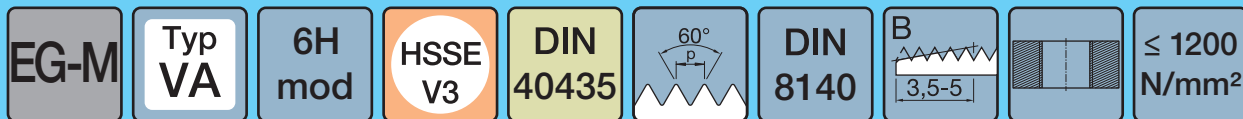
| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 371 364 ⁴³⁰ VA-TiCN | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 376 364 ⁴³⁰ VA-TiCN | | | | | |
|--|--|---|--|--|---|-----------|-----|-----------|---------|---------|
| Werkstoffgruppen Groupes de matières | | 1; 2; 3.1; 3.3; 3.4; 4; 5.1; 5.2; 6.1; 6.2; 7 | Werkstoffgruppen Groupes de matières | | 1; 2; 3.1; 3.3; 3.4; 4; 5.1; 5.2; 6.1; 6.2; 7 | | | | | |
| Classification of work materials Gruppo materiali | | | Classification of work materials Gruppo materiali | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 430 370 |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 430 375 |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 430 377 |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 430 378 |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 430 379 |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 430 380 |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 430 381 |
| M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 4 | 10,2 | 430 385 | |
| M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 4 | 14 | 430 387 | |
| M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 430 389 | |

| | | | | | | | | | | |
|---|-----------|----|-------------|------------|----------|-----------|----------|-----|--------|-----------------------------|
| M | Typ VA | AZ | ISO 2 6H | HSSE V3 | 60° P | DIN 13 | C 2-3 | 40° | ≤2,5xd | ≤ 1200 N/mm ² |
|---|-----------|----|-------------|------------|----------|-----------|----------|-----|--------|-----------------------------|

| DIN 371 | | | | | | | | | | DIN 376 | | | | | | | | | | |
|--|------|-----|----|----|--|----|-----|---|-----|---|------|------|-----|----|--|----|----|---|------|---------|
| | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | |
| Catalogue n ^o ^{W%} | | | | | Catalogue n ^o ^{W%} | | | | | Catalogue n ^o ^{W%} | | | | | Catalogue n ^o ^{W%} | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | |
| d ₁ P l ₁ l ₂ l ₃ d ₂ l □ z Ø | | | | | Code | | | | | d ₁ P l ₁ l ₂ d ₂ l □ z Ø | | | | | Code | | | | | |
| [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | | | | [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | | | | [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | | | | [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | | | | |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 430 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 4 | 10,2 | 030 439 |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 432 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 4 | 14 | 030 441 |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 030 433 | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 030 443 |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 030 434 | | | | | | | | | | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 030 436 | | | | | | | | | | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 030 438 | | | | | | | | | | |

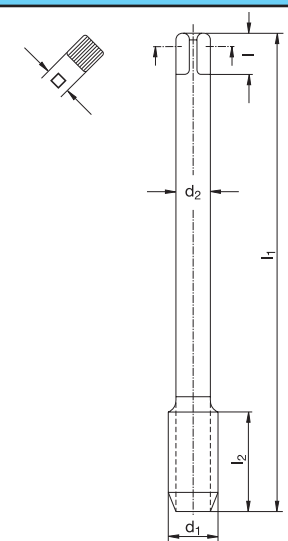
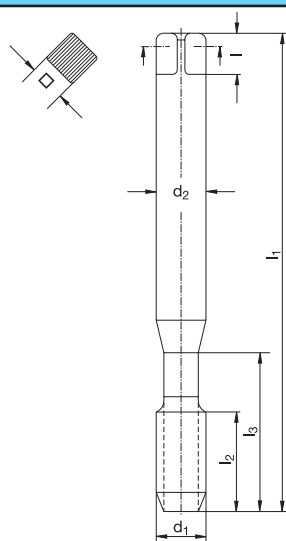
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HSSE-V3



EG-M

HSSE-V3



| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 381 103 ¹³⁰ VA-OX | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 381 103 ¹³⁰ VA-OX | | | | | | | | | | | | | |
|--|--|--|--|--|--|-----------|-----------|----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|-----------|----------|------|---------|
| Werkstoffgruppen Groupes de matières | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | Werkstoffgruppen Groupes de matières | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | | | | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | |
| d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | ∅ [mm] | Code | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | ∅ [mm] | Code | | |
| EG M 2,5 | 3,085 | 56 | 9 | 18 | 3,5 | 6 | 2,7 | 2,65 | 030 601 | EG M 10 | 11,949 | 100 | 21 | 9 | 10 | 7 | 10,5 | 030 608 |
| EG M 3 | 3,650 | 63 | 12 | 21 | 4,5 | 6 | 3,4 | 3,15 | 030 602 | EG M 12 | 14,273 | 110 | 25 | 11 | 12 | 9 | 12,5 | 030 609 |
| EG M 3,5 | 4,279 | 70 | 13 | 25 | 6 | 8 | 4,9 | 3,7 | 030 603 | EG M 14 | 16,598 | 110 | 25 | 12 | 12 | 9 | 14,5 | 030 610 |
| EG M 4 | 4,909 | 70 | 13 | 25 | 6 | 8 | 4,9 | 4,2 | 030 604 | EG M 16 | 18,598 | 125 | 30 | 14 | 14 | 11 | 16,5 | 030 611 |
| EG M 5 | 6,039 | 80 | 15 | 30 | 6 | 8 | 4,9 | 5,25 | 030 605 | | | | | | | | | |
| EG M 6 | 7,299 | 90 | 18 | 35 | 8 | 9 | 6,2 | 6,3 | 030 606 | | | | | | | | | |
| EG M 8 | 9,624 | 100 | 20 | 39 | 10 | 11 | 8 | 8,4 | 030 607 | | | | | | | | | |

| | | | | | | | | | | |
|-------------|------------------|-----------|--------------------|----------------------|----------|---------------------|----------|-----|--------|-----------------------------|
| EG-M | Typ VA | 6H mod | HSSE V3 | DIN 40435 | 60° P | DIN 8140 | C 2-3 | 40° | ≤2,5xd | ≤ 1200 N/mm ² |
|-------------|------------------|-----------|--------------------|----------------------|----------|---------------------|----------|-----|--------|-----------------------------|

| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 381 303 ¹³⁰ | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 381 303 ¹³⁰ | | | | | | | | | | |
|--|-------|--|-------|---|----|--|------|---------|----------------|--------|-----|-------|----|----|------|---------|
| Catalogue n ^o ^{W%} | | VA-OX | | Catalogue n ^o ^{W%} | | VA-OX | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | | | | | | |
| d ₁ l ₁ l ₂ l ₃ d ₂ l □ Ø | | Code | | d ₁ l ₁ l ₂ d ₂ l □ Ø | | Code | | | | | | | | | | |
| [mm] [mm][mm][mm] [mm][mm][mm] [mm] | | ✎ | | [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | ✎ | | | | | | | | | | |
| EG M 2,5 | 3,085 | 56 | 6 18 | 3,5 | 6 | 2,7 | 2,65 | 030 615 | EG M 10 | 11,949 | 100 | 13 9 | 10 | 7 | 10,5 | 030 621 |
| EG M 3 | 3,650 | 63 | 7 21 | 4,5 | 6 | 3,4 | 3,15 | 030 616 | EG M 12 | 14,273 | 110 | 20 11 | 12 | 9 | 12,5 | 030 622 |
| EG M 4 | 4,909 | 70 | 8 25 | 6 | 8 | 4,9 | 4,2 | 030 617 | EG M 14 | 16,598 | 110 | 20 12 | 12 | 9 | 14,5 | 030 623 |
| EG M 5 | 6,039 | 80 | 10 30 | 6 | 8 | 4,9 | 5,25 | 030 618 | EG M 16 | 18,598 | 125 | 25 14 | 14 | 11 | 16,5 | 030 624 |
| EG M 6 | 7,299 | 90 | 12 35 | 8 | 9 | 6,2 | 6,3 | 030 619 | | | | | | | | |
| EG M 8 | 9,624 | 100 | 15 39 | 10 | 11 | 8 | 8,4 | 030 620 | | | | | | | | |

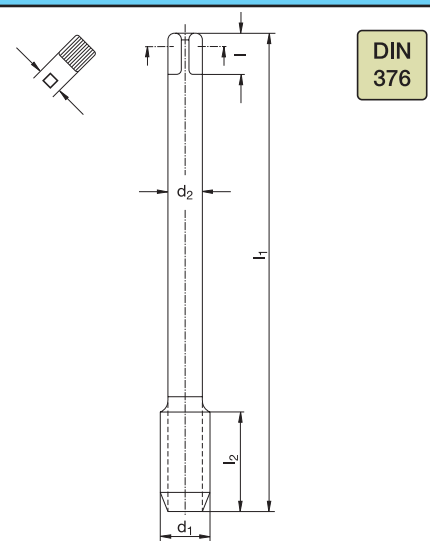
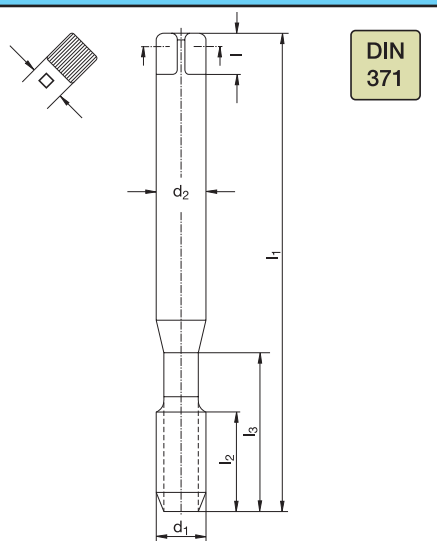
EG-M

HSSE-V3

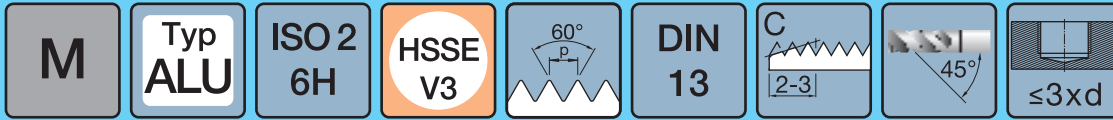




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HSSE-
V3

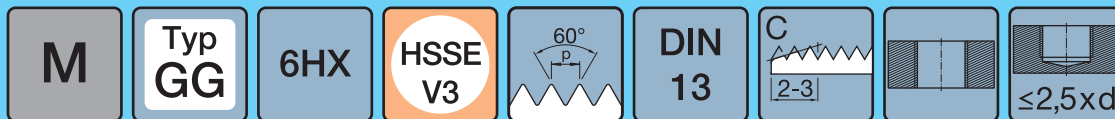


| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 371 140 ¹²⁰ ALU | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 376 140 ¹²⁰ ALU | | | | | | | | | | | | | | | | |
|--|--|-------------------------------|--|--|-------------------------------|-----------|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|
| Werkstoffgruppen Groupes de matières | | 3.1; 3.3; 4.1; 4.2; 7.1 | Werkstoffgruppen Groupes de matières | | 3.1; 3.3; 4.1; 4.2; 7.1 | | | | | | | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 280 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 064 356 | |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 282 | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 064 358 | |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 060 283 | M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | 064 360 | |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 060 284 | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 060 286 | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 060 288 | | | | | | | | | | | |



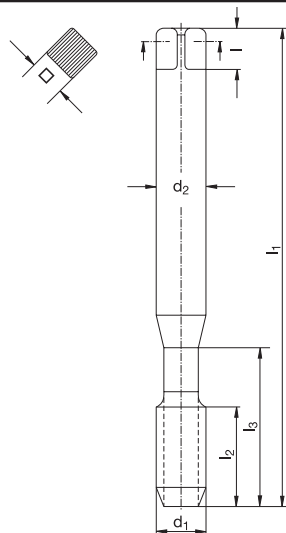
| DIN 371 | | | | | | | | | | | DIN 376 | | | | | | | | | | |
|--|-----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | | | | | | | Werkstoffgruppen Groupes de matières | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | | | | | | | | | Classification of work materials Gruppo materiali | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 2 | 1,6 | 060 311 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 3 | 10,2 | 064 660 | |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 060 314 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 3 | 14 | 064 662 | |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 316 | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 064 664 | |
| M 3,5 | 0,6 | 56 | 6 | 20 | 4 | 6 | 3 | 3 | 2,9 | 060 317 | | | | | | | | | | | |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 318 | | | | | | | | | | | |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 060 319 | | | | | | | | | | | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 060 320 | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 060 321 | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 060 322 | | | | | | | | | | | |



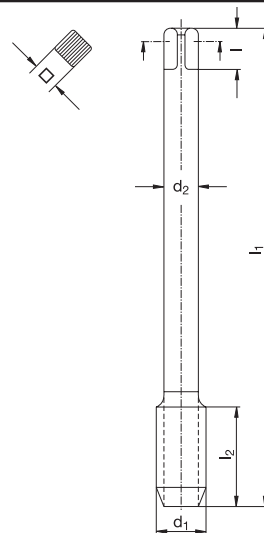


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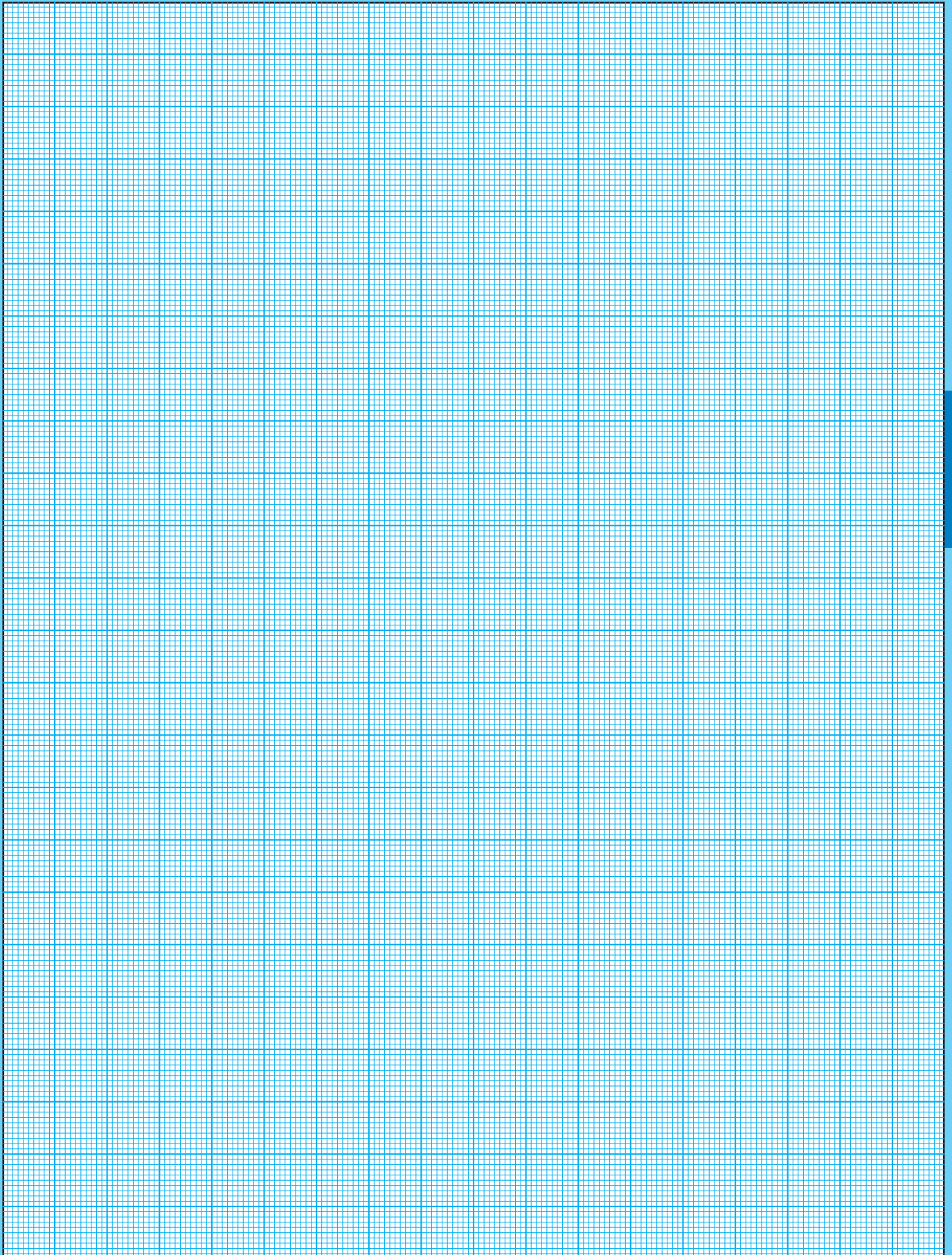
DIN
371

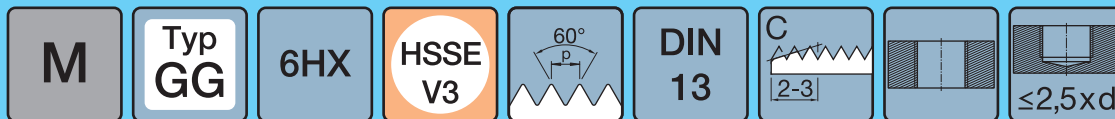


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376

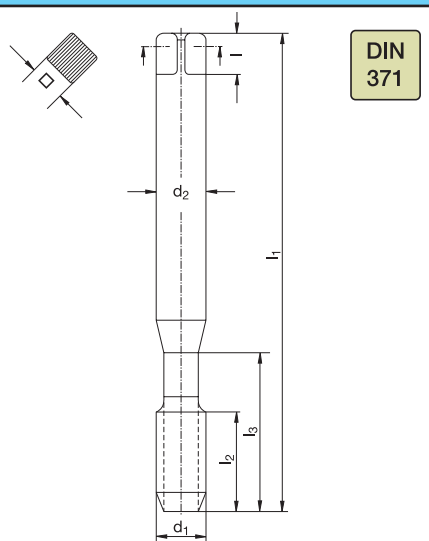


| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 371 201 ¹²⁰ GG-Ni-OX | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 376 201 ¹²⁰ GG-Ni-OX | | | | | | | | | | | | | | | |
|--|--|---|--|--|---|-----------|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|
| Werkstoffgruppen Groupes de matières | | 2; 3.2; 3.5; 3.6; 4.4; 4.5; 7.2; 7.3 | Werkstoffgruppen Groupes de matières | | 2; 3.2; 3.5; 3.6; 4.4; 4.5; 7.2; 7.3 | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 060 439 | M 8 | 1,25 | 90 | 22 | 6 | 8 | 4,9 | 4 | 6,8 | 060 464 |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 060 441 | M 10 | 1,5 | 100 | 24 | 7 | 8 | 5,5 | 4 | 8,5 | 060 465 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 060 442 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 4 | 10,2 | 060 466 |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 060 443 | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 4 | 14 | 060 468 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 4 | 6,8 | 060 444 | M 18 | 2,5 | 125 | 34 | 14 | 14 | 11 | 4 | 15,5 | 060 469 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 4 | 8,5 | 060 445 | M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 4 | 17,5 | 060 470 |
| | | | | | | | | | | | M 22 | 2,5 | 140 | 34 | 18 | 17 | 14,5 | 4 | 19,5 | 060 471 |
| | | | | | | | | | | | M 24 | 3 | 160 | 38 | 18 | 17 | 14,5 | 4 | 21 | 060 472 |

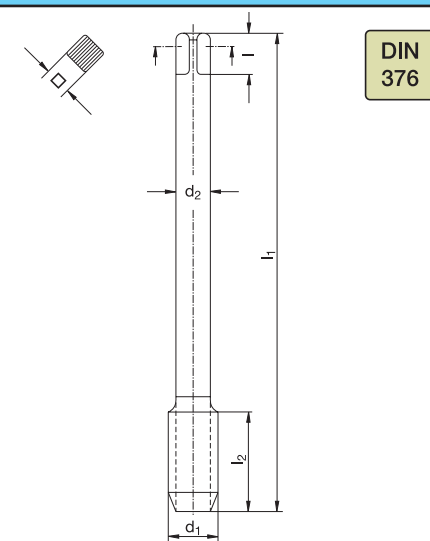




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DIN 376



| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo W% | 371 241 ⁴²⁰ GG-TiCN | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo W% | 376 241 ⁴²⁰ GG-TiCN | | | | | | | | | | | | | | | |
|--|---|---|--|---|---|-----------|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|
| Werkstoffgruppen Groupes de matières | | 2; 3.2; 3.5; 3.6; 4.4; 4.5; 7.2; 7.3 | Werkstoffgruppen Groupes de matières | | 2; 3.2; 3.5; 3.6; 4.4; 4.5; 7.2; 7.3 | | | | | | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 460 441 | M 5 | 0,8 | 70 | 16 | 3,5 | 6 | 2,7 | 3 | 4,2 | 460 462 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 460 442 | M 6 | 1 | 80 | 19 | 4,5 | 6 | 3,4 | 3 | 5 | 460 463 |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 460 443 | M 8 | 1,25 | 90 | 22 | 6 | 8 | 4,9 | 4 | 6,8 | 460 464 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 4 | 6,8 | 460 444 | M 10 | 1,5 | 100 | 24 | 7 | 8 | 5,5 | 4 | 8,5 | 460 465 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 4 | 8,5 | 460 445 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 4 | 10,2 | 460 466 |
| | | | | | | | | | | | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 4 | 14 | 460 468 |

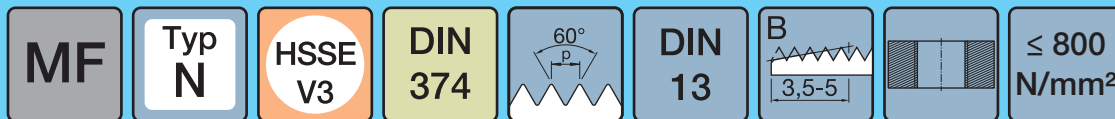


| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 374 100 ¹²⁰ | | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 374 100 ¹²⁰ | | | | | | | | | | |
|---|-----------|--|------------------------|---|-----------|---|-------|--|------------|---|-----------|------------------------|------------------------|------------------------|-----------|-----------|---------|-----------|------|--|
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 3 x 0,35 | 56 | 8 | 2,2 | - | - | 3 | 2,65 | 060 760 | M 22 x 1 | 125 | 25 | 18 | 17 | 14,5 | 3 | 21 | 060 791 | | | |
| M 4 x 0,5 | 63 | 10 | 2,8 | 5 | 2,1 | 3 | 3,5 | 060 762 | M 22 x 1,5 | 125 | 25 | 18 | 17 | 14,5 | 3 | 20,5 | 060 792 | | | |
| M 5 x 0,5 | 70 | 12 | 3,5 | 6 | 2,7 | 3 | 4,5 | 060 763 | M 22 x 2 | 140 | 34 | 18 | 17 | 14,5 | 3 | 20 | 060 793 | | | |
| M 6 x 0,5 | 80 | 14 | 4,5 | 6 | 3,4 | 3 | 5,5 | 060 764 | M 24 x 1 | 140 | 28 | 18 | 17 | 14,5 | 3 | 23 | 060 794 | | | |
| M 6 x 0,75 | 80 | 14 | 4,5 | 6 | 3,4 | 3 | 5,25 | 060 765 | M 24 x 1,5 | 140 | 28 | 18 | 17 | 14,5 | 3 | 22,5 | 060 795 | | | |
| M 7 x 0,75 | 80 | 14 | 5,5 | 7 | 4,3 | 3 | 6,25 | 060 766 | M 24 x 2 | 140 | 28 | 18 | 17 | 14,5 | 3 | 22 | 060 796 | | | |
| M 8 x 0,5 | 80 | 18 | 6 | 8 | 4,9 | 3 | 7,5 | 060 767 | M 25 x 1,5 | 140 | 28 | 18 | 17 | 14,5 | 3 | 23,5 | 060 816 | | | |
| M 8 x 0,75 | 80 | 18 | 6 | 8 | 4,9 | 3 | 7,25 | 060 768 | M 26 x 1,5 | 140 | 28 | 18 | 17 | 14,5 | 4 | 24,5 | 060 797 | | | |
| M 8 x 1 | 90 | 22 | 6 | 8 | 4,9 | 3 | 7 | 060 769 | M 27 x 1,5 | 140 | 28 | 20 | 19 | 16 | 4 | 25,5 | 060 798 | | | |
| M 9 x 1 | 90 | 22 | 7 | 8 | 5,5 | 3 | 8 | 060 770 | M 27 x 2 | 140 | 28 | 20 | 19 | 16 | 4 | 25 | 060 799 | | | |
| M 10 x 0,75 | 90 | 20 | 7 | 8 | 5,5 | 3 | 9,25 | 060 771 | M 28 x 1,5 | 140 | 28 | 20 | 19 | 16 | 4 | 26,5 | 060 800 | | | |
| M 10 x 1 | 90 | 20 | 7 | 8 | 5,5 | 3 | 9 | 060 772 | M 30 x 1 | 150 | 28 | 22 | 21 | 18 | 4 | 29 | 060 801 | | | |
| M 10 x 1,25 | 100 | 24 | 7 | 8 | 5,5 | 3 | 8,75 | 060 773 | M 30 x 1,5 | 150 | 28 | 22 | 21 | 18 | 4 | 28,5 | 060 802 | | | |
| M 11 x 1 | 90 | 20 | 8 | 9 | 6,2 | 3 | 10 | 060 774 | M 30 x 2 | 150 | 28 | 22 | 21 | 18 | 4 | 28 | 060 803 | | | |
| M 12 x 1 | 100 | 22 | 9 | 10 | 7 | 3 | 11 | 060 775 | M 32 x 1,5 | 150 | 28 | 22 | 21 | 18 | 4 | 30,5 | 060 804 | | | |
| M 12 x 1,25 | 100 | 22 | 9 | 10 | 7 | 3 | 10,75 | 060 776 | M 33 x 1,5 | 160 | 30 | 25 | 23 | 20 | 4 | 31,5 | 060 805 | | | |
| M 12 x 1,5 | 100 | 22 | 9 | 10 | 7 | 3 | 10,5 | 060 777 | M 34 x 1,5 | 170 | 30 | 28 | 25 | 22 | 4 | 32,5 | 060 806 | | | |
| M 14 x 1 | 100 | 22 | 11 | 12 | 9 | 3 | 13 | 060 778 | M 35 x 1,5 | 170 | 30 | 28 | 25 | 22 | 4 | 33,5 | 060 807 | | | |
| M 14 x 1,25 | 100 | 22 | 11 | 12 | 9 | 3 | 12,75 | 060 779 | M 36 x 1,5 | 170 | 30 | 28 | 25 | 22 | 4 | 34,5 | 060 808 | | | |
| M 14 x 1,5 | 100 | 22 | 11 | 12 | 9 | 3 | 12,5 | 060 780 | M 38 x 1,5 | 170 | 30 | 28 | 25 | 22 | 4 | 36,5 | 060 809 | | | |
| M 15 x 1 | 100 | 22 | 12 | 12 | 9 | 3 | 14 | 060 781 | M 40 x 1,5 | 170 | 30 | 32 | 27 | 24 | 4 | 38,5 | 060 810 | | | |
| M 15 x 1,5 | 100 | 22 | 12 | 12 | 9 | 3 | 13,5 | 060 782 | M 42 x 1,5 | 170 | 30 | 32 | 27 | 24 | 4 | 40,5 | 060 811 | | | |
| M 16 x 1 | 100 | 22 | 12 | 12 | 9 | 3 | 15 | 060 783 | M 45 x 1,5 | 180 | 32 | 36 | 32 | 29 | 4 | 43,5 | 060 812 | | | |
| M 16 x 1,5 | 100 | 22 | 12 | 12 | 9 | 3 | 14,5 | 060 784 | M 48 x 1,5 | 190 | 32 | 36 | 32 | 29 | 4 | 46,5 | 060 813 | | | |
| M 18 x 1 | 110 | 25 | 14 | 14 | 11 | 3 | 17 | 060 785 | M 50 x 1,5 | 190 | 32 | 36 | 32 | 29 | 4 | 48,5 | 060 814 | | | |
| M 18 x 1,5 | 110 | 25 | 14 | 14 | 11 | 3 | 16,5 | 060 786 | M 52 x 1,5 | 190 | 32 | 40 | 35 | 32 | 4 | 50,5 | 060 815 | | | |
| M 18 x 2 | 125 | 34 | 14 | 14 | 11 | 3 | 16 | 060 787 | | | | | | | | | | | | |
| M 20 x 1 | 125 | 25 | 16 | 15 | 12 | 3 | 19 | 060 788 | | | | | | | | | | | | |
| M 20 x 1,5 | 125 | 25 | 16 | 15 | 12 | 3 | 18,5 | 060 789 | | | | | | | | | | | | |
| M 20 x 2 | 140 | 34 | 16 | 15 | 12 | 3 | 18 | 060 790 | | | | | | | | | | | | |

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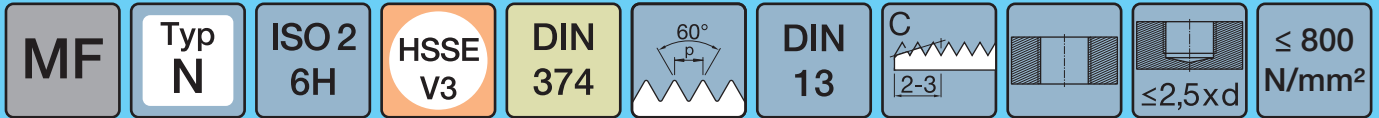


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V3



| ISO 2 6H | | ISO 3 6G | | | | | | | | | | | | | | | | | |
|---|--|---|---|--|---|---|------|---------|------------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|------|---------|---|------|
| | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 374 190 ⁴²⁰ TiN | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 374 106 ¹²⁰ - | | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | 1.1-1.3 | Werkstoffgruppen Groupes de matières | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ | z | ∅ | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ | z | ∅ | Code |
| M 6 x 0,75 | 80 | 14 | 4,5 | 6 | 3,4 | 3 | 5,25 | 960 765 | M 6 x 0,75 | 80 | 14 | 4,5 | 6 | 3,4 | 3 | 5,25 | 061 765 | | |
| M 8 x 1 | 90 | 22 | 6 | 8 | 4,9 | 3 | 7 | 960 769 | M 8 x 1 | 90 | 22 | 6 | 8 | 4,9 | 3 | 7 | 061 769 | | |
| M 10 x 1 | 90 | 20 | 7 | 8 | 5,5 | 3 | 9 | 960 772 | M 10 x 1 | 90 | 20 | 7 | 8 | 5,5 | 3 | 9 | 061 772 | | |
| M 12 x 1,5 | 100 | 22 | 9 | 10 | 7 | 3 | 10,5 | 960 777 | M 12 x 1,5 | 100 | 22 | 9 | 10 | 7 | 3 | 10,5 | 061 777 | | |
| M 16 x 1,5 | 100 | 22 | 12 | 12 | 9 | 3 | 14,5 | 960 784 | M 14 x 1,5 | 100 | 22 | 11 | 12 | 9 | 3 | 12,5 | 061 780 | | |
| | | | | | | | | | M 16 x 1,5 | 100 | 22 | 12 | 12 | 9 | 3 | 14,5 | 061 784 | | |
| | | | | | | | | | M 18 x 1,5 | 110 | 25 | 14 | 14 | 11 | 3 | 16,5 | 061 786 | | |
| | | | | | | | | | M 20 x 1,5 | 125 | 25 | 16 | 15 | 12 | 3 | 18,5 | 061 789 | | |



| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 374 200 ¹²⁰ | | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 374 200 ¹²⁰ | | | | | | | | | |
|---|-----------|--|------------------------|---|-----------|---|-------|--|------------|---|-----------|------------------------|------------------------|------------------------|-----------|-----------|---------|-----------|------|
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code |
| M 3 x 0,35 | 56 | 8 | 2,2 | - | - | 3 | 2,65 | 060 868 | M 22 x 1 | 125 | 25 | 18 | 17 | 14,5 | 4 | 21 | 060 899 | | |
| M 4 x 0,5 | 63 | 10 | 2,8 | 5 | 2,1 | 3 | 3,5 | 060 870 | M 22 x 1,5 | 125 | 25 | 18 | 17 | 14,5 | 4 | 20,5 | 060 900 | | |
| M 5 x 0,5 | 70 | 12 | 3,5 | 6 | 2,7 | 3 | 4,5 | 060 871 | M 22 x 2 | 140 | 34 | 18 | 17 | 14,5 | 4 | 20 | 060 901 | | |
| M 6 x 0,5 | 80 | 14 | 4,5 | 6 | 3,4 | 3 | 5,5 | 060 872 | M 24 x 1 | 140 | 28 | 18 | 17 | 14,5 | 4 | 23 | 060 902 | | |
| M 6 x 0,75 | 80 | 14 | 4,5 | 6 | 3,4 | 4 | 5,25 | 060 873 | M 24 x 1,5 | 140 | 28 | 18 | 17 | 14,5 | 4 | 22,5 | 060 903 | | |
| M 7 x 0,75 | 80 | 14 | 5,5 | 7 | 4,3 | 4 | 6,25 | 060 874 | M 24 x 2 | 140 | 28 | 18 | 17 | 14,5 | 4 | 22 | 060 904 | | |
| M 8 x 0,5 | 80 | 18 | 6 | 8 | 4,9 | 4 | 7,5 | 060 875 | M 25 x 1,5 | 140 | 28 | 18 | 17 | 14,5 | 4 | 23,5 | 060 924 | | |
| M 8 x 0,75 | 80 | 18 | 6 | 8 | 4,9 | 4 | 7,25 | 060 876 | M 26 x 1,5 | 140 | 28 | 18 | 17 | 14,5 | 4 | 24,5 | 060 905 | | |
| M 8 x 1 | 90 | 22 | 6 | 8 | 4,9 | 4 | 7 | 060 877 | M 27 x 1,5 | 140 | 28 | 20 | 19 | 16 | 4 | 25,5 | 060 906 | | |
| M 9 x 1 | 90 | 22 | 7 | 8 | 5,5 | 4 | 8 | 060 878 | M 27 x 2 | 140 | 28 | 20 | 19 | 16 | 4 | 25 | 060 907 | | |
| M 10 x 0,75 | 90 | 20 | 7 | 8 | 5,5 | 4 | 9,25 | 060 879 | M 28 x 1,5 | 140 | 28 | 20 | 19 | 16 | 4 | 26,5 | 060 908 | | |
| M 10 x 1 | 90 | 20 | 7 | 8 | 5,5 | 4 | 9 | 060 880 | M 30 x 1 | 150 | 28 | 22 | 21 | 18 | 4 | 29 | 060 909 | | |
| M 10 x 1,25 | 100 | 24 | 7 | 8 | 5,5 | 4 | 8,75 | 060 881 | M 30 x 1,5 | 150 | 28 | 22 | 21 | 18 | 4 | 28,5 | 060 910 | | |
| M 11 x 1 | 90 | 20 | 8 | 9 | 6,2 | 4 | 10 | 060 882 | M 30 x 2 | 150 | 28 | 22 | 21 | 18 | 4 | 28 | 060 911 | | |
| M 12 x 1 | 100 | 22 | 9 | 10 | 7 | 4 | 11 | 060 883 | M 32 x 1,5 | 150 | 28 | 22 | 21 | 18 | 6 | 30,5 | 060 912 | | |
| M 12 x 1,25 | 100 | 22 | 9 | 10 | 7 | 4 | 10,75 | 060 884 | M 33 x 1,5 | 160 | 30 | 25 | 23 | 20 | 6 | 31,5 | 060 913 | | |
| M 12 x 1,5 | 100 | 22 | 9 | 10 | 7 | 4 | 10,5 | 060 885 | M 34 x 1,5 | 170 | 30 | 28 | 25 | 22 | 6 | 32,5 | 060 914 | | |
| M 14 x 1 | 100 | 22 | 11 | 12 | 9 | 4 | 13 | 060 886 | M 35 x 1,5 | 170 | 30 | 28 | 25 | 22 | 6 | 33,5 | 060 915 | | |
| M 14 x 1,25 | 100 | 22 | 11 | 12 | 9 | 4 | 12,75 | 060 887 | M 36 x 1,5 | 170 | 30 | 28 | 25 | 22 | 6 | 34,5 | 060 916 | | |
| M 14 x 1,5 | 100 | 22 | 11 | 12 | 9 | 4 | 12,5 | 060 888 | M 38 x 1,5 | 170 | 30 | 28 | 25 | 22 | 6 | 36,5 | 060 917 | | |
| M 15 x 1 | 100 | 22 | 12 | 12 | 9 | 4 | 14 | 060 889 | M 40 x 1,5 | 170 | 30 | 32 | 27 | 24 | 6 | 38,5 | 060 918 | | |
| M 15 x 1,5 | 100 | 22 | 12 | 12 | 9 | 4 | 13,5 | 060 890 | M 50 x 1,5 | 190 | 32 | 36 | 32 | 29 | 6 | 48,5 | 060 922 | | |
| M 16 x 1 | 100 | 22 | 12 | 12 | 9 | 4 | 15 | 060 891 | | | | | | | | | | | |
| M 16 x 1,5 | 100 | 22 | 12 | 12 | 9 | 4 | 14,5 | 060 892 | | | | | | | | | | | |
| M 18 x 1 | 110 | 25 | 14 | 14 | 11 | 4 | 17 | 060 893 | | | | | | | | | | | |
| M 18 x 1,5 | 110 | 25 | 14 | 14 | 11 | 4 | 16,5 | 060 894 | | | | | | | | | | | |
| M 18 x 2 | 125 | 34 | 14 | 14 | 11 | 4 | 16 | 060 895 | | | | | | | | | | | |
| M 20 x 1 | 125 | 25 | 16 | 15 | 12 | 4 | 19 | 060 896 | | | | | | | | | | | |
| M 20 x 1,5 | 125 | 25 | 16 | 15 | 12 | 4 | 18,5 | 060 897 | | | | | | | | | | | |
| M 20 x 2 | 140 | 34 | 16 | 15 | 12 | 4 | 18 | 060 898 | | | | | | | | | | | |

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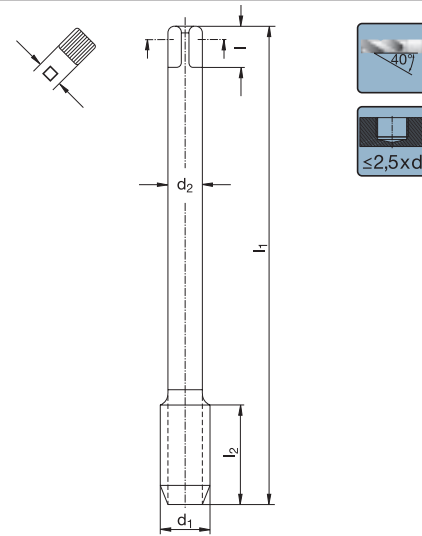
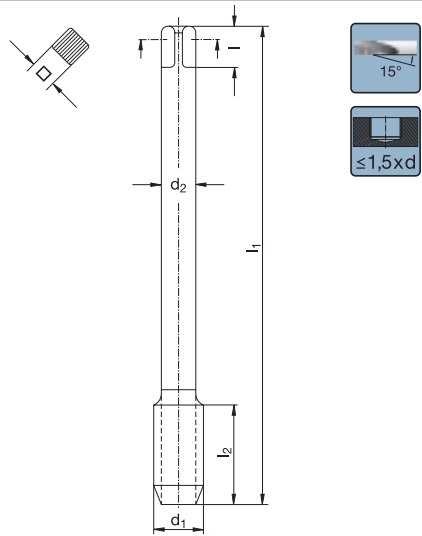
HSSE-V3





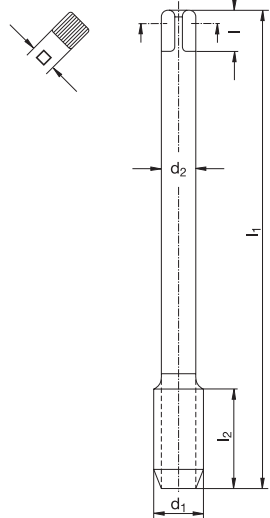

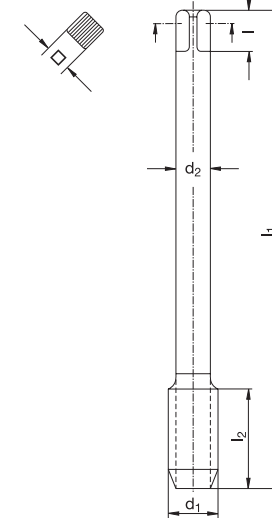
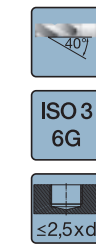
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HSSE-
V3



| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 374 150 ¹²⁰ | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 374 300 ¹²⁰ | | | | | | | | | | | |
|---|-----|--|-----|---|------|--|------|---------|-------------|-----|----|-----|----|------|---|------|---------|
| Catalogue n° ^{W%} | | - | | Catalogue n° ^{W%} | | - | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | | | | | | | |
| d ₁ P l ₁ l ₂ d ₂ l □ z Ø | | Code | | d ₁ P l ₁ l ₂ d ₂ l □ z Ø | | Code | | | | | | | | | | | |
| [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | [mm] | | [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | [mm] | | | | | | | | | | | |
| M 4 x 0,5 | 63 | 6 | 2,8 | 5 | 2,1 | 3 | 3,5 | 061 060 | M 3 x 0,35 | 56 | 4 | 2,2 | - | - | 3 | 2,65 | 061 020 |
| M 5 x 0,5 | 70 | 7 | 3,5 | 6 | 2,7 | 3 | 4,5 | 061 061 | M 4 x 0,5 | 63 | 6 | 2,8 | 5 | 2,1 | 3 | 3,5 | 061 021 |
| M 6 x 0,75 | 80 | 8 | 4,5 | 6 | 3,4 | 3 | 5,25 | 061 062 | M 5 x 0,5 | 70 | 7 | 3,5 | 6 | 2,7 | 3 | 4,5 | 061 022 |
| M 8 x 0,75 | 80 | 10 | 6 | 8 | 4,9 | 3 | 7,25 | 061 063 | M 6 x 0,5 | 80 | 8 | 4,5 | 6 | 3,4 | 3 | 5,5 | 061 037 |
| M 8 x 1 | 90 | 10 | 6 | 8 | 4,9 | 3 | 7 | 061 064 | M 6 x 0,75 | 80 | 8 | 4,5 | 6 | 3,4 | 3 | 5,25 | 061 038 |
| M 10 x 1 | 90 | 12 | 7 | 8 | 5,5 | 3 | 9 | 061 065 | M 8 x 0,75 | 80 | 10 | 6 | 8 | 4,9 | 3 | 7,25 | 061 039 |
| M 10 x 1,25 | 100 | 12 | 7 | 8 | 5,5 | 3 | 8,8 | 061 066 | M 8 x 1 | 90 | 10 | 6 | 8 | 4,9 | 3 | 7 | 061 040 |
| M 12 x 1 | 100 | 14 | 9 | 10 | 7 | 3 | 11 | 061 067 | M 10 x 1 | 90 | 12 | 7 | 8 | 5,5 | 3 | 9 | 061 041 |
| M 12 x 1,25 | 100 | 14 | 9 | 10 | 7 | 3 | 10,8 | 061 068 | M 10 x 1,25 | 100 | 12 | 7 | 8 | 5,5 | 3 | 8,8 | 061 023 |
| M 12 x 1,5 | 100 | 14 | 9 | 10 | 7 | 3 | 10,5 | 061 069 | M 12 x 1 | 100 | 14 | 9 | 10 | 7 | 3 | 11 | 061 042 |
| M 14 x 1 | 100 | 16 | 11 | 12 | 9 | 3 | 13 | 061 070 | M 12 x 1,25 | 100 | 14 | 9 | 10 | 7 | 3 | 10,8 | 061 024 |
| M 14 x 1,25 | 100 | 16 | 11 | 12 | 9 | 3 | 12,8 | 061 071 | M 12 x 1,5 | 100 | 14 | 9 | 10 | 7 | 3 | 10,5 | 061 043 |
| M 14 x 1,5 | 100 | 16 | 11 | 12 | 9 | 3 | 12,5 | 061 072 | M 14 x 1 | 100 | 16 | 11 | 12 | 9 | 3 | 13 | 061 025 |
| M 16 x 1 | 100 | 16 | 12 | 12 | 9 | 3 | 15 | 061 073 | M 14 x 1,25 | 100 | 16 | 11 | 12 | 9 | 3 | 12,8 | 061 026 |
| M 16 x 1,5 | 100 | 16 | 12 | 12 | 9 | 3 | 14,5 | 061 074 | M 14 x 1,5 | 100 | 16 | 11 | 12 | 9 | 3 | 12,5 | 061 044 |
| M 18 x 1 | 110 | 20 | 14 | 14 | 11 | 4 | 17 | 061 075 | M 16 x 1 | 100 | 16 | 12 | 12 | 9 | 3 | 15 | 061 027 |
| M 18 x 1,5 | 110 | 20 | 14 | 14 | 11 | 4 | 16,5 | 061 076 | M 16 x 1,5 | 100 | 16 | 12 | 12 | 9 | 3 | 14,5 | 061 045 |
| M 20 x 1 | 125 | 20 | 16 | 15 | 12 | 4 | 19 | 061 077 | M 18 x 1 | 110 | 20 | 14 | 14 | 11 | 4 | 17 | 061 028 |
| M 20 x 1,5 | 125 | 20 | 16 | 15 | 12 | 4 | 18,5 | 061 078 | M 18 x 1,5 | 110 | 20 | 14 | 14 | 11 | 4 | 16,5 | 061 046 |
| M 22 x 1,5 | 125 | 20 | 18 | 17 | 14,5 | 4 | 20,5 | 061 079 | M 20 x 1 | 125 | 20 | 16 | 15 | 12 | 4 | 19 | 061 029 |
| M 24 x 1,5 | 140 | 24 | 18 | 17 | 14,5 | 4 | 22,5 | 061 080 | M 20 x 1,5 | 125 | 20 | 16 | 15 | 12 | 4 | 18,5 | 061 047 |
| M 24 x 2 | 140 | 24 | 18 | 17 | 14,5 | 4 | 22 | 061 081 | M 22 x 1,5 | 125 | 20 | 18 | 17 | 14,5 | 4 | 20,5 | 061 048 |
| M 26 x 1,5 | 140 | 24 | 18 | 17 | 14,5 | 4 | 24,5 | 061 082 | M 24 x 1,5 | 140 | 24 | 18 | 17 | 14,5 | 4 | 22,5 | 061 049 |
| M 27 x 1,5 | 140 | 24 | 20 | 19 | 16 | 4 | 25,5 | 061 083 | M 24 x 2 | 140 | 24 | 18 | 17 | 14,5 | 4 | 22 | 061 030 |
| M 27 x 2 | 140 | 24 | 20 | 19 | 16 | 4 | 25 | 061 084 | M 25 x 1,5 | 140 | 24 | 18 | 17 | 14,5 | 4 | 23,5 | 061 050 |
| M 28 x 1,5 | 140 | 24 | 20 | 19 | 16 | 4 | 26,5 | 061 085 | M 26 x 1,5 | 140 | 24 | 18 | 17 | 14,5 | 4 | 24,5 | 061 031 |
| M 30 x 1,5 | 150 | 28 | 22 | 21 | 18 | 4 | 28,5 | 061 086 | M 27 x 1,5 | 140 | 24 | 20 | 19 | 16 | 4 | 25,5 | 061 032 |
| M 30 x 2 | 150 | 28 | 22 | 21 | 18 | 4 | 28 | 061 087 | M 27 x 2 | 140 | 24 | 20 | 19 | 16 | 4 | 25 | 061 033 |
| | | | | | | | | | M 28 x 1,5 | 140 | 24 | 20 | 19 | 16 | 4 | 26,5 | 061 034 |
| | | | | | | | | | M 30 x 1,5 | 150 | 28 | 22 | 21 | 18 | 4 | 28,5 | 061 035 |
| | | | | | | | | | M 30 x 2 | 150 | 28 | 22 | 21 | 18 | 4 | 28 | 061 036 |

MF Typ N HSSE V3 DIN 374 60° DIN 13 C 2-3 ≤ 800 N/mm²

|   | |   | | | | | | | | | | | | | | | | | |
|---|--|--|--|--|-----------|-----------|------|-----------|------------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---------|-----------|------|
| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 374 390 ⁴²⁰ TiN | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | 1.1-1.3 | Werkstoffgruppen Groupes de matières | | | | | | | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code |
| M 8 x 1 | 90 | 10 | 6 | 8 | 4,9 | 3 | 7 | 961 040 | M 6 x 0,75 | 80 | 8 | 4,5 | 6 | 3,4 | 3 | 5,25 | 061 838 | | |
| M 10 x 1 | 90 | 12 | 7 | 8 | 5,5 | 3 | 9 | 961 041 | M 8 x 1 | 90 | 10 | 6 | 8 | 4,9 | 3 | 7 | 061 840 | | |
| M 12 x 1,5 | 100 | 14 | 9 | 10 | 7 | 3 | 10,5 | 961 043 | M 10 x 1 | 90 | 12 | 7 | 8 | 5,5 | 3 | 9 | 061 841 | | |
| M 16 x 1,5 | 100 | 16 | 12 | 12 | 9 | 3 | 14,5 | 961 045 | M 12 x 1,5 | 100 | 14 | 9 | 10 | 7 | 3 | 10,5 | 061 843 | | |
| | | | | | | | | | | M 14 x 1,5 | 100 | 16 | 11 | 12 | 9 | 3 | 12,5 | 061 844 | |
| | | | | | | | | | | M 16 x 1,5 | 100 | 16 | 12 | 12 | 9 | 3 | 14,5 | 061 845 | |
| | | | | | | | | | | M 18 x 1,5 | 110 | 20 | 14 | 14 | 11 | 4 | 16,5 | 061 846 | |
| | | | | | | | | | | M 20 x 1,5 | 125 | 20 | 16 | 15 | 12 | 4 | 18,5 | 061 847 | |

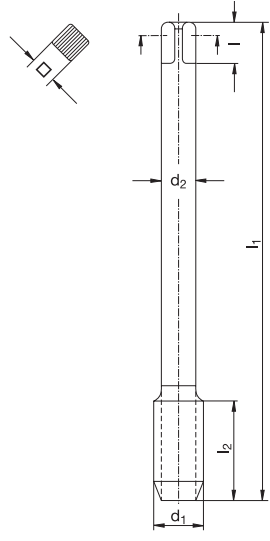
MF
HSSE-V3





MF

HSSE-
V3



Katalog-Nr. ^{W%} **374 103¹³⁰**
 Catalogue no. ^{W%}
 Catalogue n° ^{W%} **VA-OX**
 Nr. di catalogo ^{W%}

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali
1; 2; 4.4; 4.5; 5.1;
5.2; 6.1; 6.2; 7.2;
7.3

| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ | z | ∅ [mm] | Code |
|------------------------|-----------|------------------------|------------------------|------------------------|-----------|------|---|-----------|----------|
| M 3 x 0,35 | 0,35 | 56 | 8 | 2,2 | - | - | 3 | 2,65 | 030 027 |
| M 4 x 0,5 | 0,5 | 63 | 10 | 2,8 | 5 | 2,1 | 3 | 3,5 | 030 028 |
| M 5 x 0,5 | 0,5 | 70 | 12 | 3,5 | 6 | 2,7 | 3 | 4,5 | 030 029 |
| M 6 x 0,5 | 0,5 | 80 | 14 | 4,5 | 6 | 3,4 | 3 | 5,5 | 030 030 |
| M 6 x 0,75 | 0,75 | 80 | 14 | 4,5 | 6 | 3,4 | 3 | 5,25 | 030 031 |
| M 8 x 0,75 | 0,75 | 80 | 18 | 6 | 8 | 4,9 | 3 | 7,25 | 030 032 |
| M 8 x 1 | 1 | 90 | 22 | 6 | 8 | 4,9 | 3 | 7 | 030 033 |
| M 10 x 1 | 1 | 90 | 20 | 7 | 8 | 5,5 | 3 | 9 | 030 034 |
| M 12 x 1 | 1 | 100 | 22 | 9 | 10 | 7 | 3 | 11 | 030 035 |
| M 12 x 1,5 | 1,5 | 100 | 22 | 9 | 10 | 7 | 3 | 10,5 | 030 036 |
| M 14 x 1,5 | 1,5 | 100 | 22 | 11 | 12 | 9 | 3 | 12,5 | 030 037 |
| M 16 x 1,5 | 1,5 | 100 | 22 | 12 | 12 | 9 | 3 | 14,5 | 030 038 |
| M 18 x 1,5 | 1,5 | 110 | 25 | 14 | 14 | 11 | 3 | 16,5 | 030 039 |
| M 20 x 1,5 | 1,5 | 125 | 25 | 16 | 15 | 12 | 3 | 18,5 | 030 040 |
| M 22 x 1,5 | 1,5 | 125 | 25 | 18 | 17 | 14,5 | 3 | 20,5 | 030 041 |
| M 24 x 1,5 | 1,5 | 140 | 28 | 18 | 17 | 14,5 | 3 | 22,5 | 030 042 |

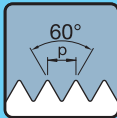
MF

Typ
VA

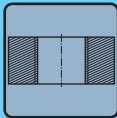
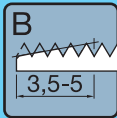
ISO 3
6G

HSSE
V3

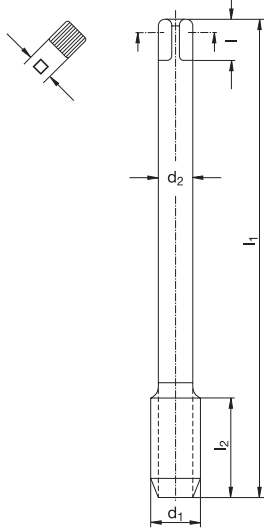
DIN
374



DIN
13



≤ 1200
N/mm²



MF

HSSE-
V3



Katalog-Nr. ^{W%} Catalogue no. ^{W%} **374 163¹³⁰**
Catalogue n° ^{W%} Nr. di catalogo ^{W%} **VA-OX**

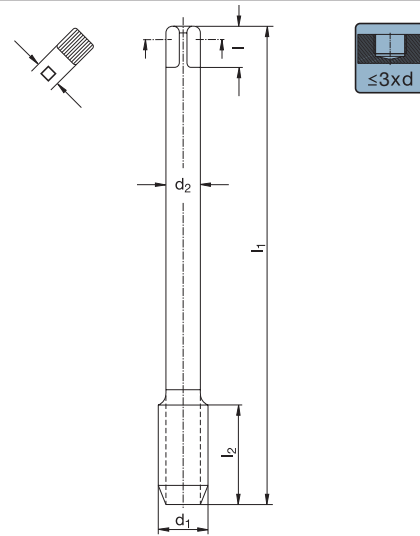
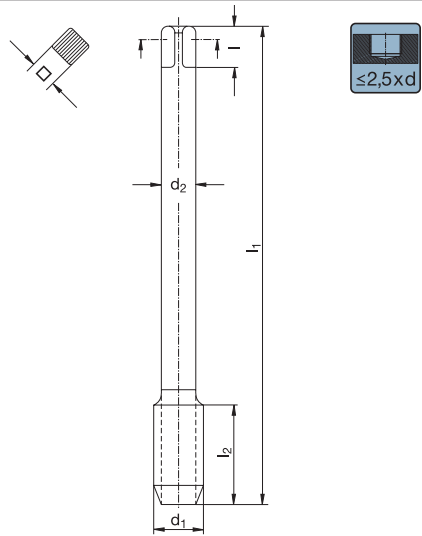
Werkstoffgruppen Classification of work materials 1; 2; 4.4; 4.5; 5.1;
Groupes de matières Gruppo materiali 5.2; 6.1; 6.2; 7.2;
7.3

| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|------|-----------|----------|
| M 6 x 0,75 | 80 | 14 | 4,5 | 6 | 3,4 | 3 | 5,3 | 031 031 | |
| M 8 x 1 | 90 | 22 | 6 | 8 | 4,9 | 3 | 7 | 031 033 | |
| M 10 x 1 | 90 | 20 | 7 | 8 | 5,5 | 3 | 9 | 031 034 | |
| M 12 x 1,5 | 100 | 22 | 9 | 10 | 7 | 3 | 10,5 | 031 036 | |
| M 14 x 1,5 | 100 | 22 | 11 | 12 | 9 | 3 | 12,5 | 031 037 | |
| M 16 x 1,5 | 100 | 22 | 12 | 12 | 9 | 3 | 14,5 | 031 038 | |
| M 18 x 1,5 | 110 | 25 | 14 | 14 | 11 | 3 | 16,5 | 031 039 | |
| M 20 x 1,5 | 125 | 25 | 16 | 15 | 12 | 3 | 18,5 | 031 040 | |



MF

HSSE-
V3



Katalog-Nr. ^{W%} Catalogue no. ^{W%}
Catalogue n^o ^{W%} Nr. di catalogo ^{W%}

374 303¹³⁰
VA-OX

Katalog-Nr. ^{W%} Catalogue no. ^{W%}
Catalogue n^o ^{W%} Nr. di catalogo ^{W%}

374 343⁴³⁰
VA-TiCN

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1; 2; 4.4; 4.5; 5.1;
5.2; 6.1; 6.2; 7.2;
7.3

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1; 2; 3.1; 3.3; 3.4;
4; 5.1; 5.2; 6.1;
6.2; 7

| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] |
|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|
|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|

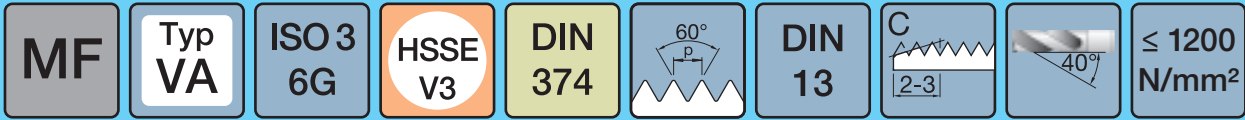
Code

| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] |
|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|
|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|

Code

| | | | | | | | | |
|------------|-----|----|-----|----|------|---|------|---------|
| M 3 x 0,35 | 56 | 4 | 2,2 | - | - | 3 | 2,65 | 030 167 |
| M 4 x 0,5 | 63 | 6 | 2,8 | 5 | 2,1 | 3 | 3,5 | 030 168 |
| M 5 x 0,5 | 70 | 7 | 3,5 | 6 | 2,7 | 3 | 4,5 | 030 169 |
| M 6 x 0,5 | 80 | 8 | 4,5 | 6 | 3,4 | 3 | 5,5 | 030 170 |
| M 6 x 0,75 | 80 | 8 | 4,5 | 6 | 3,4 | 3 | 5,3 | 030 171 |
| M 8 x 0,75 | 80 | 10 | 6 | 8 | 4,9 | 3 | 7,3 | 030 172 |
| M 8 x 1 | 90 | 10 | 6 | 8 | 4,9 | 3 | 7 | 030 173 |
| M 10 x 1 | 90 | 12 | 7 | 8 | 5,5 | 4 | 9 | 030 174 |
| M 12 x 1 | 100 | 14 | 9 | 10 | 7 | 4 | 11 | 030 175 |
| M 12 x 1,5 | 100 | 14 | 9 | 10 | 7 | 4 | 10,5 | 030 176 |
| M 14 x 1,5 | 100 | 16 | 11 | 12 | 9 | 4 | 12,5 | 030 177 |
| M 16 x 1,5 | 100 | 16 | 12 | 12 | 9 | 5 | 14,5 | 030 178 |
| M 18 x 1,5 | 110 | 20 | 14 | 14 | 11 | 5 | 16,5 | 030 179 |
| M 20 x 1,5 | 125 | 20 | 16 | 15 | 12 | 5 | 18,5 | 030 180 |
| M 22 x 1,5 | 125 | 20 | 18 | 17 | 14,5 | 5 | 20,5 | 030 181 |
| M 24 x 1,5 | 140 | 24 | 18 | 17 | 14,5 | 5 | 22,5 | 030 182 |
| M 27 x 1,5 | 140 | 24 | 20 | 19 | 16 | 5 | 25,5 | 030 183 |
| M 30 x 1,5 | 150 | 28 | 22 | 21 | 18 | 5 | 28,5 | 030 184 |

| | | | | | | | | |
|------------|-----|----|----|----|-----|---|------|---------|
| M 8 x 1 | 90 | 10 | 6 | 8 | 4,9 | 3 | 7 | 430 173 |
| M 10 x 1 | 90 | 12 | 7 | 8 | 5,5 | 4 | 9 | 430 174 |
| M 12 x 1,5 | 100 | 14 | 9 | 10 | 7 | 4 | 10,5 | 430 176 |
| M 16 x 1,5 | 100 | 16 | 12 | 12 | 9 | 5 | 14,5 | 430 178 |
| M 20 x 1,5 | 125 | 20 | 16 | 15 | 12 | 5 | 18,5 | 430 180 |

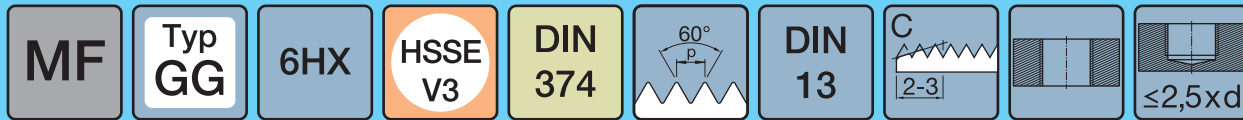


| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 374 363 ¹³⁰ VA-OX | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 374 364 ⁴³⁰ VA-TiCN | | | | | | | | | | | | | | |
|--|--|--|--|--|---|---|------|-----------|------------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|------|---|-----------|----------|
| Werkstoffgruppen Groupes de matières | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | Werkstoffgruppen Groupes de matières | | 1; 2; 3.1; 3.3; 3.4; 4; 5.1; 5.2; 6.1; 6.2; 7 | | | | | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ | z | Ø [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ | z | Ø [mm] | Code |
| M 8 x 1 | 90 | 10 | 6 | 8 | 4,9 | 3 | 7 | 031 173 | M 8 x 1 | 90 | 10 | 6 | 8 | 4,9 | 3 | 7 | | 431 173 | |
| M 10 x 1 | 90 | 12 | 7 | 8 | 5,5 | 4 | 9 | 031 174 | M 10 x 1 | 90 | 12 | 7 | 8 | 5,5 | 4 | 9 | | 431 174 | |
| M 12 x 1,5 | 100 | 14 | 9 | 10 | 7 | 4 | 10,5 | 031 176 | M 12 x 1,5 | 100 | 14 | 9 | 10 | 7 | 4 | 10,5 | | 431 176 | |
| M 14 x 1,5 | 100 | 16 | 11 | 12 | 9 | 4 | 12,5 | 031 177 | M 16 x 1,5 | 100 | 16 | 12 | 12 | 9 | 5 | 14,5 | | 431 178 | |
| M 16 x 1,5 | 100 | 16 | 12 | 12 | 9 | 5 | 14,5 | 031 178 | M 20 x 1,5 | 125 | 20 | 16 | 15 | 12 | 5 | 18,5 | | 431 180 | |
| M 18 x 1,5 | 110 | 20 | 14 | 14 | 11 | 5 | 16,5 | 031 179 | | | | | | | | | | | |
| M 20 x 1,5 | 125 | 20 | 16 | 15 | 12 | 5 | 18,5 | 031 180 | | | | | | | | | | | |

MF

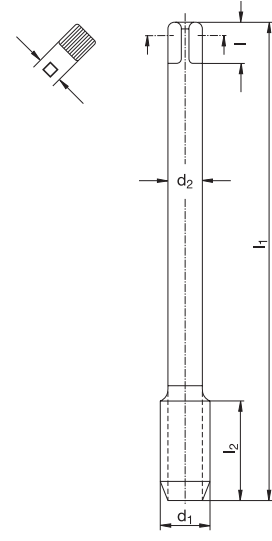
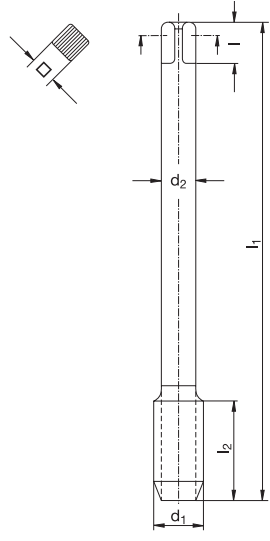
HSSE-V3





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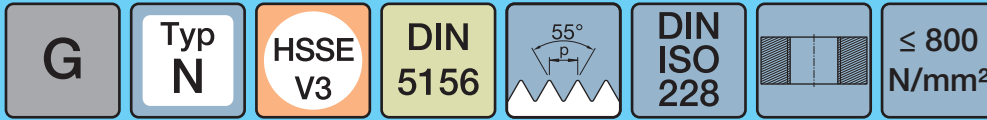
HSSE-V3



| | | | | | |
|--|--|-------------------------------|--|--|-------------------------------|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | 374 201 ¹²⁰ | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | 374 241 ⁴²⁰ |
| Catalogue n° ^{W%} | Nr. di catalogo ^{W%} | GG-Ni-OX | Catalogue n° ^{W%} | Nr. di catalogo ^{W%} | GG-TiCN |

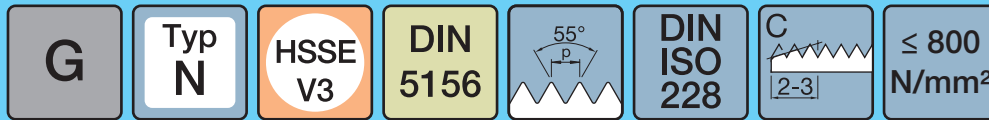
| | | | | | |
|---|--|---|---|--|---|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 2; 3.2; 3.5; 3.6; 4.4; 4.5; 7.2; 7.3 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 2; 3.2; 3.5; 3.6; 4.4; 4.5; 7.2; 7.3 |
|---|--|---|---|--|---|

| d₁ [mm] | P [mm] | l₁ [mm] | l₂ [mm] | d₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
|------------------------------|------------------|------------------------------|------------------------------|------------------------------|------------------|------------------|----------|------------------|-----------------|
| M 4 x 0,5 | 63 | 10 | 2,8 | 5 | 2,1 | 3 | 3,5 | 061 402 | |
| M 5 x 0,5 | 70 | 12 | 3,5 | 6 | 2,7 | 3 | 4,5 | 061 403 | |
| M 6 x 0,5 | 80 | 14 | 4,5 | 6 | 3,4 | 3 | 5,5 | 061 404 | |
| M 6 x 0,75 | 80 | 14 | 4,5 | 6 | 3,4 | 4 | 5,3 | 061 405 | |
| M 8 x 0,75 | 80 | 18 | 6 | 8 | 4,9 | 4 | 7,3 | 061 406 | |
| M 8 x 1 | 90 | 22 | 6 | 8 | 4,9 | 4 | 7 | 061 407 | |
| M 10 x 1 | 90 | 20 | 7 | 8 | 5,5 | 4 | 9 | 061 408 | |
| M 12 x 1 | 100 | 22 | 9 | 10 | 7 | 4 | 11 | 061 409 | |
| M 12 x 1,5 | 100 | 22 | 9 | 10 | 7 | 4 | 10,5 | 061 410 | |
| M 14 x 1,5 | 100 | 22 | 11 | 12 | 9 | 4 | 12,5 | 061 411 | |
| M 16 x 1,5 | 100 | 22 | 12 | 12 | 9 | 4 | 14,5 | 061 412 | |
| M 18 x 1,5 | 110 | 25 | 14 | 14 | 11 | 4 | 16,5 | 061 413 | |
| M 20 x 1,5 | 125 | 25 | 16 | 15 | 12 | 4 | 18,5 | 061 414 | |
| M 22 x 1,5 | 125 | 25 | 18 | 17 | 14,5 | 4 | 20,5 | 061 415 | |
| M 24 x 1,5 | 140 | 28 | 18 | 17 | 14,5 | 4 | 22,5 | 061 416 | |



| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 980 100 ¹²⁰ - | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 980 200 ¹²⁰ - | | | | | | | | | | | | | | |
|--|--|---|--|--|---|------|---|-------|--------------|------------------------|------------------------|------------------------|------------------------|----|----|-----|------|-------|---------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | | | | | |
| P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | □ | z | ∅ | Code | P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | □ | z | ∅ | Code | | |
| G 1/8 | 28 | 9,73 | 90 | 20 | 7 | 5,5 | 3 | 8,8 | 061 175 | G 1/8 | 28 | 9,73 | 90 | 20 | 7 | 5,5 | 3 | 8,8 | 061 160 |
| G 1/4 | 19 | 13,16 | 100 | 22 | 11 | 9 | 3 | 11,8 | 061 176 | G 1/4 | 19 | 13,16 | 100 | 22 | 11 | 9 | 3 | 11,8 | 061 161 |
| G 3/8 | 19 | 16,66 | 100 | 22 | 12 | 9 | 3 | 15,25 | 061 177 | G 3/8 | 19 | 16,66 | 100 | 22 | 12 | 9 | 3 | 15,25 | 061 162 |
| G 1/2 | 14 | 20,96 | 125 | 25 | 16 | 12 | 4 | 19 | 061 178 | G 1/2 | 14 | 20,96 | 125 | 25 | 16 | 12 | 4 | 19 | 061 163 |
| G 5/8 | 14 | 22,91 | 125 | 25 | 18 | 14,5 | 4 | 21 | 061 179 | G 3/4 | 14 | 26,44 | 140 | 28 | 20 | 16 | 4 | 24,5 | 061 165 |
| G 3/4 | 14 | 26,44 | 140 | 28 | 20 | 16 | 4 | 24,5 | 061 180 | G 1 | 11 | 33,25 | 160 | 30 | 25 | 20 | 4 | 30,75 | 061 167 |
| G 7/8 | 14 | 30,2 | 150 | 28 | 22 | 18 | 4 | 28,25 | 061 181 | | | | | | | | | | |
| G 1 | 11 | 33,25 | 160 | 30 | 25 | 20 | 4 | 30,75 | 061 182 | | | | | | | | | | |
| G 1 1/8 | 11 | 37,9 | 170 | 30 | 28 | 22 | 4 | 35,3 | 061 195 | | | | | | | | | | |
| G 1 1/4 | 11 | 41,91 | 170 | 30 | 32 | 24 | 4 | 39,25 | 061 196 | | | | | | | | | | |
| G 1 3/8 | 11 | 44,32 | 180 | 32 | 36 | 29 | 6 | 42 | 061 197 | | | | | | | | | | |
| G 1 1/2 | 11 | 47,8 | 190 | 32 | 36 | 29 | 6 | 45,25 | 061 198 | | | | | | | | | | |





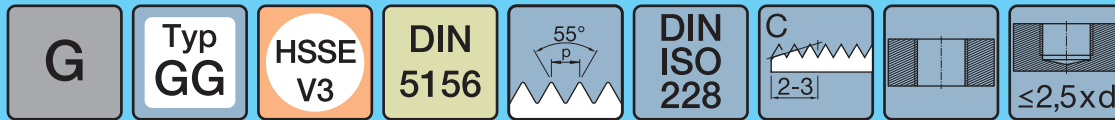
| G | HSSE-V3 | | | | | | | | | | | | | | | | | | |
|---|---------|--|--|---|--|--|-----------------------------|--|---------|---|----|-------|-----|----|----|------|---|-------|---------|
| | | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 980 150 ¹²⁰ - | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 980 300 ¹²⁰ - | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | |
| P d ₁ l ₁ l ₂ d ₂ □ z Ø | | Code | | P d ₁ l ₁ l ₂ d ₂ □ z Ø | | Code | | | | | | | | | | | | | |
| [Gg/1"] [mm] [mm] [mm] [mm] [mm] [mm] | | [mm] | | [Gg/1"] [mm] [mm] [mm] [mm] [mm] [mm] | | [mm] | | | | | | | | | | | | | |
| G 1/8 | 28 | 9,73 | 90 | 16 | 7 | 5,5 | 3 | 8,8 | 061 184 | G 1/8 | 28 | 9,73 | 90 | 16 | 7 | 5,5 | 3 | 8,8 | 061 200 |
| G 1/4 | 19 | 13,16 | 100 | 20 | 11 | 9 | 3 | 11,8 | 061 185 | G 1/4 | 19 | 13,16 | 100 | 20 | 11 | 9 | 3 | 11,8 | 061 201 |
| G 3/8 | 19 | 16,66 | 100 | 22 | 12 | 9 | 3 | 15,25 | 061 186 | G 3/8 | 19 | 16,66 | 100 | 22 | 12 | 9 | 3 | 15,25 | 061 202 |
| G 1/2 | 14 | 20,96 | 125 | 25 | 16 | 12 | 4 | 19 | 061 187 | G 1/2 | 14 | 20,96 | 125 | 25 | 16 | 12 | 4 | 19 | 061 203 |
| G 5/8 | 14 | 22,91 | 125 | 25 | 18 | 14,5 | 4 | 21 | 061 188 | G 5/8 | 14 | 22,91 | 125 | 25 | 18 | 14,5 | 4 | 21 | 061 204 |
| G 3/4 | 14 | 26,44 | 140 | 28 | 20 | 16 | 4 | 24,5 | 061 189 | G 3/4 | 14 | 26,44 | 140 | 28 | 20 | 16 | 4 | 24,5 | 061 205 |
| G 7/8 | 14 | 30,2 | 150 | 28 | 22 | 18 | 4 | 28,25 | 061 190 | G 7/8 | 14 | 30,2 | 150 | 28 | 22 | 18 | 4 | 28,25 | 061 206 |
| G 1 | 11 | 33,25 | 160 | 30 | 25 | 20 | 4 | 30,75 | 061 192 | G 1 | 11 | 33,25 | 160 | 30 | 25 | 20 | 4 | 30,75 | 061 207 |
| | | | | | | | | | | G 1 1/8 | 11 | 37,9 | 170 | 30 | 28 | 22 | 4 | 35,3 | 061 208 |
| | | | | | | | | | | G 1 1/4 | 11 | 41,91 | 170 | 30 | 32 | 24 | 6 | 39,25 | 061 209 |
| | | | | | | | | | | G 1 3/8 | 11 | 44,32 | 180 | 32 | 36 | 29 | 6 | 41,9 | 061 210 |
| | | | | | | | | | | G 1 1/2 | 11 | 47,8 | 190 | 32 | 36 | 29 | 6 | 45,25 | 061 211 |



| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 980 103 ¹³⁰ VA-OX | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 980 303 ¹³⁰ VA-OX | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|------|---|--------------|------------------------|------------------------|------------------------|------------------------|----|----|------|----------|-------|---------|---------|----|-------|-----|----|----|------|---|-------|---------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | | | | | | | | | | | | | | | | | | | | | | | |
| P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | □ | z | ∅ | P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | □ | z | ∅ | Code | | | | | | | | | | | | |
| G 1/8 | 28 | 9,73 | 90 | 20 | 7 | 5,5 | 3 | 8,8 | G 1/8 | 28 | 9,73 | 90 | 11 | 7 | 5,5 | 4 | 8,8 | 030 220 | G 1/8 | 28 | 9,73 | 90 | 11 | 7 | 5,5 | 4 | 8,8 | 030 240 |
| G 1/4 | 19 | 13,16 | 100 | 22 | 11 | 9 | 3 | 11,8 | G 1/4 | 19 | 13,16 | 100 | 16 | 11 | 9 | 4 | 11,8 | 030 221 | G 1/4 | 19 | 13,16 | 100 | 16 | 11 | 9 | 4 | 11,8 | 030 241 |
| G 3/8 | 19 | 16,66 | 100 | 22 | 12 | 9 | 3 | 15,25 | G 3/8 | 19 | 16,66 | 100 | 16 | 12 | 9 | 5 | 15,25 | 030 222 | G 3/8 | 19 | 16,66 | 100 | 16 | 12 | 9 | 5 | 15,25 | 030 242 |
| G 1/2 | 14 | 20,96 | 125 | 25 | 16 | 12 | 3 | 19 | G 1/2 | 14 | 20,96 | 125 | 22 | 16 | 12 | 5 | 19 | 030 223 | G 1/2 | 14 | 20,96 | 125 | 22 | 16 | 12 | 5 | 19 | 030 243 |
| G 5/8 | 14 | 22,91 | 125 | 25 | 18 | 14,5 | 4 | 21 | G 5/8 | 14 | 22,91 | 125 | 22 | 18 | 14,5 | 5 | 21 | 030 224 | G 5/8 | 14 | 22,91 | 125 | 22 | 18 | 14,5 | 5 | 21 | 030 244 |
| G 3/4 | 14 | 26,44 | 140 | 28 | 20 | 16 | 4 | 24,5 | G 3/4 | 14 | 26,44 | 140 | 22 | 20 | 16 | 5 | 24,5 | 030 225 | G 3/4 | 14 | 26,44 | 140 | 22 | 20 | 16 | 5 | 24,5 | 030 245 |
| G 7/8 | 14 | 30,2 | 150 | 28 | 22 | 18 | 4 | 28,25 | G 7/8 | 14 | 30,2 | 150 | 22 | 22 | 18 | 5 | 28,25 | 030 226 | G 7/8 | 14 | 30,2 | 150 | 22 | 22 | 18 | 5 | 28,25 | 030 246 |
| G 1 | 11 | 33,25 | 160 | 30 | 25 | 20 | 4 | 30,75 | G 1 | 11 | 33,25 | 160 | 28 | 25 | 20 | 5 | 30,75 | 030 227 | G 1 | 11 | 33,25 | 160 | 28 | 25 | 20 | 5 | 30,75 | 030 247 |
| | | | | | | | | | G 1 1/8 | 11 | 37,9 | 170 | 30 | 28 | 22 | 5 | 35,3 | | G 1 1/8 | 11 | 37,9 | 170 | 30 | 28 | 22 | 5 | 35,3 | 030 248 |
| | | | | | | | | | G 1 1/4 | 11 | 41,91 | 170 | 30 | 32 | 24 | 6 | 39,25 | | G 1 1/4 | 11 | 41,91 | 170 | 30 | 32 | 24 | 6 | 39,25 | 030 249 |
| | | | | | | | | | G 1 3/8 | 11 | 44,32 | 180 | 32 | 36 | 29 | 6 | 41,9 | | G 1 3/8 | 11 | 44,32 | 180 | 32 | 36 | 29 | 6 | 41,9 | 030 250 |
| | | | | | | | | | G 1 1/2 | 11 | 47,8 | 190 | 32 | 36 | 29 | 6 | 45,25 | | G 1 1/2 | 11 | 47,8 | 190 | 32 | 36 | 29 | 6 | 45,25 | 030 251 |

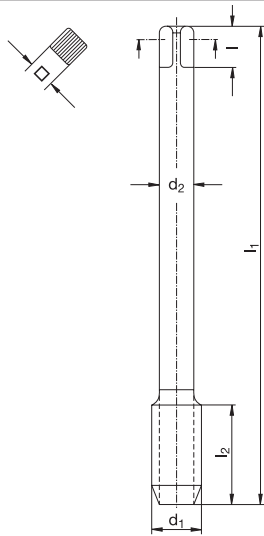
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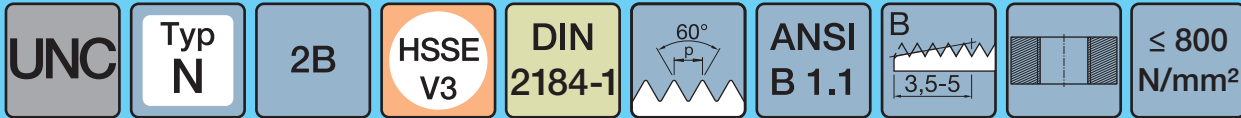


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V3



| | | |
|--|---|---|
| Katalog-Nr. ^{W%} | Catalogue no. ^{W%} | 980 201 ¹²⁰ |
| Catalogue n° ^{W%} | Nr. di catalogo ^{W%} | GG-Ni-OX |
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 2; 3.2; 3.5; 3.6; 4.4; 4.5; 7.2; 7.3 |
| P [Gg/1"] | d₁ [mm] | l₁ [mm] |
| d₂ [mm] | l₂ [mm] | z [mm] |
| ∅ [mm] | Code | |
| G 1/8 | 28 | 9,73 |
| G 1/4 | 19 | 13,16 |
| G 3/8 | 19 | 16,66 |
| G 1/2 | 14 | 20,96 |
| G 3/4 | 14 | 26,44 |
| G 1 | 11 | 33,25 |

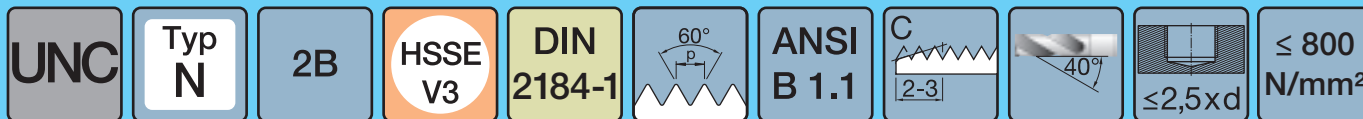


| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 920 100 ¹²⁰ - | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 921 100 ¹²⁰ - | | | | | | | | | | | | | |
|--|--|---|--|--|---|-----|---|------|---------|-------------------|------------------------|------------------------|------------------------|------------------------|------|---|-------|---------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | | | | |
| P [Gg/1"] [mm] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | □ | z | Ø | Code | P [Gg/1"] [mm] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | □ | z | Ø | Code |
| # 1-64 | 1,85 | 50 | 8 | 9 | 2,8 | 2,1 | 2 | 1,55 | 061 226 | 7/16-14 | 11,11 | 100 | 24 | 8 | 6,2 | 3 | 9,4 | 061 238 |
| # 2-56 | 2,18 | 50 | 9 | 10 | 2,8 | 2,1 | 2 | 1,85 | 061 227 | 1/2-13 | 12,70 | 110 | 29 | 9 | 7 | 3 | 10,8 | 061 239 |
| # 3-48 | 2,52 | 50 | 9 | 10 | 2,8 | 2,1 | 2 | 2,1 | 061 228 | 9/16-12 | 14,29 | 110 | 30 | 11 | 9 | 3 | 12,25 | 061 240 |
| # 4-40 | 2,85 | 56 | 11 | 18 | 3,5 | 2,7 | 2 | 2,35 | 061 229 | 5/8-11 | 15,88 | 110 | 32 | 12 | 9 | 3 | 13,5 | 061 241 |
| # 5-40 | 3,18 | 56 | 11 | 18 | 3,5 | 2,7 | 3 | 2,65 | 061 230 | 3/4-10 | 19,05 | 125 | 34 | 14 | 11 | 3 | 16,5 | 061 242 |
| # 6-32 | 3,51 | 56 | 13 | 19 | 4 | 3 | 3 | 2,85 | 061 231 | 7/8-9 | 22,23 | 140 | 34 | 18 | 14,5 | 3 | 19,5 | 061 243 |
| # 8-32 | 4,17 | 63 | 13 | 19 | 4,5 | 3,4 | 3 | 3,5 | 061 232 | 1-8 | 25,4 | 160 | 38 | 18 | 14,5 | 3 | 22,25 | 061 244 |
| # 10-24 | 4,83 | 70 | 16 | 20 | 6 | 4,9 | 3 | 3,9 | 061 233 | | | | | | | | | |
| # 12-24 | 5,49 | 80 | 17 | 29 | 6 | 4,9 | 3 | 4,5 | 061 234 | | | | | | | | | |
| 1/4-20 | 6,35 | 80 | 19 | 30 | 7 | 5,5 | 3 | 5,2 | 061 235 | | | | | | | | | |
| 5/16-18 | 7,94 | 90 | 22 | 34 | 8 | 6,2 | 3 | 6,6 | 061 236 | | | | | | | | | |
| 3/8-16 | 9,53 | 100 | 24 | 35 | 10 | 8 | 3 | 8 | 061 237 | | | | | | | | | |

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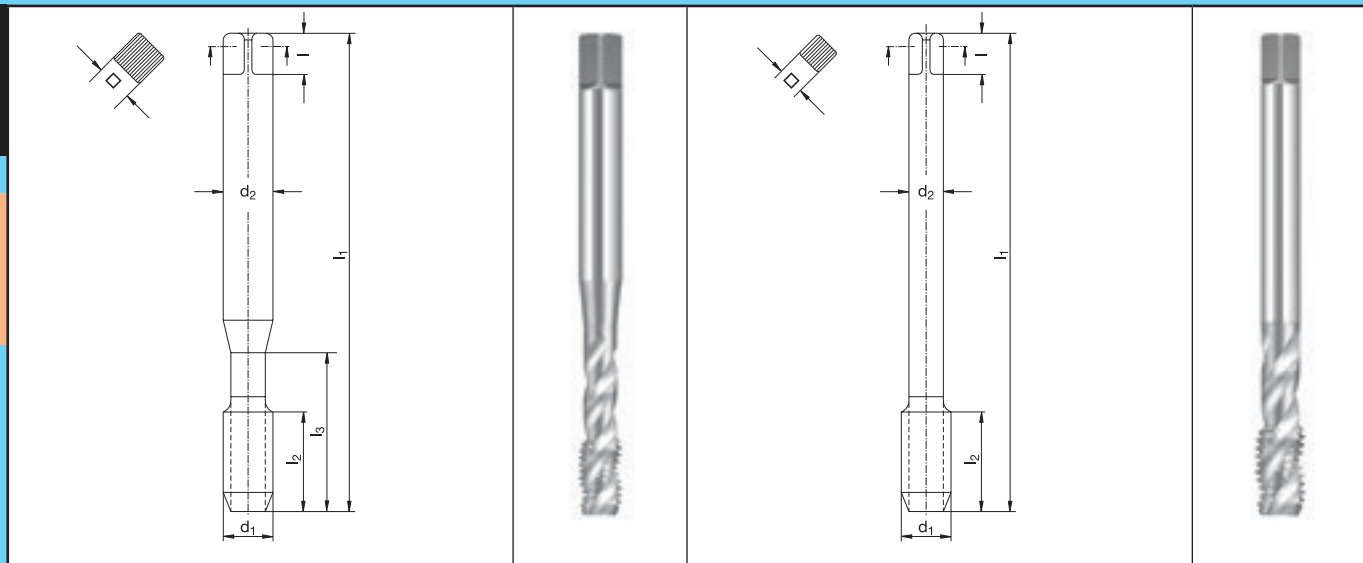
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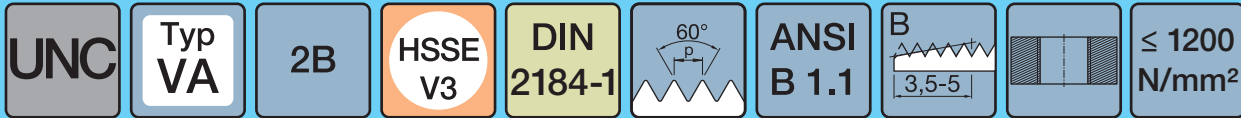


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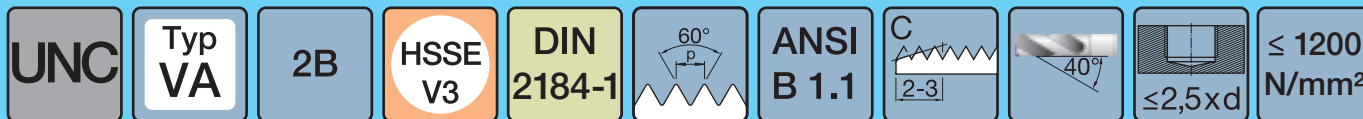
| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 920 300 ¹²⁰ - | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 921 300 ¹²⁰ - | | | | | | | | | | | | | | |
|--|--|---|--|--|---|-----|---|------|---|--------------|------------------------|------------------------|------------------------|------------------------|------|---|-------|---|---------|
| Werkstoffgruppen Groupes de matières | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | Werkstoffgruppen Groupes de matières | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | | | | | |
| P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | □ | z | ∅ | ∅ | P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | □ | z | ∅ | ∅ | Code |
| # 2-56 | 2,18 | 50 | 9 | 10 | 2,8 | 2,1 | 2 | 1,85 | | 7/16-14 | 11,11 | 100 | 22 | 8 | 6,2 | 3 | 9,4 | | 061 252 |
| # 3-48 | 2,52 | 50 | 9 | 10 | 2,8 | 2,1 | 2 | 2,1 | | 1/2-13 | 12,70 | 110 | 23 | 9 | 7 | 3 | 10,8 | | 061 253 |
| # 4-40 | 2,85 | 56 | 11 | 18 | 3,5 | 2,7 | 2 | 2,35 | | 9/16-12 | 14,29 | 110 | 25 | 11 | 9 | 3 | 12,25 | | 061 254 |
| # 5-40 | 3,18 | 56 | 7 | 18 | 3,5 | 2,7 | 3 | 2,65 | | 5/8-11 | 15,88 | 110 | 28 | 12 | 9 | 3 | 13,5 | | 061 255 |
| # 6-32 | 3,51 | 56 | 8 | 19 | 4 | 3 | 3 | 2,85 | | 3/4-10 | 19,05 | 125 | 30 | 14 | 11 | 4 | 16,5 | | 061 256 |
| # 8-32 | 4,17 | 63 | 8 | 19 | 4,5 | 3,4 | 3 | 3,5 | | 7/8-9 | 22,23 | 140 | 34 | 18 | 14,5 | 4 | 19,5 | | 061 257 |
| # 10-24 | 4,83 | 70 | 11 | 20 | 6 | 4,9 | 3 | 3,9 | | 1-8 | 25,40 | 160 | 38 | 18 | 14,5 | 4 | 22,25 | | 061 258 |
| # 12-24 | 5,49 | 80 | 11 | 29 | 6 | 4,9 | 3 | 4,5 | | | | | | | | | | | 061 259 |
| 1/4-20 | 6,35 | 80 | 13 | 30 | 7 | 5,5 | 3 | 5,2 | | | | | | | | | | | 061 260 |
| 5/16-18 | 7,94 | 90 | 15 | 34 | 8 | 6,2 | 3 | 6,6 | | | | | | | | | | | 061 261 |
| 3/8-16 | 9,53 | 100 | 15 | 35 | 10 | 8 | 3 | 8 | | | | | | | | | | | 061 262 |



| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 920 103 ¹³⁰ VA-OX | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 921 103 ¹³⁰ VA-OX | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|-----|---|------|--------------|------------------------|------------------------|------------------------|------------------------|------|---|-------|----------|--------------|------------------------|------------------------|------------------------|------------------------|------|---|------|----------|
| Werkstoffgruppen Groupes de matières | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | Werkstoffgruppen Groupes de matières | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | | | | | | | | | | | | | | | | | | | | | |
| P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | □ | z | Ø | P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | □ | z | Ø | Code | P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | □ | z | Ø | Code |
| # 4-40 | 2,85 | 56 | 11 | 18 | 3,5 | 2,7 | 2 | 2,35 | 1/2-13 | 12,70 | 110 | 29 | 9 | 7 | 3 | 10,8 | 031 229 | 5/8-11 | 15,88 | 110 | 32 | 12 | 9 | 3 | 13,5 | 031 239 |
| # 5-40 | 3,18 | 56 | 11 | 18 | 3,5 | 2,7 | 3 | 2,65 | 3/4-10 | 19,05 | 125 | 34 | 14 | 11 | 3 | 16,5 | 031 230 | 7/8-9 | 22,23 | 140 | 34 | 18 | 14,5 | 3 | 19,5 | 031 241 |
| # 6-32 | 3,51 | 56 | 13 | 20 | 4 | 3 | 3 | 2,85 | 1-8 | 25,40 | 160 | 38 | 18 | 14,5 | 3 | 22,25 | 031 231 | | | | | | | | | 031 242 |
| # 8-32 | 4,17 | 63 | 13 | 19 | 4,5 | 3,4 | 3 | 3,5 | | | | | | | | | 031 232 | | | | | | | | | 031 243 |
| # 10-24 | 4,83 | 70 | 16 | 20 | 6 | 4,9 | 3 | 3,9 | | | | | | | | | 031 233 | | | | | | | | | 031 244 |
| 1/4-20 | 6,35 | 80 | 19 | 30 | 7 | 5,5 | 3 | 5,2 | | | | | | | | | 031 235 | | | | | | | | | |
| 5/16-18 | 7,94 | 90 | 22 | 34 | 8 | 6,2 | 3 | 6,6 | | | | | | | | | 031 236 | | | | | | | | | |
| 3/8-16 | 9,53 | 100 | 24 | 35 | 10 | 8 | 3 | 8 | | | | | | | | | 031 237 | | | | | | | | | |

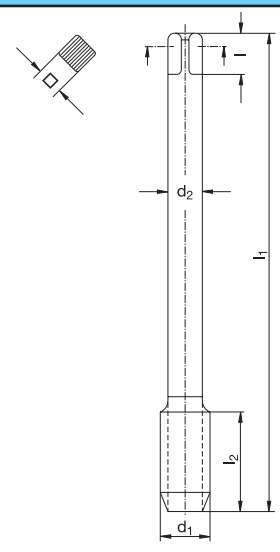
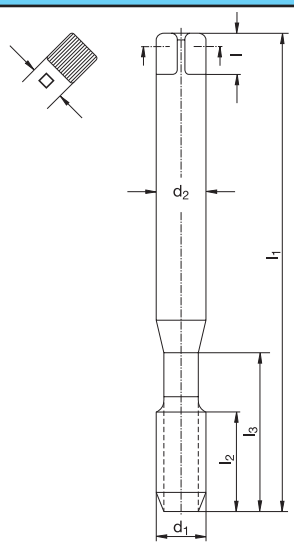
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| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 920 303 ¹³⁰ VA-OX | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 921 303 ¹³⁰ VA-OX | | | | |
|--|--|--|--|--|--|-----|-------|---------|---------|
| Werkstoffgruppen Groupes de matières | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | Werkstoffgruppen Groupes de matières | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | | | | |
| P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | □ | z | ∅ | ∅ |
| # 6-32 | 3,51 | 56 | 8 | 19 | 4 | 3 | 3 | 2,85 | 031 256 |
| # 8-32 | 4,17 | 63 | 8 | 19 | 4,5 | 3,4 | 3 | 3,5 | 031 257 |
| # 10-24 | 4,83 | 70 | 11 | 20 | 6 | 4,9 | 3 | 3,9 | 031 258 |
| 1/4-20 | 6,35 | 80 | 13 | 30 | 7 | 5,5 | 3 | 5,2 | 031 260 |
| 5/16-18 | 7,94 | 90 | 15 | 35 | 8 | 6,2 | 3 | 6,6 | 031 261 |
| 3/8-16 | 9,53 | 100 | 15 | 35 | 10 | 8 | 3 | 8 | 031 262 |
| 1/2-13 | 12,70 | 110 | 23 | 9 | 7 | 4 | 10,8 | 031 264 | |
| 5/8-11 | 15,88 | 110 | 28 | 12 | 9 | 4 | 13,5 | 031 266 | |
| 3/4-10 | 19,05 | 125 | 30 | 14 | 11 | 4 | 16,5 | 031 267 | |
| 7/8-9 | 22,23 | 140 | 34 | 18 | 14,5 | 4 | 19,5 | 031 268 | |
| 1-8 | 25,40 | 160 | 38 | 18 | 14,5 | 5 | 22,25 | 031 269 | |



| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 930 100 ¹²⁰ - | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 930 300 ¹²⁰ - | | | | | | | | | | | | |
|--|--|---|--|--|---|---|-------|---------|--------------|------------------------|------------------------|------------------------|------------------------|------|---|-------|---------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | | | | | | | |
| P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | □ | z | ∅ | Code | P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | □ | z | ∅ | Code |
| # 0-80 | 1,52 | 40 | 8 | 1,2 | - | 2 | 1,25 | 061 271 | # 3-56 | 2,52 | 50 | 7 | 1,8 | - | 2 | 2,15 | 061 296 |
| # 1-72 | 1,85 | 50 | 8 | 1,4 | - | 2 | 1,55 | 061 272 | # 4-48 | 2,85 | 56 | 7 | 2,2 | - | 2 | 2,4 | 061 297 |
| # 2-64 | 2,18 | 50 | 9 | 1,6 | - | 2 | 1,85 | 061 273 | # 5-44 | 3,18 | 56 | 7 | 2,2 | - | 3 | 2,7 | 061 298 |
| # 3-56 | 2,52 | 50 | 9 | 1,8 | - | 2 | 2,15 | 061 274 | # 6-40 | 3,51 | 56 | 7 | 2,5 | 2,1 | 3 | 3,0 | 061 299 |
| # 4-48 | 2,85 | 56 | 11 | 2,2 | - | 2 | 2,4 | 061 275 | # 8-36 | 4,17 | 63 | 7 | 2,8 | 2,1 | 3 | 3,5 | 061 300 |
| # 5-44 | 3,18 | 56 | 11 | 2,2 | - | 3 | 2,7 | 061 276 | # 10-32 | 4,83 | 70 | 9 | 3,5 | 2,7 | 3 | 4,1 | 061 301 |
| # 6-40 | 3,51 | 56 | 13 | 2,5 | 2,1 | 3 | 2,95 | 061 277 | # 12-28 | 5,49 | 80 | 9 | 4 | 3 | 3 | 4,6 | 061 302 |
| # 8-36 | 4,17 | 63 | 13 | 2,8 | 2,1 | 3 | 3,5 | 061 278 | 1/4-28 | 6,35 | 80 | 11 | 4,5 | 3,4 | 3 | 5,5 | 061 303 |
| # 10-32 | 4,83 | 70 | 16 | 3,5 | 2,7 | 3 | 4,1 | 061 279 | 5/16-24 | 7,94 | 90 | 12 | 6 | 4,9 | 3 | 6,9 | 061 304 |
| # 12-28 | 5,49 | 80 | 17 | 4 | 3 | 3 | 4,6 | 061 280 | 3/8-24 | 9,53 | 90 | 13 | 7 | 5,5 | 3 | 8,5 | 061 305 |
| 1/4-28 | 6,35 | 80 | 19 | 4,5 | 3,4 | 3 | 5,5 | 061 281 | 7/16-20 | 11,11 | 100 | 15 | 8 | 6,2 | 3 | 9,9 | 061 306 |
| 5/16-24 | 7,94 | 90 | 22 | 6 | 4,9 | 3 | 6,9 | 061 282 | 1/2-20 | 12,70 | 100 | 16 | 9 | 7 | 3 | 11,5 | 061 307 |
| 3/8-24 | 9,53 | 90 | 22 | 7 | 5,5 | 3 | 8,5 | 061 283 | 9/16-18 | 14,29 | 100 | 17 | 11 | 9 | 3 | 12,9 | 061 308 |
| 7/16-20 | 11,11 | 100 | 24 | 8 | 6,2 | 3 | 9,9 | 061 284 | 5/8-18 | 15,88 | 100 | 19 | 12 | 9 | 3 | 14,5 | 061 309 |
| 1/2-20 | 12,70 | 100 | 22 | 9 | 7 | 3 | 11,5 | 061 285 | 3/4-16 | 19,05 | 110 | 21 | 14 | 11 | 4 | 17,5 | 061 310 |
| 9/16-18 | 14,29 | 100 | 22 | 11 | 9 | 3 | 12,9 | 061 286 | 7/8-14 | 22,23 | 125 | 23 | 18 | 14,5 | 4 | 20,4 | 061 311 |
| 5/8-18 | 15,88 | 100 | 22 | 12 | 9 | 3 | 14,5 | 061 287 | 1-12 | 25,40 | 125 | 25 | 18 | 14,5 | 4 | 23,25 | 061 312 |
| 3/4-16 | 19,05 | 110 | 25 | 14 | 11 | 3 | 17,5 | 061 288 | | | | | | | | | |
| 7/8-14 | 22,23 | 125 | 25 | 18 | 14,5 | 3 | 20,4 | 061 289 | | | | | | | | | |
| 1-12 | 25,40 | 125 | 25 | 18 | 14,5 | 3 | 23,25 | 061 290 | | | | | | | | | |
| 1 1/8-12 | 28,58 | 150 | 28 | 22 | 18 | 4 | 26,5 | 061 291 | | | | | | | | | |
| 1 1/4-12 | 31,75 | 150 | 28 | 22 | 18 | 4 | 29,5 | 061 292 | | | | | | | | | |
| 1 3/8-12 | 34,93 | 170 | 30 | 28 | 22 | 4 | 32,75 | 061 293 | | | | | | | | | |
| 1 1/2-12 | 38,10 | 170 | 30 | 32 | 24 | 4 | 36 | 061 294 | | | | | | | | | |

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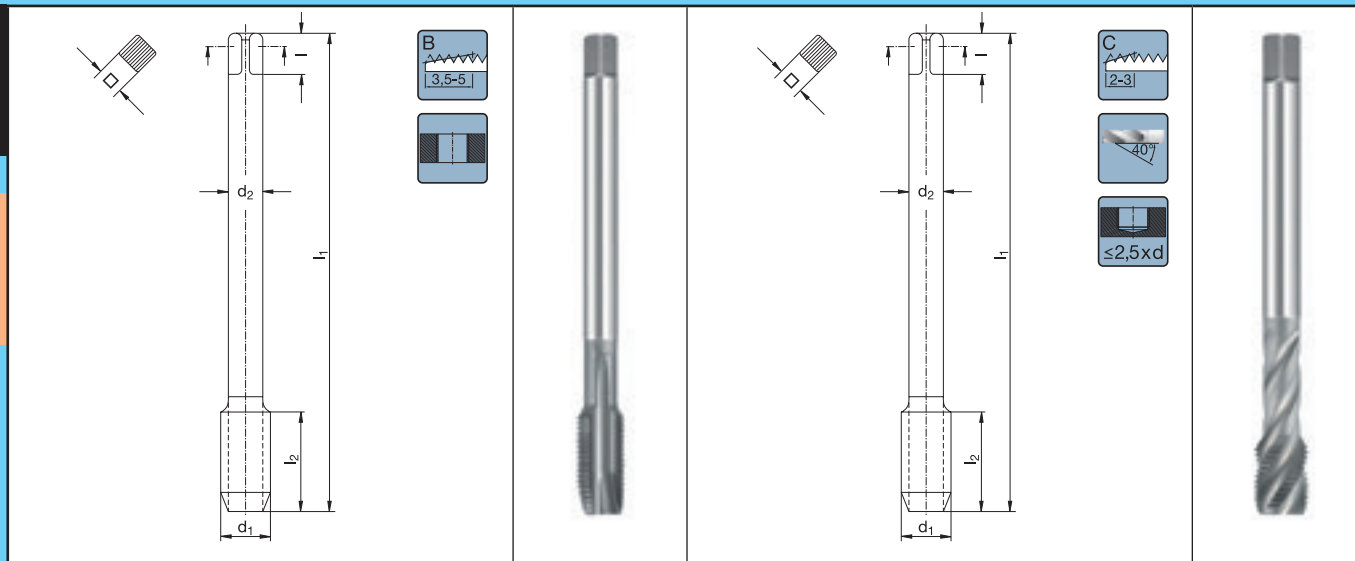
HSSE-
V3



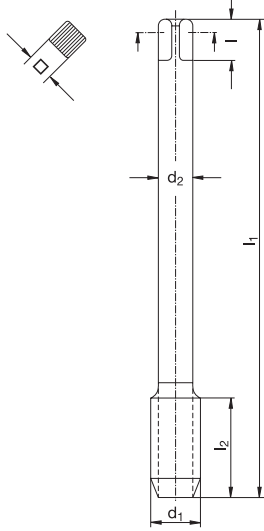
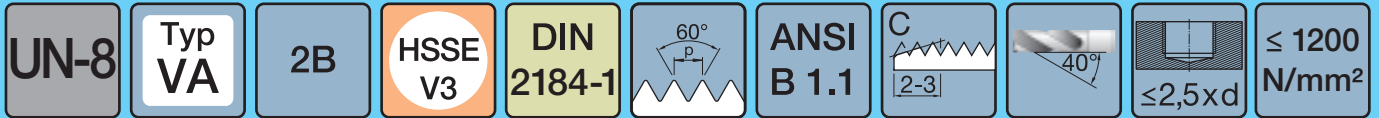


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HSSE-V3



| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 930 103 ¹³⁰ VA-OX | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 930 303 ¹³⁰ VA-OX | | | | | | | | | | | | |
|---|--|--|---|--|--|---|-----------|----------|--------------|------------------------|------------------------|------------------------|------------------------|------|---|-----------|----------|
| Werkstoffgruppen Groupes de matières | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | Werkstoffgruppen Groupes de matières | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | | | | | | | | | | | | |
| P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | □ | z | Ø [mm] | Code | P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | □ | z | Ø [mm] | Code |
| # 6-40 | 3,51 | 56 | 13 | 2,5 | 2,1 | 3 | 3 | 031 277 | # 6-40 | 3,51 | 56 | 7 | 2,5 | 2,1 | 3 | 3 | 031 299 |
| # 10-32 | 4,83 | 70 | 16 | 3,5 | 2,7 | 3 | 4,1 | 031 279 | # 10-32 | 4,83 | 70 | 9 | 3,5 | 2,7 | 3 | 4,1 | 031 301 |
| 1/4-28 | 6,35 | 80 | 19 | 4,5 | 3,4 | 3 | 5,5 | 031 281 | 1/4-28 | 6,35 | 80 | 11 | 4,5 | 3,4 | 3 | 5,5 | 031 303 |
| 5/16-24 | 7,94 | 90 | 22 | 6 | 4,9 | 3 | 6,9 | 031 282 | 5/16-24 | 7,94 | 90 | 12 | 6 | 4,9 | 3 | 6,9 | 031 304 |
| 3/8-24 | 9,53 | 90 | 22 | 7 | 5,5 | 3 | 8,5 | 031 283 | 3/8-24 | 9,53 | 90 | 13 | 7 | 5,5 | 3 | 8,5 | 031 305 |
| 7/16-20 | 11,11 | 100 | 24 | 8 | 6,2 | 3 | 9,9 | 031 284 | 7/16-20 | 11,11 | 100 | 15 | 8 | 6,2 | 4 | 9,9 | 031 306 |
| 1/2-20 | 12,70 | 100 | 22 | 9 | 7 | 3 | 11,5 | 031 285 | 1/2-20 | 12,70 | 100 | 16 | 9 | 7 | 4 | 11,5 | 031 307 |
| 5/8-18 | 15,88 | 100 | 22 | 12 | 9 | 3 | 14,5 | 031 287 | 5/8-18 | 15,88 | 100 | 19 | 12 | 9 | 4 | 14,5 | 031 309 |
| 3/4-16 | 19,05 | 110 | 25 | 14 | 11 | 3 | 17,5 | 031 288 | 3/4-16 | 19,05 | 110 | 21 | 14 | 11 | 4 | 17,5 | 031 310 |
| 7/8-14 | 22,23 | 125 | 25 | 18 | 14,5 | 3 | 20,4 | 031 289 | 7/8-14 | 22,23 | 125 | 23 | 18 | 14,5 | 4 | 20,4 | 031 311 |
| 1-12 | 25,40 | 125 | 25 | 18 | 14,5 | 5 | 23,25 | 031 290 | 1-12 | 25,40 | 125 | 25 | 18 | 14,5 | 5 | 23,25 | 031 312 |

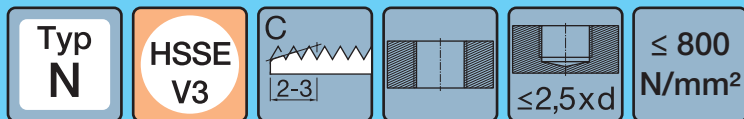


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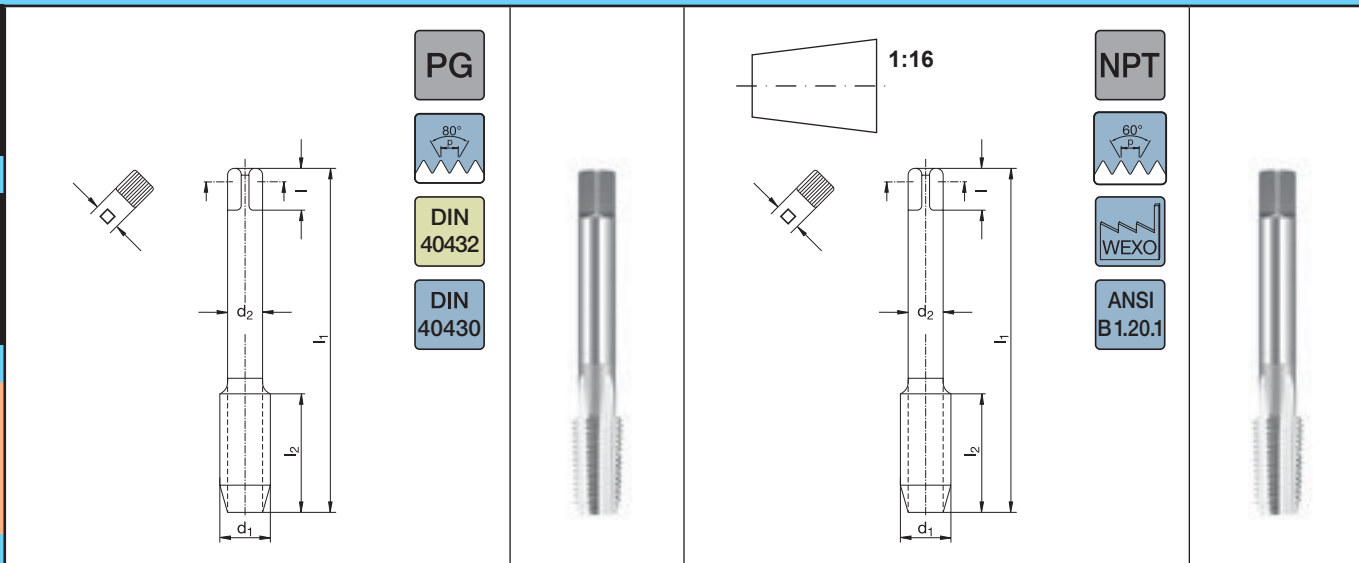
HSSE-
V3

| | | |
|--|---|--|
| Katalog-Nr. ^{W%} | Catalogue no. ^{W%} | 922 303 ¹³⁰ |
| Catalogue n° ^{W%} | Nr. di catalogo ^{W%} | VA-OX |
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 |
| P [Gg/1"] | d₁ [mm] | l₁ [mm] |
| d₂ [mm] | l₂ [mm] | z [mm] |
| ∅ [mm] | Code | |
| 1¹/₈- 8 | 28,57 | 125 |
| 1¹/₄- 8 | 31,75 | 125 |
| 1¹/₂- 8 | 38,10 | 125 |
| 1³/₄- 8 | 44,45 | 125 |
| 2- 8 | 50,80 | 125 |





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NPT
HSSE-V3



| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 910 200 ¹²⁰ | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 901 200 ¹²⁰ | | | | | | | | | | | | |
|---|----|--|-----|---|----|--|---------|---------|------|------|-------|-----|----|----|-----|---|------|---------|
| Catalogue n° ^{W%} Nr. di catalogo ^{W%} | | - | | Catalogue n° ^{W%} Nr. di catalogo ^{W%} | | - | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | | | | | | | | |
| P d ₁ l ₁ l ₂ d ₂ □ z Ø | | Code | | P d ₁ l ₁ l ₂ d ₂ □ z Ø | | Code | | | | | | | | | | | | |
| [Gg/1"] [mm] [mm] [mm] [mm] [mm] [mm] | | [mm] | | [Gg/1"] [mm] [mm] [mm] [mm] [mm] [mm] | | [mm] | | | | | | | | | | | | |
| Pg 7 | 20 | 12,5 | 70 | 22 | 9 | 7 | 4 11,4 | 061 316 | 1/16 | 27 | 7,72 | 56 | 14 | 6 | 4,9 | 4 | 6,4 | 060 001 |
| Pg 9 | 18 | 15,2 | 70 | 22 | 12 | 9 | 4 14 | 061 317 | 1/8 | 27 | 10,07 | 63 | 15 | 7 | 5,5 | 4 | 8,7 | 060 002 |
| Pg 11 | 18 | 18,6 | 80 | 22 | 14 | 11 | 4 17,25 | 061 318 | 1/4 | 18 | 13,37 | 63 | 21 | 11 | 9 | 4 | 11,4 | 060 003 |
| Pg 13,5 | 18 | 20,4 | 80 | 22 | 16 | 12 | 4 19 | 061 319 | 3/8 | 18 | 16,81 | 70 | 21 | 12 | 9 | 4 | 14,7 | 060 004 |
| Pg 16 | 18 | 22,5 | 80 | 22 | 18 | 14,5 | 4 21,25 | 061 320 | 1/2 | 14 | 20,95 | 80 | 27 | 16 | 12 | 4 | 18,3 | 060 005 |
| Pg 21 | 16 | 28,3 | 90 | 22 | 22 | 18 | 4 27 | 061 321 | 3/4 | 14 | 26,29 | 100 | 27 | 20 | 16 | 5 | 23,7 | 060 006 |
| Pg 29 | 16 | 37 | 100 | 25 | 28 | 22 | 6 35,5 | 061 322 | 1 | 11,5 | 32,91 | 110 | 32 | 25 | 20 | 5 | 29,7 | 060 007 |

M Typ UNI 6HX PS 55 60° DIN 13 B 3,5-5 ≤ 1300 N/mm²

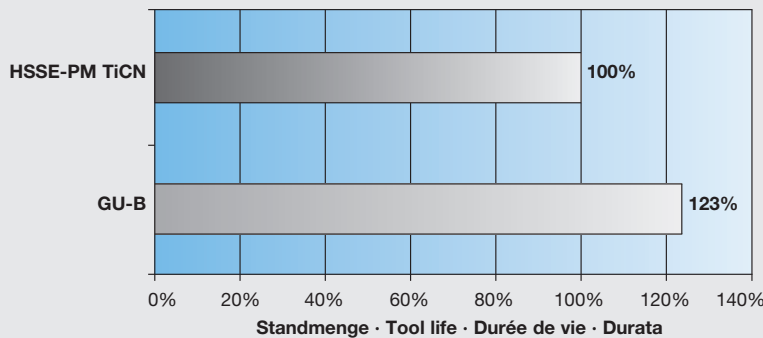
| DIN 371 | | DIN 376 | | | | | | | | | | | | | | | | | | |
|---|--|--|---|--|---|-----------|-----|-----------|------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|------|-----------|------|---------|
| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 571 403 ⁴⁴⁰ GU-B HARDLUBE | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 576 403 ⁴⁴⁰ GU-B HARDLUBE | | | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | Werkstoffgruppen Groupes de matières | | Werkstoffgruppen Groupes de matières | | | | | | | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | Classification of work materials Gruppo materiali | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | |
| 1; 2; 3; 4; 6.1; 6.2; 7 | | 1; 2; 3; 4; 6.1; 6.2; 7 | | 1; 2; 3; 4; 6.1; 6.2; 7 | | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 3 | 1,6 | 433 397 | M 3 | 0,5 | 56 | 11 | 2,2 | - | - | 3 | 2,5 | 433 411 |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 3 | 2,05 | 433 399 | M 4 | 0,7 | 63 | 13 | 2,8 | 6 | 2,1 | 3 | 3,3 | 433 413 |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 433 401 | M 5 | 0,8 | 70 | 16 | 3,5 | 6 | 2,7 | 3 | 4,2 | 433 414 |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 433 403 | M 6 | 1 | 80 | 19 | 4,5 | 8 | 3,4 | 3 | 5 | 433 415 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 433 404 | M 8 | 1,25 | 90 | 22 | 6 | 8 | 4,9 | 3 | 6,8 | 433 416 |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 433 405 | M 10 | 1,5 | 100 | 24 | 7 | 10 | 5,5 | 3 | 8,5 | 433 417 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 433 406 | M 12 | 1,75 | 110 | 28 | 9 | 12 | 7 | 3 | 10,2 | 433 420 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 433 407 | M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 3 | 12 | 433 421 |
| | | | | | | | | | | | M 16 | 2 | 110 | 32 | 12 | 14 | 9 | 3 | 14 | 433 422 |
| | | | | | | | | | | | M 18 | 2,5 | 125 | 34 | 14 | 15 | 11 | 3 | 15,5 | 433 423 |
| | | | | | | | | | | | M 20 | 2,5 | 140 | 34 | 16 | 17 | 12 | 3 | 17,5 | 433 424 |
| | | | | | | | | | | | M 22 | 2,5 | 140 | 34 | 18 | 17 | 14,5 | 3 | 17,5 | 433 425 |
| | | | | | | | | | | | M 24 | 3 | 160 | 38 | 18 | 19 | 14,5 | 3 | 21 | 433 426 |
| | | | | | | | | | | | M 27 | 3 | 160 | 38 | 20 | 21 | 16 | 4 | 24 | 433 427 |
| | | | | | | | | | | | M 30 | 3,5 | 180 | 45 | 22 | 21 | 18 | 4 | 26,5 | 433 428 |

M
PS 55



Einsatzbeispiele · Application examples · Exemple d'utilisation · Esempio di applicazione

| | | |
|--|--|--------------|
| Werkzeugtyp · Tool type Type d'outil · Utensile | GU-B | HSSE-PM TiCN |
| Werkstoff · Work material Pièce à usiner · Materiale | 1.0503 - C 45 (850 N/mm ²) | |
| Gewinde · Thread size Taraudage · Filettatura | M 10 - ISO2 (6H) | |
| Gewindetiefe Thread depth Profondeur de taraudage Profondita' | 15 mm Durchgangsloch · Through hole · Trou débouchant · Passante | |
| V _c | 25 m/min | |
| KSS Coolant lubricant Lubrification Lubrificante | 7% Emulsion · Emulsion · Emulsion · Emulsione | |
| Standmenge · Tool life Durée de vie · Durata | 123% | 100% |

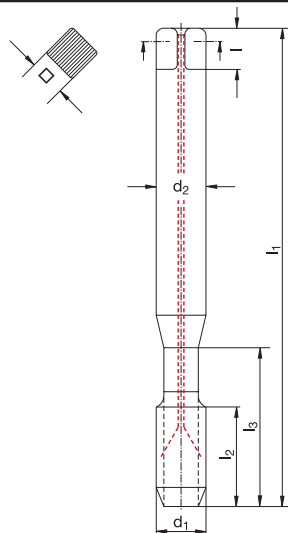


Standmenge · Tool life · Durée de vie · Durata

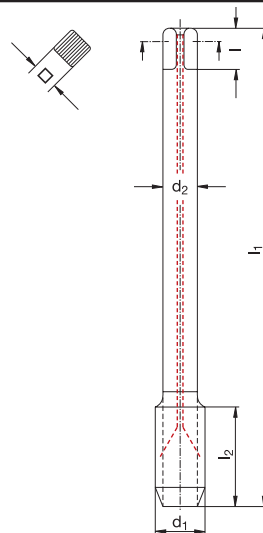
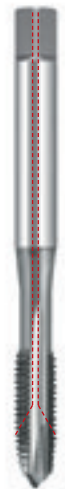
M Typ UNI IKR 6HX PS 55 60° DIN 13 B 3,5-5 ≤ 1300 N/mm²

M

PS 55



DIN 371



DIN 376



Katalog-Nr.^{W%} Catalogue no.^{W%}
Catalogue n^O W% Nr. di catalogo^{W%}

571 437⁴⁴⁰
GU-B HARDLUBE

Katalog-Nr.^{W%} Catalogue no.^{W%}
Catalogue n^O W% Nr. di catalogo^{W%}

576 437⁴⁴⁰
GU-B HARDLUBE

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1; 2; 3; 4; 6.1;
6.2; 7

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1; 2; 3; 4; 6.1;
6.2; 7

d₁ P l₁ l₂ l₃ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

Code

d₁ P l₁ l₂ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

Code

| | | | | | | | | | | |
|------|------|-----|----|----|----|----|-----|---|-----|---------|
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 433 445 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 433 446 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 433 447 |

| | | | | | | | | | |
|------|------|-----|----|----|----|------|---|------|---------|
| M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 433 448 |
| M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 3 | 12 | 433 449 |
| M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 433 450 |
| M 18 | 2,5 | 125 | 34 | 14 | 14 | 11 | 3 | 15,5 | 433 451 |
| M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 4 | 17,5 | 433 452 |
| M 24 | 3 | 168 | 38 | 18 | 17 | 14,5 | 3 | 21 | 433 454 |

M Typ UNI 6GX PS 55 60° DIN 13 B 3,5-5 ≤ 1300 N/mm²

| DIN 371 | | | | | | | | | | | DIN 376 | | | | | | | | | | |
|--|-----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|
| | | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | |
| 571 463 ⁴⁴⁰ | | | | | | | | | | | 576 463 ⁴⁴⁰ | | | | | | | | | | |
| GU-B HARDLUBE | | | | | | | | | | | GU-B HARDLUBE | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | | | | | | | Werkstoffgruppen Groupes de matières | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | | | | | | | | | Classification of work materials Gruppo materiali | | | | | | | | | | |
| 1; 2; 3; 4; 6.1; 6.2; 7 | | | | | | | | | | | 1; 2; 3; 4; 6.1; 6.2; 7 | | | | | | | | | | |
| Code | | | | | | | | | | | Code | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | | |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 433 503 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 433 515 | |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 433 505 | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 433 517 | |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 433 506 | M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | 433 519 | |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 433 507 | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 433 508 | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 433 509 | | | | | | | | | | | |

M
PS 55





M
PS 55

| DIN 371 | | DIN 376 | |
|--|--|--|--|
| | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | 571 703 ⁴⁴⁰ GU-50 HARDLUBE | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | 576 703 ⁴⁴⁰ GU-50 HARDLUBE |
| Werkstoffgruppen Groupes de matières | 1; 2; 3; 4; 6.1; 6.2; 7 | Werkstoffgruppen Groupes de matières | 1; 2; 3; 4; 6.1; 6.2; 7 |
| Classification of work materials Gruppo materiali | | Classification of work materials Gruppo materiali | |
| d₁ [mm] P [mm] l₁ [mm] l₂ [mm] l₃ [mm] d₂ [mm] l [mm] □ [mm] z ∅ [mm] | Code | d₁ [mm] P [mm] l₁ [mm] l₂ [mm] d₂ [mm] l [mm] □ [mm] z ∅ [mm] | Code |
| M 2 0,4 45 8 - 2,8 5 2,1 3 1,6 | 433 697 | M 3 0,5 56 5 2,2 - - 3 2,5 | 433 711 |
| M 2,5 0,45 50 9 - 2,8 5 2,1 3 2,05 | 433 699 | M 4 0,7 63 7 2,8 6 2,1 3 3,3 | 433 713 |
| M 3 0,5 56 5 18 3,5 6 2,7 3 2,5 | 433 701 | M 5 0,8 70 8 3,5 6 2,7 3 4,2 | 433 714 |
| M 4 0,7 63 7 21 4,5 6 3,4 3 3,3 | 433 703 | M 6 1 80 10 4,5 8 3,4 3 5 | 433 715 |
| M 5 0,8 70 8 25 6 8 4,9 3 4,2 | 433 704 | M 8 1,25 90 13 6 8 4,9 3 6,8 | 433 716 |
| M 6 1 80 10 30 6 8 4,9 3 5 | 433 705 | M 10 1,5 100 15 7 10 5,5 3 8,5 | 433 717 |
| M 8 1,25 90 13 35 8 9 6,2 3 6,8 | 433 706 | M 12 1,75 110 18 9 12 7 4 10,2 | 433 720 |
| M 10 1,5 100 15 39 10 11 8 3 8,5 | 433 707 | M 14 2 110 20 11 12 9 4 12 | 433 721 |
| | | M 16 2 110 20 12 14 9 4 14 | 433 722 |
| | | M 18 2,5 125 25 14 15 11 4 15,5 | 433 723 |
| | | M 20 2,5 140 25 16 17 12 4 17,5 | 433 724 |
| | | M 22 2,5 140 25 18 17 14,5 4 19,5 | 433 725 |
| | | M 24 3 160 30 18 19 14,5 4 21 | 433 726 |
| | | M 27 3 160 30 20 21 16 4 24 | 433 727 |
| | | M 30 3,5 180 35 22 21 18 4 26,5 | 433 728 |

Einsatzbeispiele · Application examples · Exemple d'utilisation · Esempio di applicazione

| | | | |
|--|---|--------------|-------|
| Werkzeugtyp · Tool type Type d'outil · Utensile | HSSE-V3 OX | HSSE-V3 TiCN | GU-50 |
| Werkstoff · Work material Pièce à usiner · Materiale | 1.0570 - St52-3 | | |
| Gewinde · Thread size Taraudage · Filettatura | M 12 - 6HX | | |
| Gewindetiefe Thread depth Profondeur de taraudage Profondita' | 30 mm Sackloch · Blind hole Trou borgne · Cieco | | |
| V_c | 20 m/min | | |
| KSS Coolant lubricant Lubrification Lubrificante | 7 % Emulsion · Emulsion · Emulsion · Emulsione | | |
| Standmenge · Tool life Durée de vie · Durata | 100 % | 252 % | 376 % |

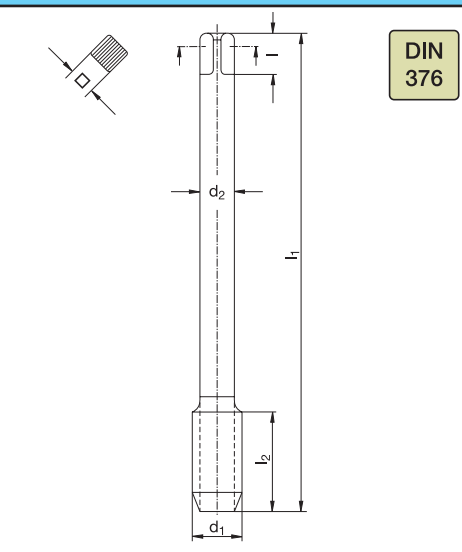
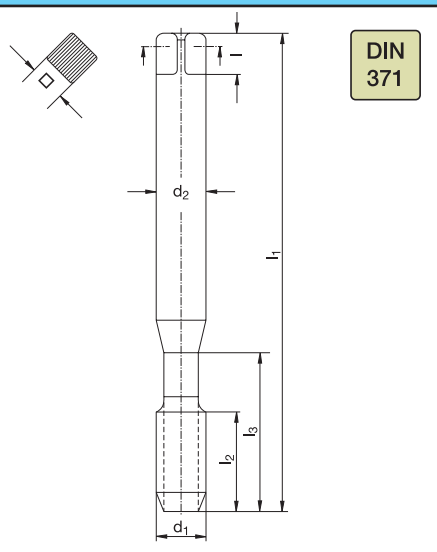
Standmenge · Tool life · Durée de vie · Durata

M Typ UNI IKA 6HX PS 55 60° 2-3 C 50° ≤ 3xd ≤ 1300 N/mm² DIN 13

| DIN 371 | | | | | | | | | | DIN 376 | | | | | | | | | | |
|--|-----------|------------------------|------------------------|------------------------|--|-----------|-----------|---|-----------|--|-----------|------------------------|------------------------|------------------------|--|-----------|------|-----------|------|---------|
| | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | 571 737 ⁴⁴⁰ GU-50 HARDLUBE | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | 576 737 ⁴⁴⁰ GU-50 HARDLUBE | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | 1; 2; 3; 4; 6.1; 6.2; 7 | | | | | Werkstoffgruppen Groupes de matières | | | | | 1; 2; 3; 4; 6.1; 6.2; 7 | | | | | |
| Classification of work materials Gruppo materiali | | | | | Code | | | | | Classification of work materials Gruppo materiali | | | | | Code | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 433 745 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 4 | 10,2 | 433 748 |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 433 746 | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 4 | 12 | 433 749 |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 433 747 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 4 | 14 | 433 750 |
| | | | | | | | | | | | M 18 | 2,5 | 125 | 25 | 14 | 14 | 11 | 4 | 15,5 | 433 751 |
| | | | | | | | | | | | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 433 752 |
| | | | | | | | | | | | M 24 | 3 | 160 | 30 | 18 | 17 | 14,5 | 4 | 21 | 433 754 |



M
PS 55



| | | | | | |
|---|--|--|---|--|--|
| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 571 723 ⁴⁴⁰ GU-50 HARDLUBE | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 576 723 ⁴⁴⁰ GU-50 HARDLUBE |
|---|--|--|---|--|--|

| | | | | | |
|---|--|----------------------------|---|--|----------------------------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 3; 4; 6.1; 6.2; 7 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 3; 4; 6.1; 6.2; 7 |
|---|--|----------------------------|---|--|----------------------------|

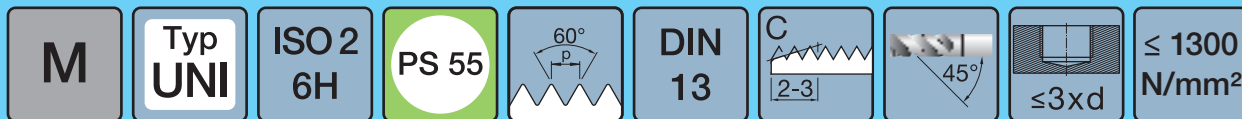
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code |
|------------------------|-----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|
| | | | | | | | | | | | | | | | | | | | | |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 433 853 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 4 | 10,2 | 433 865 |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 433 855 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 4 | 14 | 433 867 |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 433 856 | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 433 869 |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 433 857 | | | | | | | | | | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 433 858 | | | | | | | | | | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 433 859 | | | | | | | | | | |

M
Typ UNI
6GX
PS 55
60°
DIN 13
C 2-3
50°
≤3xd
≤ 1300 N/mm²

| DIN 371 Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | 571 763⁴⁴⁰ GU-50 HARDLUBE | | | | | DIN 376 Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | 576 763⁴⁴⁰ GU-50 HARDLUBE | | | | | | |
|--|-----------|------------------------|------------------------|------------------------|---|-----------|-----------|---|-----------|--|------------------------|-----------|------------------------|------------------------|---|-----------|-----------|---|-----------|---------|--|
| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | 1; 2; 3; 4; 6.1; 6.2; 7 | | | | | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | 1; 2; 3; 4; 6.1; 6.2; 7 | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 433 803 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 4 | 10,2 | 433 815 | |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 433 805 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 4 | 14 | 433 817 | |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 433 806 | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 433 819 | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 433 807 | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 433 808 | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 433 809 | | | | | | | | | | | |

M

PS 55



M
PS 55

| DIN 371 | | DIN 376 | |
|--|----------------------------------|--|----------------------------------|
| | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | 571 603 ⁴⁴⁰ | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | 576 603 ⁴⁴⁰ |
| Catalogue n° ^{W%} | GU-45 STiN | Catalogue n° ^{W%} | GU-45 STiN |
| Werkstoffgruppen Groupes de matières | 1.1-1.5; 2; 3; 4; 6.1; 6.2; 7 | Werkstoffgruppen Groupes de matières | 1.1-1.5; 2; 3; 4; 6.1; 6.2; 7 |
| Classification of work materials Gruppo materiali | | Classification of work materials Gruppo materiali | |
| d₁ [mm] P [mm] l₁ [mm] l₂ [mm] l₃ [mm] d₂ [mm] l [mm] □ [mm] z ∅ [mm] | Code | d₁ [mm] P [mm] l₁ [mm] l₂ [mm] d₂ [mm] l [mm] □ [mm] z ∅ [mm] | Code |
| M 3 0,5 56 5 18 3,5 6 2,7 3 2,5 | 439 062 | M 12 1,75 110 18 9 10 7 3 10,2 | 439 069 |
| M 4 0,7 63 7 21 4,5 6 3,4 3 3,3 | 439 064 | M 16 2 110 20 12 12 9 4 14 | 439 071 |
| M 5 0,8 70 8 25 6 8 4,9 3 4,2 | 439 065 | M 20 2,5 140 25 16 15 12 4 17,5 | 439 073 |
| M 6 1 80 10 30 6 8 4,9 3 5 | 439 066 | | |
| M 8 1,25 90 13 35 8 9 6,2 3 6,8 | 439 067 | | |
| M 10 1,5 100 15 39 10 11 8 3 8,5 | 439 068 | | |

Einsatzbeispiele · Application examples · Exemple d'utilisation · Esempio di applicazione

| Werkzeugtyp · Tool type Type d'outil · Utensile | GU-45 | HSSE TiCN |
|--|---|--------------|
| Werkstoff · Work material Pièce à usiner · Materiale | 1.7225 – 42 CrMo 4 V (900 N/mm ²) | |
| Gewinde · Thread size Taraudage · Filettatura | M 10 - ISO2 (6H) | |
| Gewindetiefe Thread depth Profondeur de taraudage Profondita' | 20 mm Sackloch · Blind hole · Trou borgne · Cieco | |
| V_c | 12 m/min | |
| KSS Coolant lubricant Lubrification Lubrificante | 6 % Emulsion · Emulsion · Emulsion · Emulsione | |
| Standmenge · Tool life Durée de vie · Durata | 163 % | 100 % |

Standmenge · Tool life · Durée de vie · Durata

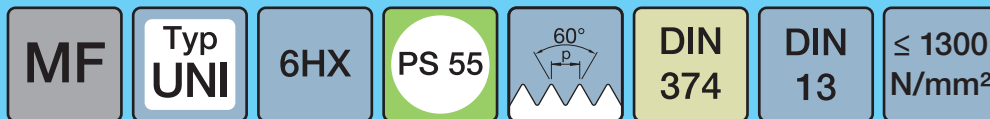


| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | |
|---|-----------|------------------------|------------------------|------------------------|-----------|-----------|-------|-----------|--|---|-----------|------------------------|------------------------|------------------------|-----------|-----------|-------|-----------|---|
| Werkstoffgruppen Groupes de matières | | | | | | | | | | Werkstoffgruppen Groupes de matières | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | | | | | | | | Classification of work materials Gruppo materiali | | | | | | | | | |
| Code | | | | | | | | | | Code | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | |
| M 3 x 0,35 | 56 | 8 | 2,2 | - | - | 3 | 2,65 | 433 463 | 574 403⁴⁴⁰ GU-B HARDLUBE | M 3 x 0,35 | 56 | 4 | 2,2 | - | - | 3 | 2,65 | 433 763 | 574 703⁴⁴⁰ GU-50 HARDLUBE |
| M 4 x 0,5 | 63 | 10 | 2,8 | 5 | 2,1 | 3 | 3,5 | 433 464 | | M 4 x 0,5 | 63 | 6 | 2,8 | 5 | 2,1 | 3 | 3,5 | 433 764 | |
| M 5 x 0,5 | 70 | 12 | 3,5 | 6 | 2,7 | 3 | 4,5 | 433 465 | | M 5 x 0,5 | 70 | 7 | 3,5 | 6 | 2,7 | 3 | 4,5 | 433 765 | |
| M 6 x 0,5 | 80 | 14 | 4,5 | 6 | 3,4 | 3 | 5,5 | 433 466 | | M 6 x 0,5 | 80 | 8 | 4,5 | 6 | 3,4 | 3 | 5,5 | 433 766 | |
| M 6 x 0,75 | 80 | 14 | 4,5 | 6 | 3,4 | 3 | 5,25 | 433 467 | | M 6 x 0,75 | 80 | 8 | 4,5 | 6 | 3,4 | 3 | 5,25 | 433 767 | |
| M 8 x 0,75 | 80 | 18 | 6 | 8 | 4,9 | 3 | 7,25 | 433 468 | | M 8 x 0,75 | 80 | 10 | 6 | 8 | 4,9 | 3 | 7,25 | 433 768 | |
| M 8 x 1 | 90 | 22 | 6 | 8 | 4,9 | 3 | 7 | 433 469 | | M 8 x 1 | 90 | 10 | 6 | 8 | 4,9 | 3 | 7 | 433 769 | |
| M 10 x 1 | 90 | 20 | 7 | 8 | 5,5 | 3 | 9 | 433 472 | | M 10 x 1 | 90 | 12 | 7 | 8 | 5,5 | 4 | 9 | 433 772 | |
| M 10 x 1,25 | 100 | 24 | 7 | 8 | 5,5 | 3 | 8,75 | 433 473 | | M 10 x 1,25 | 100 | 12 | 7 | 8 | 5,5 | 4 | 8,75 | 433 773 | |
| M 12 x 1 | 100 | 22 | 9 | 10 | 7 | 3 | 11 | 433 475 | | M 12 x 1 | 100 | 14 | 9 | 10 | 7 | 4 | 11 | 433 775 | |
| M 12 x 1,25 | 100 | 22 | 9 | 10 | 7 | 3 | 10,75 | 433 476 | | M 12 x 1,25 | 100 | 14 | 9 | 10 | 7 | 4 | 10,75 | 433 776 | |
| M 12 x 1,5 | 100 | 22 | 9 | 10 | 7 | 3 | 10,5 | 433 477 | | M 12 x 1,5 | 100 | 14 | 9 | 10 | 7 | 4 | 10,5 | 433 777 | |
| M 14 x 1,5 | 100 | 22 | 11 | 12 | 9 | 4 | 12,5 | 433 480 | | M 14 x 1,5 | 100 | 16 | 11 | 12 | 9 | 4 | 12,5 | 433 780 | |
| M 16 x 1,5 | 100 | 22 | 12 | 12 | 9 | 4 | 14,5 | 433 484 | | M 16 x 1,5 | 100 | 16 | 12 | 12 | 9 | 5 | 14,5 | 433 784 | |
| M 18 x 1,5 | 110 | 25 | 14 | 14 | 11 | 4 | 16,5 | 433 486 | | M 18 x 1,5 | 110 | 20 | 14 | 14 | 11 | 5 | 16,5 | 433 786 | |
| M 20 x 1,5 | 125 | 25 | 16 | 15 | 12 | 4 | 18,5 | 433 489 | | M 20 x 1,5 | 125 | 20 | 16 | 15 | 12 | 5 | 18,5 | 433 789 | |
| M 22 x 1,5 | 125 | 25 | 18 | 17 | 14,5 | 3 | 20,5 | 433 461 | | M 22 x 1,5 | 125 | 20 | 18 | 17 | 14,5 | 5 | 20,5 | 433 761 | |
| M 24 x 1,5 | 140 | 28 | 18 | 17 | 14,5 | 3 | 22,5 | 433 462 | | M 24 x 1,5 | 140 | 24 | 18 | 17 | 14,5 | 5 | 22,5 | 433 762 | |

MF

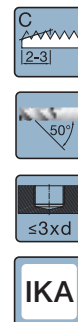
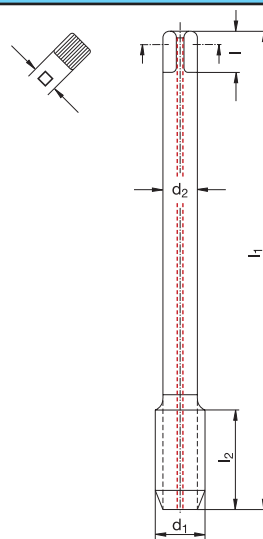
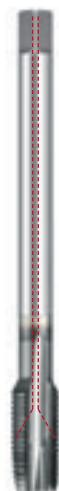
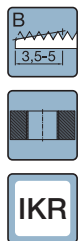
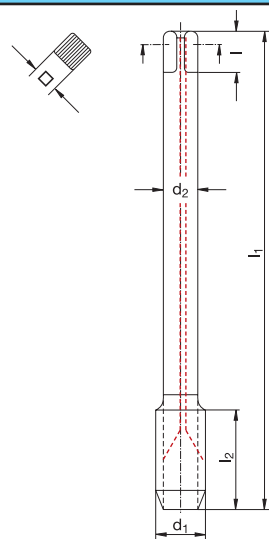
PS 55





MF

PS 55



Katalog-Nr. ^{W%} Catalogue no. ^{W%}
Catalogue n^o ^{W%} Nr. di catalogo ^{W%}

574 437⁴⁴⁰
GU-B HARDLUBE

Katalog-Nr. ^{W%} Catalogue no. ^{W%}
Catalogue n^o ^{W%} Nr. di catalogo ^{W%}

574 737⁴⁴⁰
GU-50 HARDLUBE

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1; 2; 3; 4; 6.1;
6.2; 7

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1; 2; 3; 4; 6.1;
6.2; 7

d₁ P l₁ l₂ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

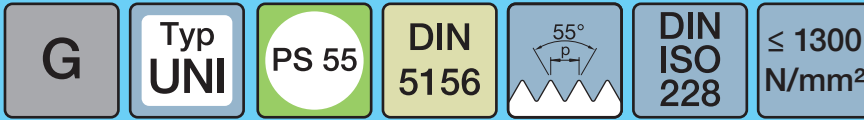
Code

d₁ P l₁ l₂ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

Code

| | | | | | | | | |
|-------------|-----|----|----|----|-----|---|-------|---------|
| M 8 x 1 | 90 | 22 | 6 | 8 | 4,9 | 3 | 7 | 433 490 |
| M 10 x 1 | 90 | 20 | 7 | 8 | 5,5 | 3 | 9 | 433 491 |
| M 10 x 1,25 | 100 | 24 | 7 | 8 | 5,5 | 3 | 8,75 | 433 492 |
| M 12 x 1 | 100 | 22 | 9 | 10 | 7 | 3 | 11 | 433 493 |
| M 12 x 1,25 | 100 | 22 | 9 | 10 | 7 | 3 | 10,75 | 433 494 |
| M 12 x 1,5 | 100 | 22 | 9 | 10 | 7 | 3 | 10,5 | 433 495 |
| M 14 x 1,5 | 100 | 22 | 11 | 12 | 9 | 4 | 12,5 | 433 496 |
| M 16 x 1,5 | 100 | 22 | 12 | 12 | 9 | 4 | 14,5 | 433 497 |
| M 18 x 1,5 | 110 | 25 | 14 | 14 | 11 | 4 | 16,5 | 433 498 |
| M 20 x 1,5 | 125 | 25 | 16 | 15 | 12 | 4 | 18,5 | 433 499 |

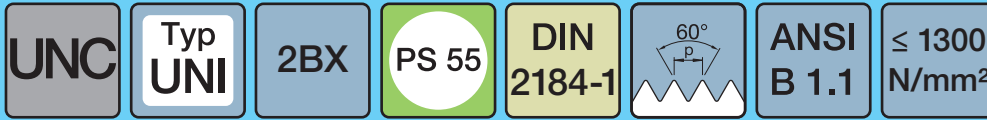
| | | | | | | | | |
|-------------|-----|----|----|----|-----|---|-------|---------|
| M 8 x 1 | 90 | 10 | 6 | 8 | 4,9 | 3 | 7 | 433 790 |
| M 10 x 1 | 90 | 12 | 7 | 8 | 5,5 | 4 | 9 | 433 791 |
| M 10 x 1,25 | 100 | 12 | 7 | 8 | 5,5 | 4 | 8,75 | 433 792 |
| M 12 x 1 | 100 | 14 | 9 | 10 | 7 | 4 | 11 | 433 793 |
| M 12 x 1,25 | 100 | 14 | 9 | 10 | 7 | 4 | 10,75 | 433 794 |
| M 12 x 1,5 | 100 | 14 | 9 | 10 | 7 | 4 | 10,5 | 433 795 |
| M 14 x 1,5 | 100 | 16 | 11 | 12 | 9 | 4 | 12,5 | 433 796 |
| M 16 x 1,5 | 100 | 16 | 12 | 12 | 9 | 5 | 14,5 | 433 797 |
| M 18 x 1,5 | 110 | 20 | 14 | 14 | 11 | 5 | 16,5 | 433 798 |
| M 20 x 1,5 | 125 | 20 | 16 | 15 | 12 | 5 | 18,5 | 433 799 |



| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 580 403 ⁴⁴⁰ GU-B HARDLUBE | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 580 703 ⁴⁴⁰ GU-50 HARDLUBE | | | |
|--|--|---|--|--|--|------|---------|----------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 3; 4; 6.1; 6.2; 7 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 3; 4; 6.1; 6.2; 7 | | | |
| P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | □ | z | ∅ | Code |
| G 1/8 | 28 | 9,73 | 90 | 20 | 7 | 5,5 | 3 8,8 | 433 220 |
| G 1/4 | 19 | 13,16 | 100 | 22 | 11 | 9 | 3 11,8 | 433 221 |
| G 3/8 | 19 | 16,66 | 100 | 22 | 12 | 9 | 3 15,25 | 433 222 |
| G 1/2 | 14 | 20,96 | 125 | 25 | 16 | 12 | 3 19 | 433 223 |
| G 5/8 | 14 | 22,91 | 125 | 25 | 18 | 14,5 | 4 21 | 433 224 |
| G 3/4 | 14 | 26,44 | 140 | 26 | 20 | 16 | 4 24,5 | 433 225 |
| G 1 | 11 | 33,25 | 160 | 30 | 25 | 20 | 4 30,75 | 433 227 |
| G 1/8 | 28 | 9,73 | 90 | 12 | 7 | 5,5 | 3 8,8 | 433 240 |
| G 1/4 | 19 | 13,16 | 100 | 15 | 11 | 9 | 4 11,8 | 433 241 |
| G 3/8 | 19 | 16,66 | 100 | 15 | 12 | 9 | 4 15,25 | 433 242 |
| G 1/2 | 14 | 20,96 | 125 | 18 | 16 | 12 | 4 19 | 433 243 |
| G 5/8 | 14 | 22,91 | 125 | 18 | 18 | 14,5 | 4 21 | 433 244 |
| G 3/4 | 14 | 26,44 | 140 | 20 | 20 | 16 | 5 24,5 | 433 245 |
| G 1 | 11 | 33,25 | 160 | 22 | 25 | 20 | 5 30,75 | 433 247 |

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PS 55



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PS 55



| UNC | | PS 55 | | UNC | | PS 55 | | | | | | | | | | | | | | | | | | | | | | | |
|--|-------|--|-----|--|------|--|------|--|---------|--|-------|--------|-----|----|------|------|------|---------|---------|---------|-------|--------|-----|----|------|------|------|---------|---------|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 520 403 ⁴⁴⁰ GU-B HARDLUBE | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 520 703 ⁴⁴⁰ GU-50 HARDLUBE | | | | | | | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1; 2; 3; 4; 6.1; 6.2; 7 | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1; 2; 3; 4; 6.1; 6.2; 7 | | | | | | | | | | | | | | | | | | | |
| P d₁ l₁ l₂ l₃ d₂ □ z Ø [Gg/1"] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | Code | | P d₁ l₁ l₂ l₃ d₂ □ z Ø [Gg/1"] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | Code | | P d₁ l₁ l₂ l₃ d₂ □ z Ø [Gg/1"] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | Code | | | | | | | | | | | | | | | | | | | |
| # 2-56 | 2,18 | 45 | 9 | 12 | 2,8 | 2,1 | 3 | 1,85 | 433 571 | # 2-56 | 2,18 | 45 | 9 | 12 | 2,8 | 2,1 | 3 | 1,85 | 433 871 | # 2-56 | 2,18 | 45 | 9 | 12 | 2,8 | 2,1 | 3 | 1,85 | 433 871 |
| # 4-40 | 2,85 | 56 | 11 | 18 | 3,5 | 2,7 | 3 | 2,35 | 433 573 | # 4-40 | 2,85 | 56 | 5 | 18 | 3,5 | 2,7 | 3 | 2,35 | 433 873 | # 4-40 | 2,85 | 56 | 5 | 18 | 3,5 | 2,7 | 3 | 2,35 | 433 873 |
| # 6-32 | 3,51 | 56 | 12 | 20 | 4,0 | 3,0 | 3 | 2,85 | 433 575 | # 6-32 | 3,51 | 56 | 6 | 20 | 4,0 | 3,0 | 3 | 2,85 | 433 875 | # 6-32 | 3,51 | 56 | 6 | 20 | 4,0 | 3,0 | 3 | 2,85 | 433 875 |
| # 8-32 | 4,17 | 63 | 13 | 21 | 4,5 | 3,4 | 3 | 3,50 | 433 576 | # 8-32 | 4,17 | 63 | 7 | 21 | 4,5 | 3,4 | 3 | 3,50 | 433 876 | # 8-32 | 4,17 | 63 | 7 | 21 | 4,5 | 3,4 | 3 | 3,50 | 433 876 |
| # 10-24 | 4,83 | 70 | 16 | 25 | 6,0 | 4,9 | 3 | 3,90 | 433 577 | # 10-24 | 4,83 | 70 | 9 | 25 | 6,0 | 4,9 | 3 | 3,90 | 433 877 | # 10-24 | 4,83 | 70 | 9 | 25 | 6,0 | 4,9 | 3 | 3,90 | 433 877 |
| 1/4-20 | 6,35 | 80 | 19 | 30 | 7,0 | 5,5 | 3 | 5,10 | 433 579 | 1/4-20 | 6,35 | 80 | 10 | 30 | 7,0 | 5,5 | 3 | 5,10 | 433 879 | 1/4-20 | 6,35 | 80 | 10 | 30 | 7,0 | 5,5 | 3 | 5,10 | 433 879 |
| 5/16-18 | 7,94 | 90 | 22 | 35 | 6,0 | 4,9 | 3 | 6,60 | 433 580 | 5/16-18 | 7,94 | 90 | 13 | 35 | 6,0 | 4,9 | 3 | 6,60 | 433 880 | 5/16-18 | 7,94 | 90 | 13 | 35 | 6,0 | 4,9 | 3 | 6,60 | 433 880 |
| 3/8-16 | 9,53 | 100 | 24 | 39 | 7,0 | 5,5 | 3 | 8,00 | 433 581 | 3/8-16 | 9,53 | 100 | 15 | 39 | 7,0 | 5,5 | 3 | 8,00 | 433 881 | 3/8-16 | 9,53 | 100 | 15 | 39 | 7,0 | 5,5 | 3 | 8,00 | 433 881 |
| 1/2-13 | 12,70 | 110 | 28 | - | 9,0 | 7,0 | 3 | 10,80 | 433 583 | 1/2-13 | 12,70 | 110 | 18 | - | 9,0 | 7,0 | 4 | 10,80 | 433 883 | 1/2-13 | 12,70 | 110 | 18 | - | 9,0 | 7,0 | 4 | 10,80 | 433 883 |
| 5/8-11 | 15,88 | 110 | 32 | - | 12,0 | 9,0 | 3 | 13,50 | 433 584 | 5/8-11 | 15,88 | 110 | 24 | - | 12,0 | 9,0 | 4 | 13,50 | 433 884 | 5/8-11 | 15,88 | 110 | 24 | - | 12,0 | 9,0 | 4 | 13,50 | 433 884 |
| 3/4-10 | 19,05 | 125 | 34 | - | 14,0 | 11,0 | 3 | 16,50 | 433 585 | 3/4-10 | 19,05 | 125 | 30 | - | 14,0 | 11,0 | 4 | 16,50 | 433 885 | 3/4-10 | 19,05 | 125 | 30 | - | 14,0 | 11,0 | 4 | 16,50 | 433 885 |
| 7/8-9 | 22,23 | 140 | 34 | - | 18,0 | 14,5 | 3 | 19,50 | 433 586 | 7/8-9 | 22,23 | 140 | 34 | - | 18,0 | 14,5 | 4 | 19,50 | 433 886 | 7/8-9 | 22,23 | 140 | 34 | - | 18,0 | 14,5 | 4 | 19,50 | 433 886 |
| 1 | - | 825,40 | 160 | 38 | - | 18,0 | 14,5 | 3 22,25 | 433 587 | 1 | - | 825,40 | 160 | 38 | - | 18,0 | 14,5 | 5 22,25 | 433 887 | 1 | - | 825,40 | 160 | 38 | - | 18,0 | 14,5 | 5 22,25 | 433 887 |

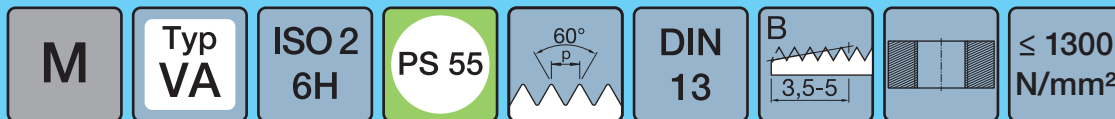


| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 530 403⁴⁴⁰ GU-B HARDLUBE | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 530 703⁴⁴⁰ GU-50 HARDLUBE | | | | | | | | | | | | | | |
|---|--|--|---|--|---|------|---|-------|---------|---------|-------|-----|----|----|------|------|---|-------|---------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 3; 4; 6.1; 6.2; 7 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 3; 4; 6.1; 6.2; 7 | | | | | | | | | | | | | | |
| P d ₁ l ₁ l ₂ l ₃ d ₂ □ z Ø [Gg/1"] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | Code | | P d ₁ l ₁ l ₂ l ₃ d ₂ □ z Ø [Gg/1"] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | Code | | | | | | | | | | | | | | | |
| # 4-48 | 2,85 | 56 | 11 | 18 | 3,5 | 2,7 | 3 | 2,40 | 433 592 | # 4-48 | 2,85 | 56 | 5 | 18 | 3,5 | 2,7 | 3 | 2,40 | 433 892 |
| # 6-40 | 3,51 | 56 | 12 | 20 | 4,0 | 3,0 | 3 | 2,95 | 433 593 | # 6-40 | 3,51 | 56 | 6 | 20 | 4,0 | 3,0 | 3 | 2,95 | 433 893 |
| # 8-36 | 4,17 | 63 | 13 | 21 | 4,5 | 3,4 | 3 | 3,50 | 433 594 | # 8-36 | 4,17 | 63 | 7 | 21 | 4,5 | 3,4 | 3 | 3,50 | 433 894 |
| # 10-32 | 4,83 | 70 | 16 | 25 | 6,0 | 4,9 | 3 | 4,10 | 433 595 | # 10-32 | 4,83 | 70 | 8 | 25 | 6,0 | 4,9 | 3 | 4,10 | 433 895 |
| 1/4-28 | 6,35 | 80 | 19 | 30 | 7,0 | 5,5 | 3 | 5,50 | 433 597 | 1/4-28 | 6,35 | 80 | 10 | 30 | 7,0 | 5,5 | 3 | 5,50 | 433 897 |
| 5/16-24 | 7,94 | 90 | 22 | 35 | 6,0 | 4,9 | 3 | 6,90 | 433 598 | 5/16-24 | 7,94 | 90 | 13 | 35 | 6,0 | 4,9 | 3 | 6,90 | 433 898 |
| 3/8-24 | 9,53 | 90 | 20 | 39 | 7,0 | 5,5 | 3 | 8,50 | 433 599 | 3/8-24 | 9,53 | 90 | 15 | 39 | 7,0 | 5,5 | 3 | 8,50 | 433 899 |
| 1/2-20 | 12,70 | 100 | 22 | - | 9,0 | 7,0 | 4 | 11,50 | 433 601 | 1/2-20 | 12,70 | 100 | 18 | - | 9,0 | 7,0 | 4 | 11,50 | 433 901 |
| 5/8-18 | 15,88 | 100 | 22 | - | 12,0 | 9,0 | 4 | 14,50 | 433 603 | 5/8-18 | 15,88 | 100 | 20 | - | 12,0 | 9,0 | 4 | 14,50 | 433 903 |
| 3/4-16 | 19,05 | 110 | 25 | - | 14,0 | 11,0 | 4 | 17,50 | 433 604 | 3/4-16 | 19,05 | 110 | 21 | - | 14,0 | 11,0 | 4 | 17,50 | 433 904 |
| 7/8-14 | 22,23 | 125 | 25 | - | 18,0 | 14,5 | 3 | 20,40 | 433 605 | 7/8-14 | 22,23 | 125 | 23 | - | 18,0 | 14,5 | 4 | 20,40 | 433 905 |
| 1 | 25,40 | 125 | 25 | - | 18,0 | 14,5 | 4 | 23,25 | 433 606 | 1 | 25,40 | 125 | 25 | - | 18,0 | 14,5 | 4 | 23,25 | 433 906 |

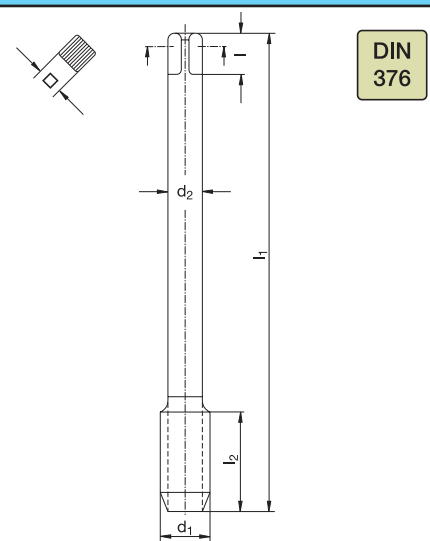
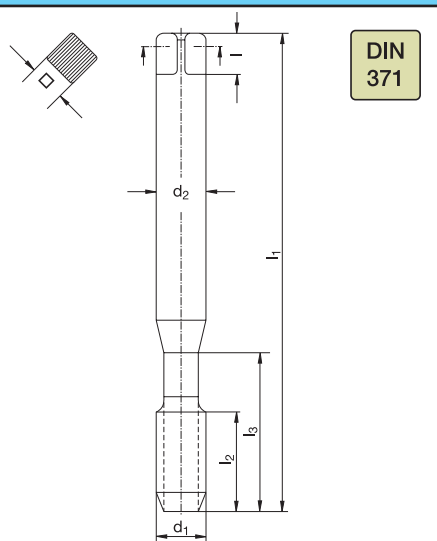
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| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 571 143 ⁴⁴⁰ VA-B TiCN | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 576 143 ⁴⁴⁰ VA-B TiCN | | | | | | | | | | | | | | | | |
|--|--|---|--|--|---|-----------|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|
| Werkstoffgruppen Groupes de matières | | 1; 2; 3.1; 3.3; 3.4; 4; 5.1; 5.2; 6.1; 6.2; 7 | Werkstoffgruppen Groupes de matières | | 1; 2; 3.1; 3.3; 3.4; 4; 5.1; 5.2; 6.1; 6.2; 7 | | | | | | | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 439 022 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 439 029 | |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 439 024 | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 439 031 | |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 439 025 | M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | 439 033 | |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 439 026 | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 439 027 | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 439 028 | | | | | | | | | | | |

M
Typ VA
ISO 2 6H
PS 55
60°
DIN 13
C 2-3
50°
≤ 3xd
≤ 1300 N/mm²

| DIN 371 | | | | | | | | | | DIN 376 | | | | | | | | | | |
|--|------|----------------|----------------|----------------|--|------|------|------|------|--|------|----------------|----------------|----------------|--|------|------|------|------|---------|
| | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | 571 343 ⁴⁴⁰ | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | 576 343 ⁴⁴⁰ | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | VA-50 TiCN | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | VA-50 TiCN | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | |
| 1; 2; 3.1; 3.3; 3.4; 4; 5.1; 5.2; 6.1; 6.2; 7 | | | | | Code | | | | | 1; 2; 3.1; 3.3; 3.4; 4; 5.1; 5.2; 6.1; 6.2; 7 | | | | | Code | | | | | |
| d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | ∅ | d ₁ | P | l ₁ | l ₂ | d ₂ | l | □ | z | ∅ | | |
| [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 433 070 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 4 | 10,2 | 433 077 |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 433 072 | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 4 | 12 | 433 078 |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 433 073 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 4 | 14 | 433 079 |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 433 074 | M 18 | 2,5 | 125 | 25 | 14 | 14 | 11 | 4 | 15,5 | 433 080 |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 433 075 | M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 433 081 |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 433 076 | M 22 | 2,5 | 140 | 25 | 18 | 17 | 14,5 | 4 | 19,5 | 433 082 |
| | | | | | | | | | | | M 24 | 3 | 160 | 30 | 18 | 17 | 14,5 | 4 | 21 | 433 083 |
| | | | | | | | | | | | M 27 | 3 | 160 | 30 | 20 | 19 | 16 | 4 | 24 | 433 084 |
| | | | | | | | | | | | M 30 | 3,5 | 180 | 35 | 22 | 21 | 18 | 4 | 26,5 | 433 085 |

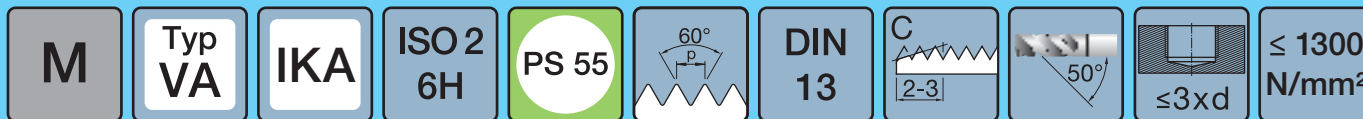
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PS 55

Einsatzbeispiele · Application examples · Exemple d'utilisation · Esempio di applicazione

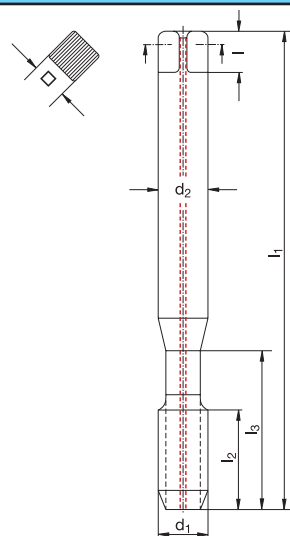
| Werkzeugtyp · Tool type Type d'outil · Utensile | HSSE-V3 TiCN | GU-50 | VA-50 |
|--|---|-------|-------|
| Werkstoff · Work material Pièce à usiner · Materiale | 1.4301 – X 5 CrNi 18-10 | | |
| Gewinde · Thread size Taraudage · Filettatura | M 8 – ISO2 (6H) | | |
| Gewindetiefe Thread depth Profondeur de taraudage Profondita' | 25 mm Sackloch · Blind hole Trou borgne · Cieco | | |
| V _c | 8 m/min | | |
| KSS Coolant lubricant Lubrification Lubrificante | 6–8% Emulsion · Emulsion · Emulsion · Emulsione | | |
| Standmenge · Tool life Durée de vie · Durata | 100 % | 154 % | 172 % |

Standmenge · Tool life · Durée de vie · Durata

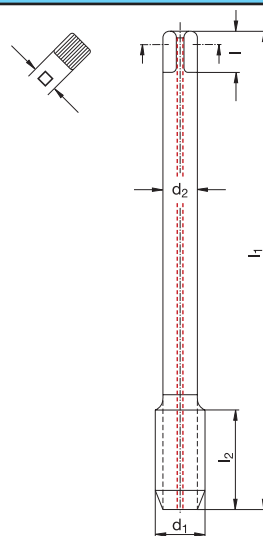


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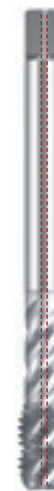
PS 55



DIN 371



DIN 376



Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

571 347⁴⁴⁰
VA-50 TiCN

Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

576 347⁴⁴⁰
VA-50 TiCN

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

1; 2; 3.1; 3.3; 3.4;
4; 5.1; 5.2; 6.1;
6.2; 7

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

1; 2; 3.1; 3.3; 3.4;
4; 5.1; 5.2; 6.1;
6.2; 7

| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] |
|------------------------|-----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|
|------------------------|-----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|

Code

| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] |
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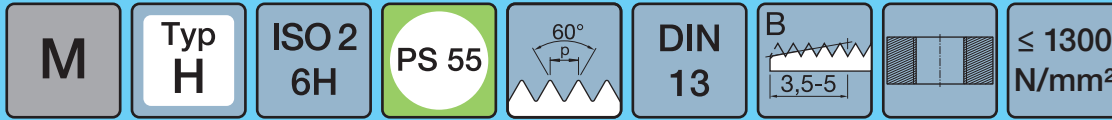
Code

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| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 |

433 347
433 348
433 349

| | | | | | | | | |
|------|------|-----|----|----|----|------|---|------|
| M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 4 | 10,2 |
| M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 4 | 12 |
| M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 4 | 14 |
| M 18 | 2,5 | 125 | 25 | 14 | 14 | 11 | 4 | 15,5 |
| M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 |
| M 22 | 2,5 | 140 | 25 | 18 | 17 | 14,5 | 4 | 19,5 |
| M 24 | 3 | 160 | 30 | 18 | 17 | 14,5 | 4 | 21 |
| M 27 | 3 | 160 | 30 | 20 | 19 | 16 | 4 | 24 |
| M 30 | 3,5 | 180 | 35 | 22 | 21 | 18 | 4 | 26,5 |

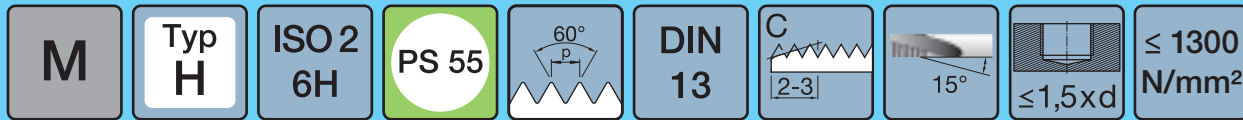
433 350
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433 354
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| DIN 371 | | | | | | | | | | DIN 376 | | | | | | | | | | |
|--|-----------|------------------------|------------------------|------------------------|--|-----------|-----------|---|-----------|--|------------------------|-----------|------------------------|------------------------|--|-----------|-----------|---|-----------|---------|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | |
| Catalogue n° ^{W%} | | | | | Catalogue n° ^{W%} | | | | | Catalogue n° ^{W%} | | | | | Catalogue n° ^{W%} | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 433 007 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 433 010 |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 433 000 | M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 3 | 12 | 433 011 |
| M 3,5 | 0,6 | 56 | 12 | 20 | 4 | 6 | 3 | 3 | 2,9 | 433 001 | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 4 | 14 | 433 012 |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 433 002 | M 18 | 2,5 | 125 | 34 | 14 | 14 | 11 | 4 | 15,5 | 433 013 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 433 003 | M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 4 | 17,5 | 433 014 |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 433 004 | M 22 | 2,5 | 140 | 34 | 18 | 17 | 14,5 | 4 | 19,5 | 433 015 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 433 005 | M 24 | 3 | 160 | 38 | 18 | 17 | 14,5 | 4 | 21 | 433 016 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 433 006 | M 27 | 3 | 160 | 38 | 20 | 19 | 16 | 4 | 24 | 433 017 |
| | | | | | | | | | | | M 30 | 3,5 | 180 | 45 | 22 | 21 | 18 | 4 | 26,5 | 433 018 |

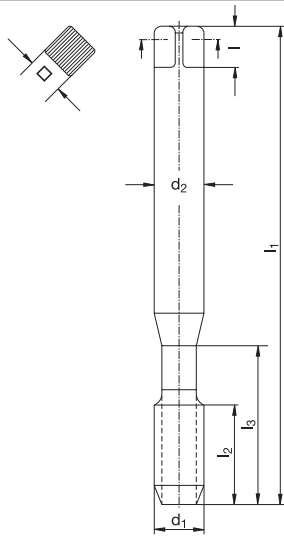
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PS 55



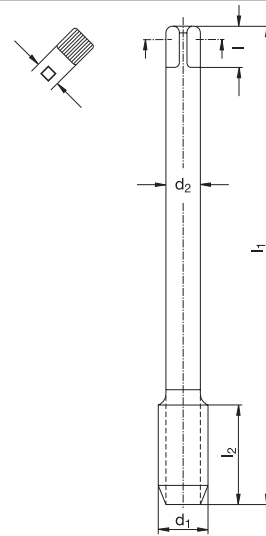


M

PS 55



DIN 371



DIN 376



Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

571 154⁴⁴⁰
H-15 TiCN

Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

576 154⁴⁴⁰
H-15 TiCN

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

1.4.1-1.4.4; 1.5.1-1.5.3; 2; 3.2; 3.5; 3.6; 4.4; 4.5; 5.3; 7.2; 7.3

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

1.4.1-1.4.4; 1.5.1-1.5.3; 2; 3.2; 3.5; 3.6; 4.4; 4.5; 5.3; 7.2; 7.3

| d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | ∅ |
|----------------|------|----------------|----------------|----------------|----------------|------|------|---|------|
| [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] |

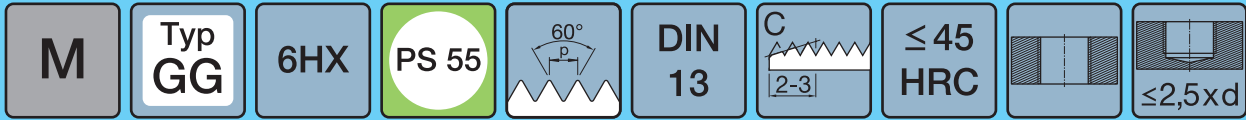
Code

| d ₁ | P | l ₁ | l ₂ | d ₂ | l | □ | z | ∅ |
|----------------|------|----------------|----------------|----------------|------|------|---|------|
| [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] |

Code

| | | | | | | | | | | |
|-------|------|-----|----|----|-----|----|-----|---|------|---------|
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 2 | 2,05 | 430 549 |
| M 3 | 0,5 | 56 | 5 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 430 550 |
| M 3,5 | 0,6 | 56 | 6 | 20 | 4 | 6 | 3 | 3 | 2,9 | 430 551 |
| M 4 | 0,7 | 63 | 7 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 430 552 |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 430 553 |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 430 554 |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 430 555 |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 430 556 |

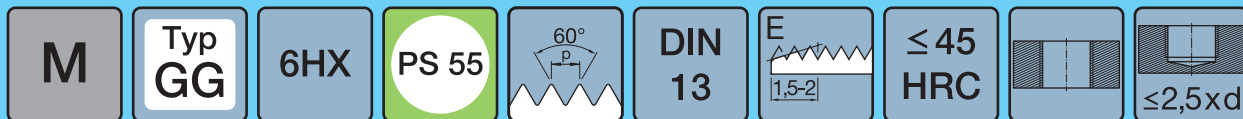
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|------|------|-----|----|----|----|------|---|------|---------|
| M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 3 | 10,2 | 430 557 |
| M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 3 | 12 | 430 558 |
| M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 3 | 14 | 430 559 |
| M 18 | 2,5 | 125 | 25 | 14 | 14 | 11 | 4 | 15,5 | 430 560 |
| M 20 | 2,5 | 140 | 25 | 16 | 15 | 12 | 4 | 17,5 | 430 561 |
| M 24 | 3 | 160 | 30 | 18 | 17 | 14,5 | 4 | 21 | 430 563 |
| M 27 | 3 | 160 | 30 | 20 | 19 | 16 | 4 | 24 | 430 564 |
| M 30 | 3,5 | 180 | 35 | 22 | 21 | 18 | 4 | 26,5 | 430 565 |



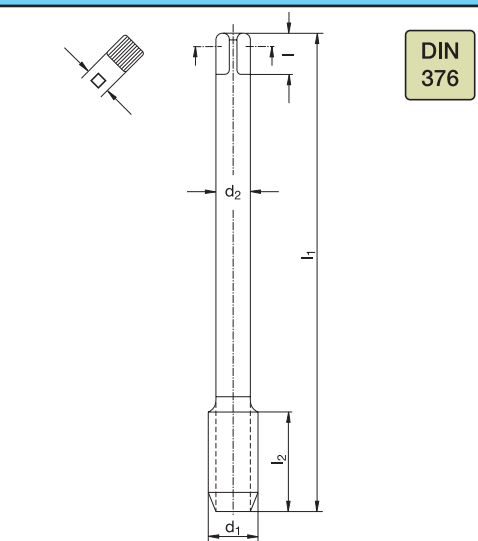
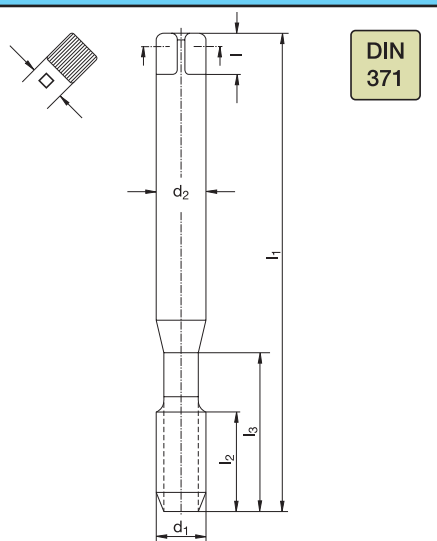
| DIN 371 | | | | | | | | | | | DIN 376 | | | | | | | | | | |
|--|------|----------------|----------------|----------------|----------------|------|------|---|------|---------|--|------|----------------|----------------|----------------|------|------|---|------|---------|--|
| | | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n ^o ^{W%} | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | | | | | | | Werkstoffgruppen Groupes de matières | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | | | | | | | | | Classification of work materials Gruppo materiali | | | | | | | | | | |
| Code | | | | | | | | | | | Code | | | | | | | | | | |
| 2; 3.2; 3.5; 3.6; 4.4; 4.5; 7.2; 7.3 | | | | | | | | | | | 2; 3.2; 3.5; 3.6; 4.4; 4.5; 7.2; 7.3 | | | | | | | | | | |
| d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | Ø | Code | d ₁ | P | l ₁ | l ₂ | d ₂ | l | □ | z | Ø | Code | |
| [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | | |
| M 3 | 0,5 | 56 | 6 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 434 803 | M 12 | 1,75 | 110 | 21 | 9 | 10 | 7 | 4 | 10,2 | 434 812 | |
| M 4 | 0,7 | 63 | 9 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 434 805 | M 14 | 2 | 110 | 24 | 11 | 12 | 9 | 4 | 12 | 434 813 | |
| M 5 | 0,8 | 70 | 10 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 434 806 | M 16 | 2 | 110 | 24 | 12 | 12 | 9 | 4 | 14 | 434 814 | |
| M 6 | 1 | 80 | 12 | 30 | 6 | 8 | 4,9 | 4 | 5 | 434 807 | M 18 | 2,5 | 125 | 30 | 14 | 14 | 11 | 4 | 15,5 | 434 815 | |
| M 8 | 1,25 | 90 | 15 | 35 | 8 | 9 | 6,2 | 4 | 6,8 | 434 809 | M 20 | 2,5 | 140 | 30 | 16 | 15 | 12 | 3 | 17,5 | 434 816 | |
| M 10 | 1,5 | 100 | 18 | 39 | 10 | 11 | 8 | 4 | 8,5 | 434 810 | M 22 | 2,5 | 140 | 30 | 22 | 21 | 18 | 5 | 19,5 | 434 817 | |
| | | | | | | | | | | | M 24 | 3 | 160 | 36 | 18 | 17 | 14,5 | 5 | 21 | 434 818 | |

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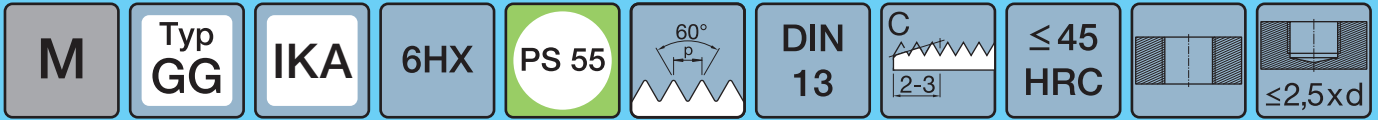
PS 55



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PS 55

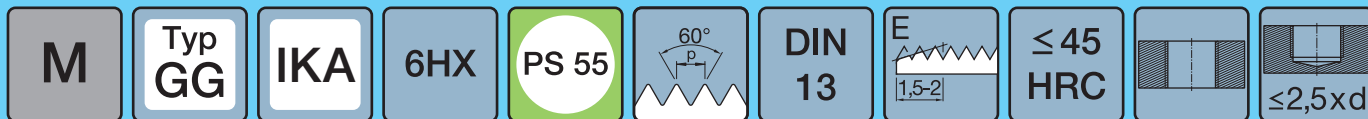


| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 571 381 ⁴⁸⁰ GG-H-FT | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 576 381 ⁴⁸⁰ GG-H-FT | | | | | | | | | | | | | | | | |
|--|--|--|--|--|-----------------------------------|-----------|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--|
| Werkstoffgruppen Groupes de matières | | Werkstoffgruppen Groupes de matières | | Werkstoffgruppen Groupes de matières | | | | | | | | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | Classification of work materials Gruppo materiali | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | |
| M 3 | 0,5 | 56 | 6 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 434 857 | M 12 | 1,75 | 110 | 21 | 9 | 10 | 7 | 4 | 10,2 | 434 863 | |
| M 4 | 0,7 | 63 | 9 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 434 858 | M 14 | 2 | 110 | 24 | 11 | 12 | 9 | 4 | 12 | 434 864 | |
| M 5 | 0,8 | 70 | 10 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 434 859 | M 16 | 2 | 110 | 24 | 12 | 12 | 9 | 2 | 14 | 434 865 | |
| M 6 | 1 | 80 | 12 | 30 | 6 | 8 | 4,9 | 4 | 5 | 434 860 | M 18 | 2,5 | 125 | 30 | 14 | 14 | 11 | 4 | 15,5 | 434 866 | |
| M 8 | 1,25 | 90 | 15 | 35 | 8 | 9 | 6,2 | 4 | 6,8 | 434 861 | M 20 | 2,5 | 140 | 30 | 16 | 15 | 12 | 4 | 17,5 | 434 867 | |
| M 10 | 1,5 | 100 | 18 | 39 | 10 | 11 | 8 | 4 | 8,5 | 434 862 | | | | | | | | | | | |



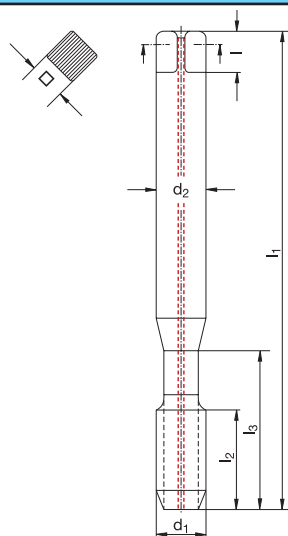
| DIN 371 | | | | | | | | | | DIN 376 | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----------------------------|--|--|--|--|---------|--|--|--|--|
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | | | | | | | | | | |
| Catalogue n ^o ^{W%} | | | | | Catalogue n ^o ^{W%} | | | | | Catalogue n ^o ^{W%} | | | | | Catalogue n ^o ^{W%} | | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | |
| d ₁ [mm] | | | | | P [mm] | | | | | d ₁ [mm] | | | | | P [mm] | | | | | | | | | | | | | | |
| l ₁ [mm] | | | | | l ₂ [mm] | | | | | l ₁ [mm] | | | | | l ₂ [mm] | | | | | | | | | | | | | | |
| l ₃ [mm] | | | | | l [mm] | | | | | l ₁ [mm] | | | | | l [mm] | | | | | | | | | | | | | | |
| d ₂ [mm] | | | | | l [mm] | | | | | d ₂ [mm] | | | | | l [mm] | | | | | | | | | | | | | | |
| z | | | | | z | | | | | z | | | | | z | | | | | | | | | | | | | | |
| Ø | | | | | Ø | | | | | Ø | | | | | Ø | | | | | | | | | | | | | | |
| Code | | | | | Code | | | | | Code | | | | | Code | | | | | | | | | | | | | | |
| M 6 | | | | | 1 80 12 30 6 8 4,9 4 5 | | | | | 434 745 | | | | | M 12 | | | | | 1,75 110 21 9 10 7 4 10,2 | | | | | 434 748 | | | | |
| M 8 | | | | | 1,25 90 15 35 8 9 6,2 4 6,8 | | | | | 434 746 | | | | | M 14 | | | | | 2 110 24 11 12 9 4 12 | | | | | 434 749 | | | | |
| M 10 | | | | | 1,5 100 18 39 10 11 8 4 8,5 | | | | | 434 747 | | | | | M 16 | | | | | 2 110 24 12 12 9 4 14 | | | | | 434 750 | | | | |
| | | | | | | | | | | | | | | | M 18 | | | | | 2,5 125 30 14 14 11 4 15,5 | | | | | 434 751 | | | | |
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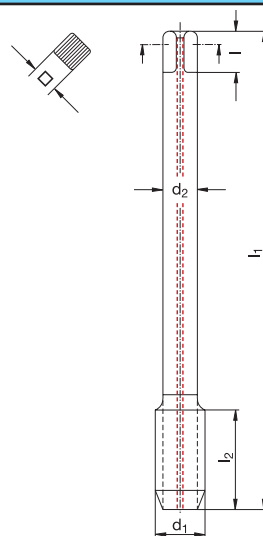


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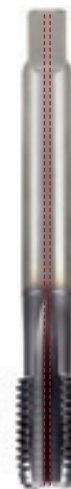
PS 55



DIN 371



DIN 376



Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

571 387⁴⁸⁰
GG-H-FT

Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

576 387⁴⁸⁰
GG-H-FT

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

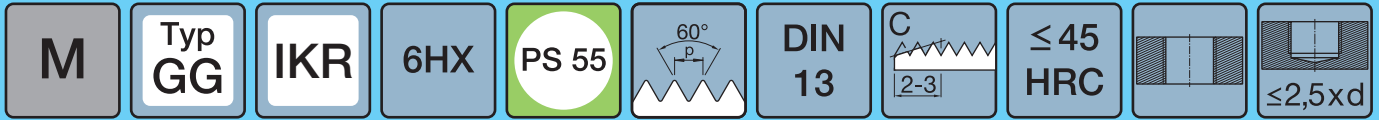
2; 3.2; 3.5; 3.6;
4.4; 4.5; 7.2; 7.3

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

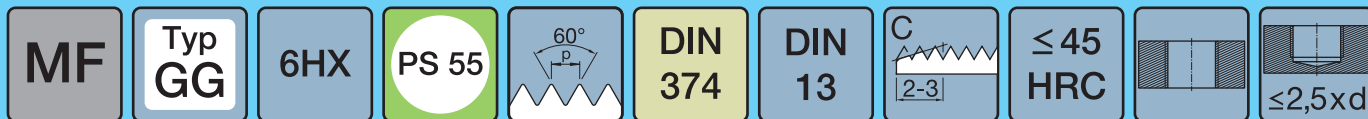
2; 3.2; 3.5; 3.6;
4.4; 4.5; 7.2; 7.3

| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
|------------------------|-----------|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|
| M 6 | 1 | 80 | 12 | 30 | 6 | 8 | 4,9 | 4 | 5 | 434 460 |
| M 8 | 1,25 | 90 | 15 | 35 | 8 | 9 | 6,2 | 4 | 6,8 | 434 461 |
| M 10 | 1,5 | 100 | 18 | 39 | 10 | 11 | 8 | 4 | 8,5 | 434 462 |

| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|
| M 12 | 1,75 | 110 | 21 | 9 | 10 | 7 | 4 | 10,2 | 434 463 |
| M 14 | 2 | 110 | 24 | 11 | 12 | 9 | 4 | 12 | 434 464 |
| M 16 | 2 | 110 | 24 | 12 | 12 | 9 | 3 | 14 | 434 465 |
| M 18 | 2,5 | 125 | 30 | 14 | 14 | 11 | 4 | 15,5 | 434 466 |
| M 20 | 2,5 | 140 | 30 | 16 | 15 | 12 | 4 | 17,5 | 434 467 |

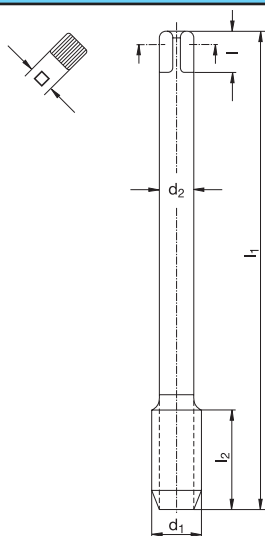


| DIN 371 | | | | | | | | | | DIN 376 | | | | | | | | | | |
|--|-----------|------------------------|------------------------|------------------------|--|-----------|-----------|---|-----------|--|------------------------|-----------|------------------------|------------------------|--|-----------|-----------|---|-----------|---------|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | |
| GG-H-FT | | | | | GG-H-FT | | | | | GG-H-FT | | | | | GG-H-FT | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | Werkstoffgruppen Groupes de matières | | | | | Werkstoffgruppen Groupes de matières | | | | | Werkstoffgruppen Groupes de matières | | | | | |
| Classification of work materials Gruppo materiali | | | | | Classification of work materials Gruppo materiali | | | | | Classification of work materials Gruppo materiali | | | | | Classification of work materials Gruppo materiali | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
| M 6 | 1 | 80 | 12 | 30 | 6 | 8 | 4,9 | 3 | 5 | 434 445 | M 12 | 1,75 | 110 | 21 | 9 | 10 | 7 | 4 | 10,2 | 434 448 |
| M 8 | 1,25 | 90 | 15 | 35 | 8 | 9 | 6,2 | 4 | 6,8 | 434 446 | M 14 | 2 | 110 | 24 | 11 | 12 | 9 | 4 | 12 | 434 449 |
| M 10 | 1,5 | 100 | 18 | 39 | 10 | 11 | 8 | 4 | 8,5 | 434 447 | M 16 | 2 | 110 | 24 | 12 | 12 | 9 | 4 | 14 | 434 450 |
| | | | | | | | | | | | M 18 | 2,5 | 125 | 30 | 14 | 14 | 11 | 4 | 15,5 | 434 451 |
| | | | | | | | | | | | M 20 | 2,5 | 140 | 30 | 16 | 15 | 12 | 4 | 17,5 | 434 452 |



MF

PS 55



Katalog-Nr. ^{W%} **574 281** ⁴⁸⁰
Catalogue no. ^{W%}
Catalogue n° ^{W%} **GG-H-FT**
Nr. di catalogo ^{W%}

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali
2; 3.2; 3.5; 3.6;
4.4; 4.5; 7.2; 7.3

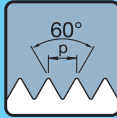
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|------------------------|-----------|------------------------|------------------------|------------------------|-----------|------|---|-----------|---------|
| M 3 x 0,35 | 0,35 | 56 | 6 | 2,2 | - | - | 3 | 2,65 | 434 763 |
| M 4 x 0,5 | 0,5 | 63 | 9 | 2,8 | 5 | 2,1 | 3 | 3,5 | 434 764 |
| M 5 x 0,5 | 0,5 | 70 | 10 | 3,5 | 6 | 2,7 | 3 | 4,5 | 434 765 |
| M 6 x 0,5 | 0,5 | 80 | 12 | 4,5 | 6 | 3,4 | 4 | 5,5 | 434 766 |
| M 6 x 0,75 | 0,75 | 80 | 12 | 4,5 | 6 | 3,4 | 3 | 5,25 | 434 767 |
| M 8 x 0,75 | 0,75 | 80 | 15 | 6 | 8 | 4,9 | 4 | 7,25 | 434 768 |
| M 8 x 1 | 1 | 90 | 15 | 6 | 8 | 4,9 | 4 | 7 | 434 769 |
| M 10 x 1 | 1 | 90 | 18 | 7 | 8 | 5,5 | 4 | 9 | 434 772 |
| M 10 x 1,25 | 1,25 | 100 | 18 | 7 | 8 | 5,5 | 4 | 8,75 | 434 773 |
| M 12 x 1 | 1 | 100 | 21 | 9 | 10 | 7 | 4 | 11 | 434 775 |
| M 12 x 1,25 | 1,25 | 100 | 21 | 9 | 10 | 7 | 4 | 10,75 | 434 776 |
| M 12 x 1,5 | 1,5 | 100 | 21 | 9 | 10 | 7 | 4 | 10,5 | 434 777 |
| M 14 x 1,5 | 1,5 | 100 | 24 | 11 | 12 | 9 | 4 | 12,5 | 434 780 |
| M 16 x 1,5 | 1,5 | 100 | 24 | 12 | 12 | 9 | 4 | 14,5 | 434 784 |
| M 18 x 1,5 | 1,5 | 110 | 30 | 14 | 14 | 11 | 4 | 16,5 | 434 786 |
| M 20 x 1,5 | 1,5 | 125 | 30 | 16 | 15 | 12 | 5 | 18,5 | 434 789 |
| M 22 x 1,5 | 1,5 | 125 | 20 | 18 | 17 | 14,5 | 5 | 20,5 | 434 791 |
| M 24 x 1,5 | 1,5 | 140 | 24 | 18 | 17 | 14,5 | 3 | 22,5 | 434 793 |

MF

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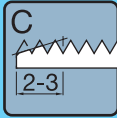
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PS 55

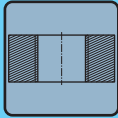


DIN
374

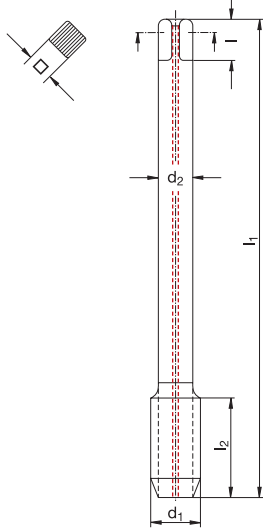
DIN
13



≤ 45
HRC



≤ 2,5xd



IKA

MF

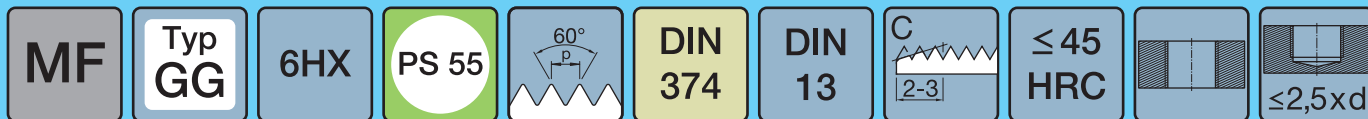
PS 55

Katalog-Nr. ^{W%} Catalogue no. ^{W%} **574 278⁴⁸⁰**
 Catalogue n° ^{W%} Nr. di catalogo ^{W%} **GG-H-FT**

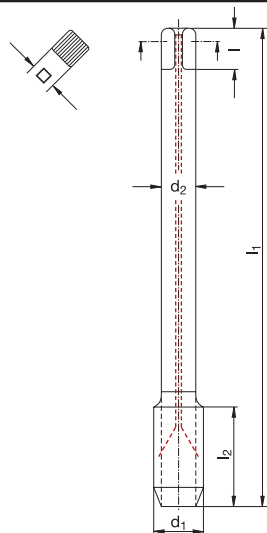
Werkstoffgruppen Classification of work materials 2; 3.2; 3.5; 3.6;
 Groupes de matières Gruppo materiali 4.4; 4.5; 7.2; 7.3

| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|-------|-----------|----------|
| M 8 x 1 | 90 | 15 | 6 | 8 | 4,9 | 4 | 7 | 434 360 | |
| M 10 x 1 | 90 | 18 | 7 | 8 | 5,5 | 4 | 9 | 434 363 | |
| M 10 x 1,25 | 100 | 18 | 7 | 8 | 5,5 | 4 | 8,75 | 434 364 | |
| M 12 x 1,25 | 100 | 21 | 9 | 10 | 7 | 4 | 10,75 | 434 367 | |
| M 12 x 1,5 | 100 | 21 | 9 | 10 | 7 | 4 | 10,5 | 434 368 | |
| M 14 x 1,5 | 100 | 24 | 11 | 12 | 9 | 4 | 12,5 | 434 371 | |
| M 16 x 1,5 | 100 | 24 | 12 | 12 | 9 | 4 | 14,5 | 434 375 | |
| M 18 x 1,5 | 110 | 30 | 14 | 14 | 11 | 4 | 16,5 | 434 377 | |
| M 20 x 1,5 | 125 | 30 | 16 | 15 | 12 | 4 | 18,5 | 434 380 | |





MF



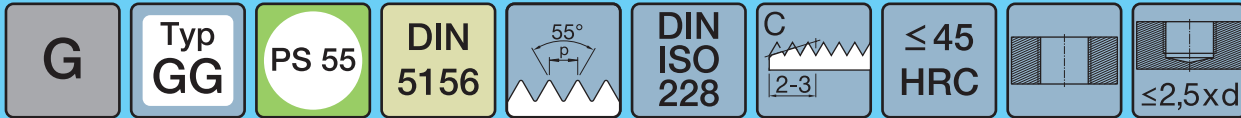
IKR

PS 55

Katalog-Nr. ^{W%} **574 288**⁴⁸⁰
 Catalogue no. ^{W%}
 Catalogue n° ^{W%} **GG-H-FT**
 Nr. di catalogo ^{W%}

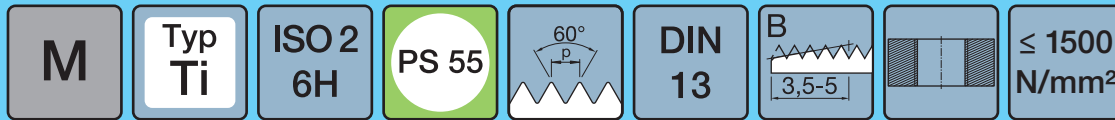
Werkstoffgruppen
Groupes de matières
 Classification of work materials
 Gruppo materiali
 2; 3.2; 3.5; 3.6;
 4.4; 4.5; 7.2; 7.3

| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|-------|-----------|------|
| M 8 x 1 | 90 | 15 | 6 | 8 | 4,9 | 4 | 7 | 434 260 | |
| M 10 x 1 | 90 | 18 | 7 | 8 | 5,5 | 4 | 9 | 434 263 | |
| M 10 x 1,25 | 100 | 18 | 7 | 8 | 5,5 | 4 | 8,75 | 434 264 | |
| M 12 x 1,25 | 100 | 21 | 9 | 10 | 7 | 4 | 10,75 | 434 267 | |
| M 12 x 1,5 | 100 | 21 | 9 | 10 | 7 | 4 | 10,5 | 434 268 | |
| M 14 x 1,5 | 100 | 24 | 11 | 12 | 9 | 4 | 12,5 | 434 271 | |
| M 16 x 1,5 | 100 | 24 | 12 | 12 | 9 | 4 | 14,5 | 434 275 | |
| M 18 x 1,5 | 110 | 30 | 14 | 14 | 11 | 4 | 16,5 | 434 277 | |
| M 20 x 1,5 | 125 | 30 | 16 | 15 | 12 | 3 | 18,5 | 434 280 | |



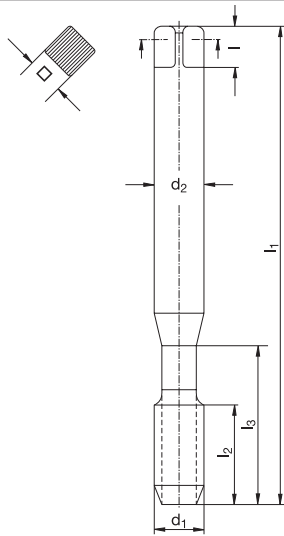
| | | | | G | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|----------------|--|----------------|--------------|----------------|----------------|----------------|-------|---------|---------|------|---------|------|------|------|------|------|------|------|--|-------|----|------|----|----|---|-----|---|-----|---------|-------|----|-------|-----|----|----|---|---|------|---------|-------|----|-------|-----|----|----|---|---|-------|---------|-------|----|-------|-----|----|----|----|---|----|---------|-------|----|-------|-----|----|----|----|---|------|---------|-------|----|-------|-----|----|----|------|---|----|---------|-------|----|-------|-----|----|----|----|---|-------|---------|-----|----|-------|-----|----|----|----|---|-------|---------|--|--|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 580 281 ⁴⁸⁰ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Catalogue n° ^{W%} Nr. di catalogo ^{W%} | | GG-H-FT | | PS 55 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2; 3.2; 3.5; 3.6; 4.4; 4.5; 7.2; 7.3 | | Code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>P</th> <th>d₁</th> <th>l₁</th> <th>l₂</th> <th>d₂</th> <th>□</th> <th>z</th> <th>∅</th> <th>Code</th> </tr> <tr> <th>[Gg/1"]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th></th> </tr> </thead> <tbody> <tr> <td>G 1/8</td> <td>28</td> <td>9,73</td> <td>90</td> <td>11</td> <td>7</td> <td>5,5</td> <td>4</td> <td>8,8</td> <td>434 241</td> </tr> <tr> <td>G 1/4</td> <td>19</td> <td>13,16</td> <td>100</td> <td>16</td> <td>11</td> <td>9</td> <td>4</td> <td>11,8</td> <td>434 242</td> </tr> <tr> <td>G 3/8</td> <td>19</td> <td>16,66</td> <td>100</td> <td>16</td> <td>12</td> <td>9</td> <td>4</td> <td>15,25</td> <td>434 243</td> </tr> <tr> <td>G 1/2</td> <td>14</td> <td>20,96</td> <td>125</td> <td>22</td> <td>16</td> <td>12</td> <td>5</td> <td>19</td> <td>434 244</td> </tr> <tr> <td>G 3/4</td> <td>14</td> <td>26,44</td> <td>140</td> <td>22</td> <td>20</td> <td>16</td> <td>5</td> <td>24,5</td> <td>434 246</td> </tr> <tr> <td>G 5/8</td> <td>14</td> <td>22,91</td> <td>125</td> <td>22</td> <td>18</td> <td>14,5</td> <td>5</td> <td>21</td> <td>434 245</td> </tr> <tr> <td>G 7/8</td> <td>14</td> <td>30,20</td> <td>150</td> <td>22</td> <td>22</td> <td>18</td> <td>6</td> <td>28,25</td> <td>434 247</td> </tr> <tr> <td>G 1</td> <td>11</td> <td>33,25</td> <td>160</td> <td>28</td> <td>25</td> <td>20</td> <td>6</td> <td>30,75</td> <td>434 248</td> </tr> </tbody> </table> | | P | d ₁ | | l ₁ | l ₂ | d ₂ | □ | z | ∅ | Code | [Gg/1"] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | G 1/8 | 28 | 9,73 | 90 | 11 | 7 | 5,5 | 4 | 8,8 | 434 241 | G 1/4 | 19 | 13,16 | 100 | 16 | 11 | 9 | 4 | 11,8 | 434 242 | G 3/8 | 19 | 16,66 | 100 | 16 | 12 | 9 | 4 | 15,25 | 434 243 | G 1/2 | 14 | 20,96 | 125 | 22 | 16 | 12 | 5 | 19 | 434 244 | G 3/4 | 14 | 26,44 | 140 | 22 | 20 | 16 | 5 | 24,5 | 434 246 | G 5/8 | 14 | 22,91 | 125 | 22 | 18 | 14,5 | 5 | 21 | 434 245 | G 7/8 | 14 | 30,20 | 150 | 22 | 22 | 18 | 6 | 28,25 | 434 247 | G 1 | 11 | 33,25 | 160 | 28 | 25 | 20 | 6 | 30,75 | 434 248 | | |
| P | d ₁ | l ₁ | l ₂ | | d ₂ | □ | z | ∅ | Code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [Gg/1"] | [mm] | [mm] | [mm] | | [mm] | [mm] | [mm] | [mm] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G 1/8 | 28 | 9,73 | 90 | | 11 | 7 | 5,5 | 4 | 8,8 | 434 241 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G 1/4 | 19 | 13,16 | 100 | | 16 | 11 | 9 | 4 | 11,8 | 434 242 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G 3/8 | 19 | 16,66 | 100 | | 16 | 12 | 9 | 4 | 15,25 | 434 243 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G 1/2 | 14 | 20,96 | 125 | | 22 | 16 | 12 | 5 | 19 | 434 244 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G 3/4 | 14 | 26,44 | 140 | | 22 | 20 | 16 | 5 | 24,5 | 434 246 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G 5/8 | 14 | 22,91 | 125 | | 22 | 18 | 14,5 | 5 | 21 | 434 245 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G 7/8 | 14 | 30,20 | 150 | 22 | 22 | 18 | 6 | 28,25 | 434 247 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| G 1 | 11 | 33,25 | 160 | 28 | 25 | 20 | 6 | 30,75 | 434 248 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Werkstoffgruppen · Classification of work materials · Classification des matières · Classificazione dei materiali | Materialbezeichnung · Material overview · Aperçu des matières · Panoramica dei materiali | Festigkeit · Toughness · Dureté · Resistenza a trazione [N/mm ²] | Rockwell [HRC] | Brinell [HB] | Schnittgeschwindigkeit · Cutting speed · Vitesse de coupe · Velocità di taglio V _c [m/min] | |
|---|--|--|----------------|--------------|---|-----------|
| | | | | | | IKA / IKR |
| 1.4.1 ~ 1.4.4 | Legierte, vergütete Stähle (kurzspanend) · Alloyed, pre hardened steels (short chipping) · Aciers alliés, aciers pré-traités (copeaux courts) · Leghe di acciaio pre-tempra a truciolo corto | 800–1200 | 25–35 | 255–328 | | 8 ~ 16 |
| 1.5.1 ~ 1.5.3 | Werkzeugstähle (kurzspanend) · Tool steels (short chipping) · Aciers à outils (copeaux courts) · Acciaio da utensile a truciolo corto | ~ 1400 | ~ 45 | ~ 420 | | 5 ~ 10 |
| 2.1 / 2.2 | Gusseisen mit Lamellengraphit (stark abrasiv) · Grey cast iron (very abrasive) · Fonte grise (très abrasive) · Ghisa grigia (molto abrasiva) | | | | 15 ~ 30 | 15 ~ 40 |
| 2.3 / 2.4 | Kugelgraphitguss · Nodular cast iron · Fonte nodulaire · Ghisa nodulare | | | | 15 ~ 50 | 15 ~ 60 |
| 3.2 | Kupfer-Legierungen (kurzspanend) · Copper alloys (short chipping) · Alliage de cuivre (copeaux courts) · Leghe di rame (truciolo corto) | | | | 15 ~ 30 | 15 ~ 40 |
| 3.5 | Kupfer-Sonderlegierungen · Copper special alloys · Alliages de cuivre spéciaux · Leghe speciali di rame | 690–1000 | ~ 32 | 200–300 | 15 ~ 30 | 15 ~ 40 |
| 3.6 | Kupfer-Sonderlegierungen (> 300 HB) · Copper special alloys (> 300 HB) · Alliages de cuivre spéciaux (> 300 HB) · Leghe speciali di rame (> 300 HB) | ≥ 1020 | ≥ 32 | ≥ 300 | 10 ~ 20 | 10 ~ 25 |
| 4.4 | Aluminium-Legierungen (10%–15% Si) · Aluminium alloys (10%–15% Si) · Alliages d'aluminium (10%–15% Si) · Leghe di alluminio (10%–15% Si) | | | | 20 ~ 50 | 20 ~ 60 |
| 4.5 | Aluminium-Legierungen (> 15% Si) · Aluminium alloys (> 15% Si) · Alliages d'aluminium (>15% Si) · Leghe di alluminio (> 15% Si) | | | | 15 ~ 30 | 15 ~ 40 |
| 7.2 | Duroplaste und Pressstoffe · Thermosetting polymers and pressed materials · Polymères thermodurcissables et matériaux pressés · Polimeri termoindurenti e materiali pressati | | | | 15 ~ 30 | 15 ~ 40 |
| 7.3 | Faserverstärkte Kunststoffe · Reinforced plastics · Plastiques renforcés · Plastiche rinforzate | | | | 15 ~ 30 | 15 ~ 40 |

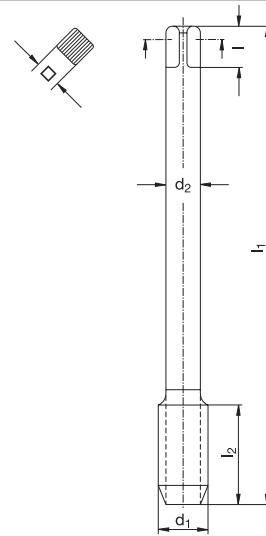


M

PS 55



DIN 371



DIN 376



Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

571 103¹⁴⁰
Ti-B OX

Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

576 103¹⁴⁰
Ti-B OX

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

5; 8.1

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

5; 8.1

d₁ P l₁ l₂ l₃ d₂ l □ z Ø
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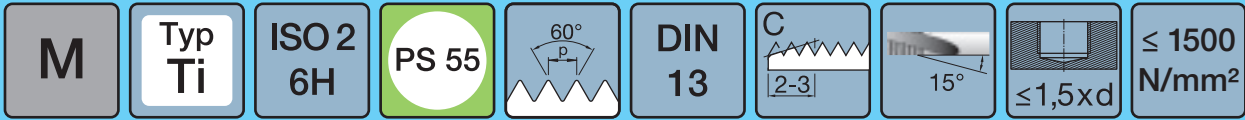
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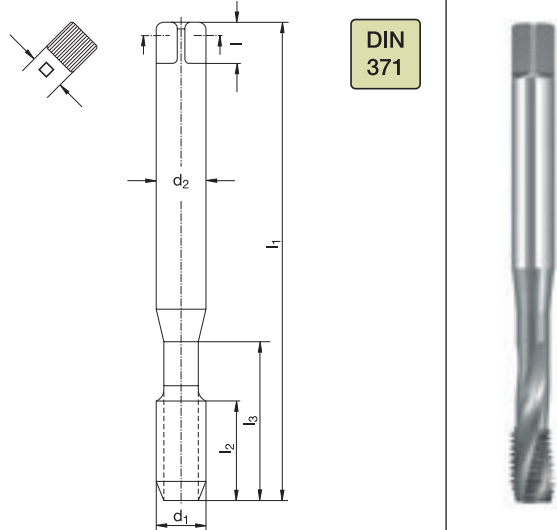
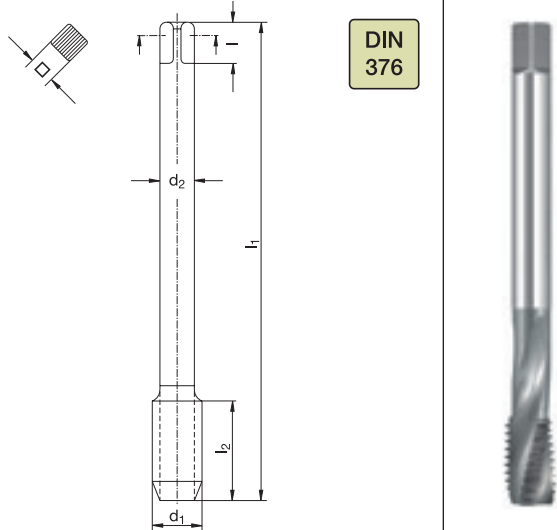
d₁ P l₁ l₂ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

Code

| | | | | | | | | | | |
|------|------|-----|----|----|-----|----|-----|---|-----|---------|
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 500 |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 502 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 030 503 |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | 030 504 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 030 505 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | 030 506 |

| | | | | | | | | | |
|------|------|-----|----|----|----|----|---|------|---------|
| M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 3 | 10,2 | 030 510 |
| M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 3 | 14 | 030 512 |
| M 20 | 2,5 | 140 | 34 | 16 | 15 | 12 | 3 | 17,5 | 030 514 |

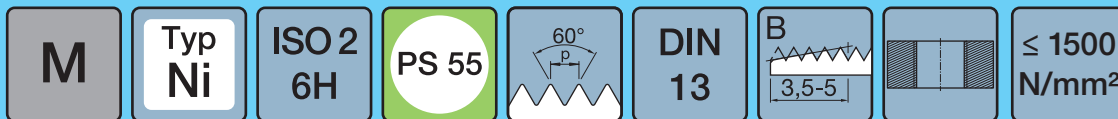


|  | | | | | | | | | | |  | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | |
| d₁ [mm] P [mm] l₁ [mm] l₂ [mm] l₃ [mm] d₂ [mm] l [mm] □ [mm] z ∅ [mm] | | | | | | | | | | | d₁ [mm] P [mm] l₁ [mm] l₂ [mm] d₂ [mm] l [mm] □ [mm] z ∅ [mm] | | | | | | | | | | |
| M 3 0,5 56 5 18 3,5 6 2,7 3 2,5 030 530 | | | | | | | | | | | M 12 1,75 110 18 9 10 7 3 10,2 030 540 | | | | | | | | | | |
| M 4 0,7 63 7 21 4,5 6 3,4 3 3,3 030 532 | | | | | | | | | | | M 16 2 110 20 12 12 9 3 14 030 542 | | | | | | | | | | |
| M 5 0,8 70 8 25 6 8 4,9 3 4,2 030 533 | | | | | | | | | | | M 20 2,5 140 25 16 15 12 4 17,5 030 544 | | | | | | | | | | |
| M 6 1 80 10 30 6 8 4,9 3 5 030 534 | | | | | | | | | | | | | | | | | | | | | |
| M 8 1,25 90 13 35 8 9 6,2 3 6,8 030 535 | | | | | | | | | | | | | | | | | | | | | |
| M 10 1,5 100 15 39 10 11 8 3 8,5 030 536 | | | | | | | | | | | | | | | | | | | | | |

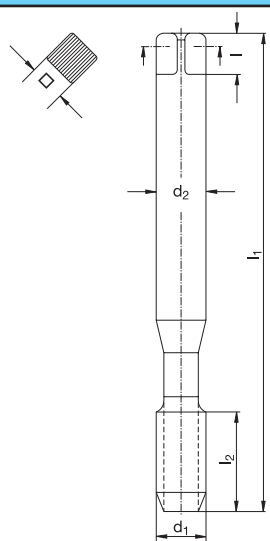
M

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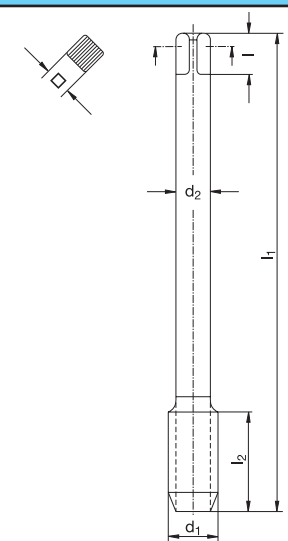




M
PS 55



DIN 371



DIN 376



| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 571 109 ¹⁴⁰ | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 576 109 ¹⁴⁰ | | |
|--|-----------|------------------------|------------------------|--|-----------|------------------------|---|-----------|
| Catalogue n ^o ^{W%} | | Ni-B | | Catalogue n ^o ^{W%} | | Ni-B | | |
| Werkstoffgruppen Groupes de matières | | 6.3 | | Werkstoffgruppen Groupes de matières | | 6.3 | | |
| Classification of work materials Gruppo materiali | | Code | | Classification of work materials Gruppo materiali | | Code | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] |
| M 3 | 0,5 | 56 | 12 | 3,5 | 6 | 2,7 | 3 | 2,5 |
| M 4 | 0,7 | 63 | 16 | 4,5 | 6 | 3,4 | 3 | 3,3 |
| M 5 | 0,8 | 70 | 19 | 6 | 8 | 4,9 | 3 | 4,2 |
| M 6 | 1 | 80 | 23 | 6 | 8 | 4,9 | 3 | 5 |
| M 8 | 1,25 | 90 | 30 | 8 | 9 | 6,2 | 3 | 6,8 |
| M 10 | 1,5 | 100 | 38 | 10 | 11 | 8 | 3 | 8,5 |



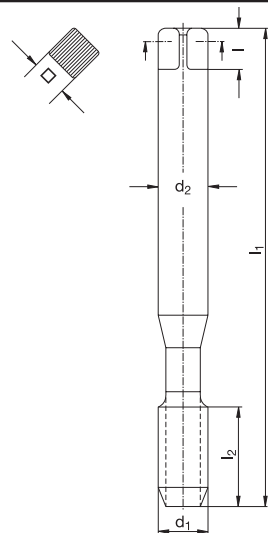
| DIN 371 | | | | | | | | | | DIN 376 | | | | | | | | | |
|--|-----------|------------------------|------------------------|------------------------|--|-----------|---|-----------|---------|--|-----------|------------------------|------------------------|------------------------|--|-----------|---|-----------|---------|
| | | | | | | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | | | |
| Catalogue n ^o ^{W%} | | | | | Catalogue n ^o ^{W%} | | | | | Catalogue n ^o ^{W%} | | | | | Catalogue n ^o ^{W%} | | | | |
| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | |
| Code | | | | | Code | | | | | Code | | | | | Code | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | |
| M 3 | 0,5 | 56 | 11 | 3,5 | 6 | 2,7 | 3 | 2,5 | 030 730 | M 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 3 | 10,2 | 030 740 |
| M 4 | 0,7 | 63 | 14 | 4,5 | 6 | 3,4 | 3 | 3,3 | 030 732 | | | | | | | | | | |
| M 5 | 0,8 | 70 | 17 | 6 | 8 | 4,9 | 3 | 4,2 | 030 733 | | | | | | | | | | |
| M 6 | 1 | 80 | 21 | 6 | 8 | 4,9 | 3 | 5 | 030 734 | | | | | | | | | | |
| M 8 | 1,25 | 90 | 28 | 8 | 9 | 6,2 | 3 | 6,8 | 030 735 | | | | | | | | | | |
| M 10 | 1,5 | 100 | 35 | 10 | 11 | 8 | 3 | 8,5 | 030 736 | | | | | | | | | | |



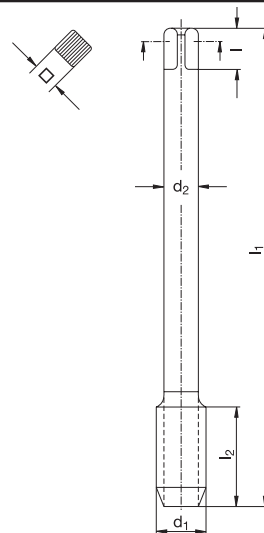


MJ

PS 55



DIN 371



DIN 376



Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

573 119¹⁴⁰
Ni-10

Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

573 119¹⁴⁰
Ni-10

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

6.3

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

6.3

d₁ P l₁ l₂ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

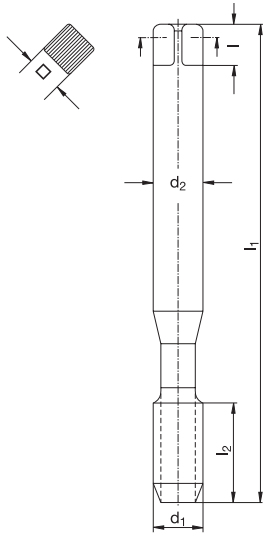
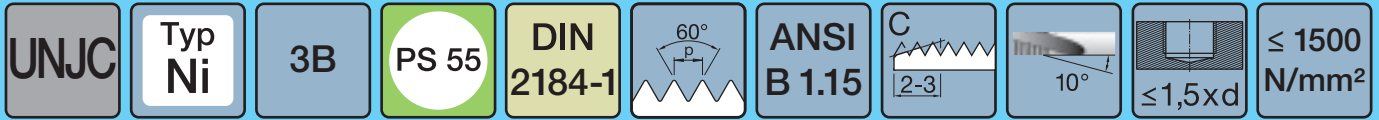
Code

d₁ P l₁ l₂ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

Code

| | | | | | | | | | |
|-------|------|-----|----|-----|----|-----|---|-----|---------|
| MJ 3 | 0,5 | 56 | 11 | 3,5 | 6 | 2,7 | 3 | 2,6 | 030 750 |
| MJ 4 | 0,7 | 63 | 14 | 4,5 | 6 | 3,4 | 3 | 3,4 | 030 752 |
| MJ 5 | 0,8 | 70 | 17 | 6 | 8 | 4,9 | 3 | 4,3 | 030 753 |
| MJ 6 | 1 | 80 | 21 | 6 | 8 | 4,9 | 3 | 5,1 | 030 754 |
| MJ 8 | 1,25 | 90 | 28 | 8 | 9 | 6,2 | 3 | 6,9 | 030 755 |
| MJ 10 | 1,5 | 100 | 35 | 10 | 11 | 8 | 3 | 8,7 | 030 756 |

| | | | | | | | | | |
|-------|------|-----|----|----|----|---|---|------|---------|
| MJ 12 | 1,75 | 110 | 18 | 9 | 10 | 7 | 3 | 10,5 | 030 760 |
| MJ 16 | 2 | 110 | 20 | 12 | 12 | 9 | 3 | 14,3 | 030 762 |

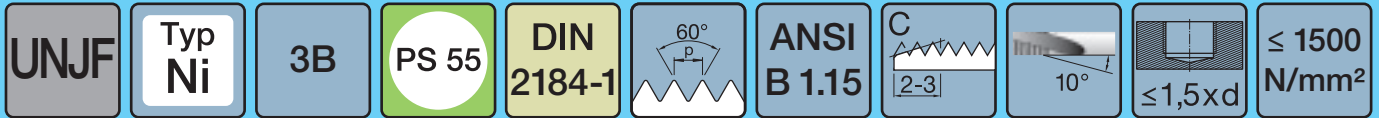


UNJC

PS 55

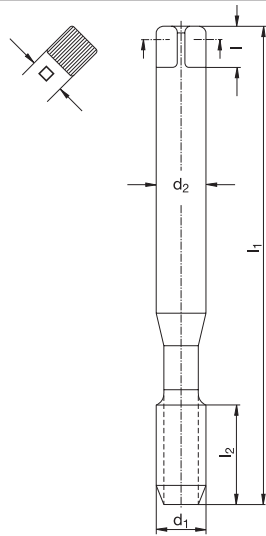


| | | |
|---|--|------------------------|
| Katalog-Nr. ^{W%} | Catalogue no. ^{W%} | 523 119 ¹⁴⁰ |
| Catalogue n° ^{W%} | Nr. di catalogo ^{W%} | Ni-10 |
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 6.3 |
| P d ₁ l ₁ l ₂ d ₂ l □ z Ø | Code | |
| [Gg/1"] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | |
| # 4-40 2,85 56 10 3,5 6 2,7 3 2,3 | 030 770 | |
| # 6-32 3,51 56 13 4 6 3 3 2,8 | 030 771 | |
| # 8-32 4,17 63 15 4,5 6 3,4 3 3,5 | 030 772 | |
| # 10-24 4,83 70 18 6 8 4,9 3 3,9 | 030 773 | |
| 1/4-20 6,35 80 23 7 8 5,5 3 5,2 | 030 774 | |
| 5/16-18 7,94 90 28 8 9 6,2 3 6,7 | 030 775 | |
| 3/8-16 9,53 100 33 10 11 8 3 8,1 | 030 776 | |



UNJF

PS 55



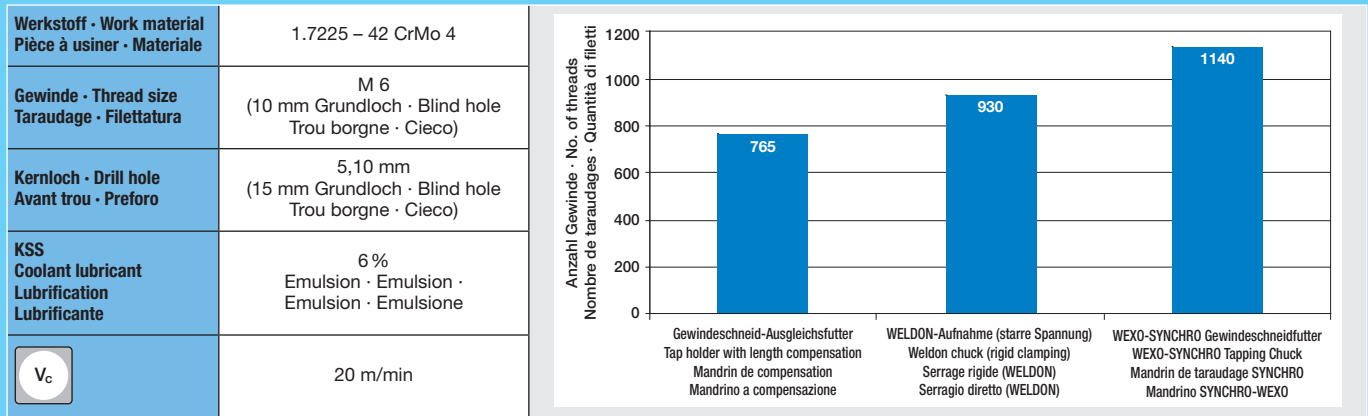
| | | | | | | | | | |
|--|---|-------------------------------|----|-----|----|-----|---|-----|---------|
| Katalog-Nr. ^{W%} | Catalogue no. ^{W%} | 533 119 ¹⁴⁰ | | | | | | | |
| Catalogue n° ^{W%} | Nr. di catalogo ^{W%} | Ni-10 | | | | | | | |
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 6.3 | | | | | | | |
| P [Gg/1"] | d₁ [mm] | l₁ [mm] | | | | | | | |
| d₂ [mm] | l₂ [mm] | d [mm] | | | | | | | |
| z | Ø [mm] | Code | | | | | | | |
| # 6-40 | 3,51 | 56 | 13 | 4 | 6 | 3 | 3 | 3,0 | 030 780 |
| # 8-36 | 4,17 | 63 | 15 | 4,5 | 6 | 3,4 | 3 | 3,6 | 030 781 |
| # 10-32 | 4,83 | 70 | 18 | 6 | 8 | 4,9 | 3 | 4,2 | 030 782 |
| 1/4-28 | 6,35 | 80 | 23 | 7 | 8 | 5,5 | 3 | 5,6 | 030 783 |
| 5/16-24 | 7,94 | 90 | 28 | 8 | 9 | 6,2 | 3 | 7,0 | 030 784 |
| 3/8-24 | 9,53 | 100 | 33 | 10 | 11 | 8 | 3 | 8,6 | 030 785 |

SYNCHRO Gewindebohrer / SYNCHRO Taps / Tarauds SYNCHRO / Maschi SYNCHRO



Bearbeitungsbeispiel – Standzeitvergleich
Application example – Tool life comparison
Exemple d'utilisation – Comparaison durée de vie
Esempio di lavorazione – Comparazione di durata

Bearbeitungsbeispiel – Standzeitvergleich • Application example – Tool life comparison
Exemple d'utilisation – Comparaison durée de vie • Esempio di lavorazione – Comparazione di durata



Bemerkung:

Die Standzeit konnte im Vergleich zum Gewindeschneid-Ausgleichsfutter um ca. 50% und im Vergleich mit der WELDON-Aufnahme (starre Spannung) um ca. 20% erhöht werden. Es entsteht eine bessere Oberflächenqualität des hergestellten Gewindes.



Remark:

Tool life increase of approx. 50% against the tap holder with length compensation and approx. 20% against weldon chuck (rigid clamping). Thread surface quality improvement.



Remarques :

En comparant avec un mandrin de compensation la durée de vie peut être augmentée de 50% et de 20% en comparant avec un serrage rigide (WELDON).



Note:

Si è potuta aumentare la durata di circa il 50% rispetto al mandrino tradizionale e di circa il 20% rispetto all'attacco Weldon in pinza rigida. Ne consegue inoltre una migliore qualità della superficie del filetto prodotto.



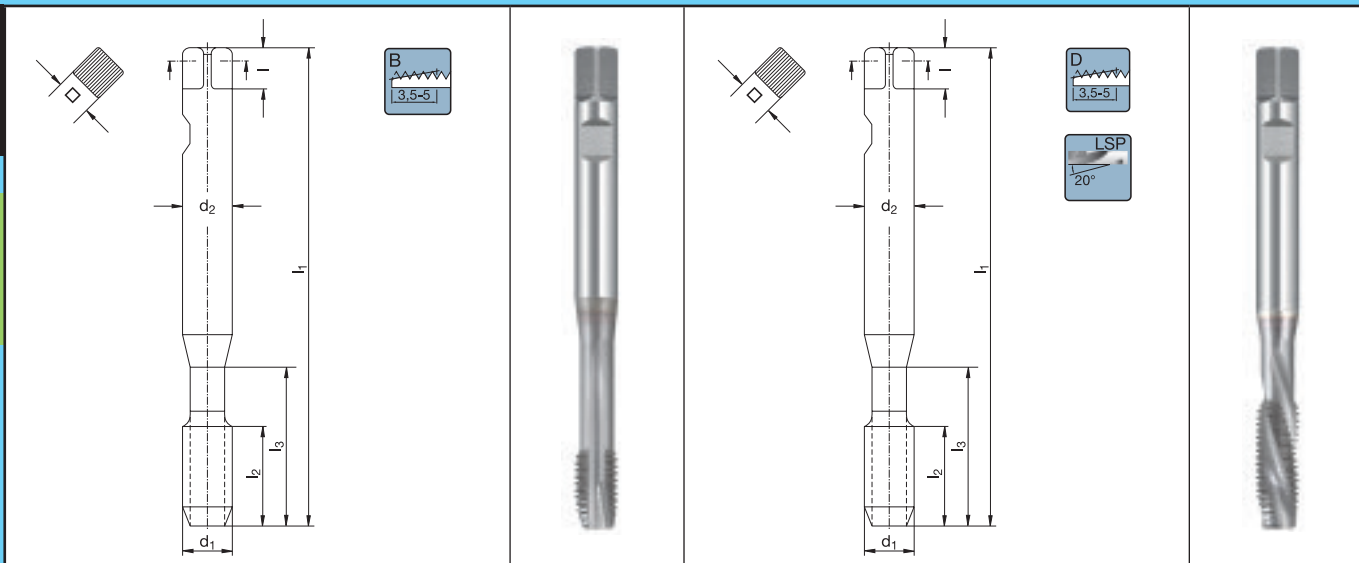
| | | Typ UNI B 3,5-5 ≤ 1200 N/mm ² | Typ UNI D 3,5-5 LSP 20° ≤ 1200 N/mm ² | Typ UNI C 2-3 50° ≤ 1200 N/mm ² | Typ UNI C 2-3 50° IKA ≤ 1200 N/mm ² | Typ W/45° C 2-3 45° | | | | | |
|--|--|---|---|--|---|------------------------------|---------|---------|---------|---------|---------|
| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 900 140*440 | 900 141*440 | 900 440*440 | 900 447*440 | 900 410*440 | | | | | |
| | | HS-GU-B TiCN | HS-GU-L20 TiCN | HS-GU-50 TiCN | HS-GU-50 TiCN | HS-W-45 CrN | | | | | |
| | | 168 | 168 | 169 | 169 | 169 | | | | | |
| optimal - recommended use - bon approprié - ottimale | 8-12 | V _c | V _c | V _c | V _c | V _c | | | | | |
| geeignet - suitable - de manière appropriée - utilizzabile | 8-12 | | | | | | | | | | |
| | MAT | | | | | | | | | | |
| | | ≤ 1,5 x d | > 1,5 x d | ≤ 1,5 x d | > 1,5 x d | ≤ 2 x d | ≤ 3 x d | ≤ 2 x d | ≤ 3 x d | ≤ 2 x d | ≤ 3 x d |
| | 1.1-1.2 | 50~60 | 40~50 | 50~60 | 40~50 | 40~50 | 30~40 | 40~50 | 30~40 | | |
| | 1.3 | 40~50 | 30~40 | 40~50 | 30~40 | 30~40 | 20~30 | 30~40 | 20~30 | | |
| | 1.4 | 20~30 | 15~20 | 20~30 | 15~20 | 18~25 | 15~18 | 18~25 | 15~18 | | |
| | 1.5 | 20~25 | 15~20 | 20~25 | 15~20 | 15~18 | 12~15 | 15~18 | 12~15 | | |
| | 1.6 | 12~20 | 8~12 | 12~20 | 8~12 | 12~15 | 10~12 | 12~15 | 10~12 | | |
| | 2.1 / 2.2 / 3.4 / 4.5 | 25~35 | 18~25 | 25~35 | 18~25 | 20~30 | 15~20 | 20~30 | 15~20 | | |
| | 2.3 / 2.4 / 3.5 | 20~25 | 15~20 | 20~25 | 15~20 | 15~20 | 10~15 | 15~20 | 10~15 | | |
| | 3.1 / 3.3 | 25~30 | 18~25 | 25~30 | 18~25 | 20~25 | 15~20 | 20~25 | 15~20 | 20~25 | 15~20 |
| | 3.2 | 50~70 | 40~50 | 50~70 | 40~50 | 40~50 | 30~40 | 40~50 | 30~40 | 40~50 | 30~40 |
| | 4.1 / 4.2 | 60~80 | 50~60 | 60~80 | 50~60 | 50~70 | 40~50 | 50~70 | 40~50 | 50~70 | 40~50 |
| | 4.3 / 4.4 / 7.1 | 40~50 | 30~40 | 40~50 | 30~40 | 30~40 | 20~30 | 30~40 | 20~30 | 30~40 | 20~30 |
| | 5.1 | 15~25 | 10~15 | 15~25 | 10~15 | 10~20 | 8~10 | 10~20 | 8~10 | | |
| | 5.2 | 10~15 | 8~10 | 10~15 | 8~10 | 8~10 | 6~8 | 8~10 | 6~8 | | |
| | 6.1 | 20~30 | 15~20 | 20~30 | 15~20 | 15~20 | 10~15 | 15~20 | 10~15 | | |
| | 6.2 | 8~12 | 6~8 | 8~12 | 6~8 | 6~8 | 4~6 | 6~8 | 4~6 | | |

* = Nur für Synchronbearbeitung · Only for rigid tapping · Uniquement pour le taraudage rigide · Solo per maschiatura rigida



M

PS 55



| | | | | | |
|---|--|--|---|--|--|
| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 900 140 ⁴⁴⁰ HS-GU-B TiCN | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 900 141 ⁴⁴⁰ HS-GU-L20 TiCN |
|---|--|--|---|--|--|

| | | | | | |
|---|--|--------------------------------------|---|--|--------------------------------------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 3; 4; 5.1; 5.2; 6.1; 6.2; 7 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 3; 4; 5.1; 5.2; 6.1; 6.2; 7 |
|---|--|--------------------------------------|---|--|--------------------------------------|

| | | | | | | | | | | | Code | | | | | | | | | | | | Code | |
|----------------|------|----------------|----------------|----------------|----------------|------|------|------|------|------|-----------------|----------------|------|----------------|----------------|----------------|----------------|------|------|------|------|------|-----------------|------|
| d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | ∅ | | | d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | ∅ | | | |
| [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] |
| M 2 | 0,4 | 70 | 4 | 13 | 6 | 8 | 4,9 | 3 | 1,6 | | 432 010 | M 2 | 0,4 | 70 | 8 | 13 | 6 | 8 | 4,9 | 3 | 1,6 | | 432 110 | |
| M 2,5 | 0,45 | 70 | 5 | 14 | 6 | 8 | 4,9 | 3 | 2,05 | | 432 011 | M 2,5 | 0,45 | 70 | 9 | 14 | 6 | 8 | 4,9 | 3 | 2,05 | | 432 111 | |
| M 3 | 0,5 | 70 | 5 | 18 | 6 | 8 | 4,9 | 3 | 2,5 | | 432 012 | M 3 | 0,5 | 70 | 11 | 18 | 6 | 8 | 4,9 | 3 | 2,5 | | 432 112 | |
| M 4 | 0,7 | 70 | 7 | 21 | 6 | 8 | 4,9 | 3 | 3,3 | | 432 014 | M 4 | 0,7 | 70 | 13 | 21 | 6 | 8 | 4,9 | 3 | 3,3 | | 432 114 | |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | | 432 015 | M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | | 432 115 | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | | 432 016 | M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 3 | 5 | | 432 116 | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | | 432 017 | M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | | 432 117 | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | | 432 018 | M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 3 | 8,5 | | 432 118 | |
| M 12 | 1,75 | 110 | 18 | 44 | 12 | 12 | 9 | 3 | 10,2 | | 432 019 | M 12 | 1,75 | 110 | 29 | 44 | 12 | 12 | 9 | 3 | 10,2 | | 432 119 | |
| M 14 | 2 | 110 | 20 | 44 | 14 | 14 | 11 | 3 | 12 | | 432 020 | M 14 | 2 | 110 | 30 | 44 | 14 | 14 | 11 | 4 | 12 | | 432 120 | |
| M 16 | 2 | 110 | 20 | 44 | 16 | 15 | 12 | 4 | 14 | | 432 021 | M 16 | 2 | 110 | 32 | 44 | 16 | 15 | 12 | 4 | 14 | | 432 121 | |
| M 20 | 2,5 | 140 | 25 | 56 | 16 | 15 | 12 | 4 | 17,5 | | 432 023 | M 20 | 2,5 | 140 | 34 | 56 | 16 | 15 | 12 | 4 | 17,5 | | 432 123 | |



| Katalog-Nr. ^{W%} | Catalogue no. ^{W%} | | | | | | | | | | 900 440 ⁴⁴⁰ | 900 447 ⁴⁴⁰ | 900 410 ⁴⁴⁰ |
|---|--|------------------------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|--------------------------------------|--------------------------------------|--------------------------------|
| Catalogue n° ^{W%} | Nr. di catalogo ^{W%} | | | | | | | | | | HS-GU-50 TiCN | HS-GU-50 TiCN | HS-W-45 CrN |
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | | | | | | | | | | 1; 2; 3; 4; 5.1; 5.2; 6.1; 6.2; 7 | 1; 2; 3; 4; 5.1; 5.2; 6.1; 6.2; 7 | 3.1; 3.3; 3.4; 4.1-4.3; 7.1 |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | Code | Code | |
| M 2 | 0,4 | 70 | 4 | 13 | 6 | 8 | 4,9 | 3 | 1,6 | 432 210 | | | |
| M 2,5 | 0,45 | 70 | 5 | 14 | 6 | 8 | 4,9 | 3 | 2,05 | 432 211 | | | |
| M 3 | 0,5 | 70 | 5 | 18 | 6 | 8 | 4,9 | 3 | 2,5 | 432 212 | | 432 412 | |
| M 4 | 0,7 | 70 | 7 | 21 | 6 | 8 | 4,9 | 3 | 3,3 | 432 214 | | 432 414 | |
| M 5 | 0,8 | 70 | 8 | 25 | 6 | 8 | 4,9 | 3 | 4,2 | 432 215 | 432 315 | 432 415 | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 3 | 5 | 432 216 | 432 316 | 432 416 | |
| M 8 | 1,25 | 90 | 13 | 35 | 8 | 9 | 6,2 | 3 | 6,8 | 432 217 | 432 317 | 432 417 | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 3 | 8,5 | 432 218 | 432 318 | 432 418 | |
| M 12 | 1,75 | 110 | 18 | 44 | 12 | 12 | 9 | 4 | 10,2 | 432 219 | 432 319 | | |
| M 14 | 2 | 110 | 20 | 44 | 14 | 14 | 11 | 4 | 12 | 432 220 | 432 320 | | |
| M 16 | 2 | 110 | 20 | 55 | 16 | 15 | 12 | 4 | 14 | 432 221 | 432 321 | | |
| M 20 | 2,5 | 140 | 25 | 56 | 16 | 15 | 12 | 4 | 17,5 | 432 223 | 432 323 | | |

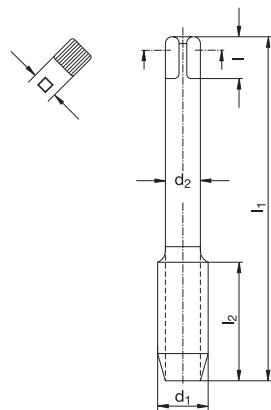
M

PS 55



M
MF
G

PS
105



Schneidöl
Cutting oil
Huile de coupe
Olio da taglio



| | | | | | |
|--|--|-------------------------------|-------------------------------|--------------------------------|--|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 954 100 ⁴⁴⁰ | 954 200 ⁴⁴⁰ | 990 050 ¹⁰⁰⁰ | |
| | | GH53-TiCN | GH53-TiCN | CURTIS 55-Cut E | |

| | | | | | |
|---|--|--------------------|--------------------|--------------------|--|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 8.2 42 - 53 HRC | 8.2 42 - 53 HRC | 8.2 42 - 63 HRC | |
|---|--|--------------------|--------------------|--------------------|--|

| d_1 [mm] | P [mm] | l_1 [mm] | l_2 [mm] | d_2 [mm] | l [mm] | \square [mm] | z | \varnothing [mm] | Code | Code | ml | Code |
|---------------|-----------|---------------|---------------|---------------|-----------|-------------------|---|-----------------------|------|------|----|------|
|---------------|-----------|---------------|---------------|---------------|-----------|-------------------|---|-----------------------|------|------|----|------|

| | | | | | | | | | | | | |
|------------|------|-----|----|-----|----|------|---|------|---------|---------|-----|---------|
| M 3 | 0,5 | 46 | 11 | 3,5 | 6 | 2,7 | 4 | 2,55 | 430 950 | 430 970 | 50 | 130 300 |
| M 4 | 0,7 | 52 | 13 | 4,5 | 6 | 3,4 | 4 | 3,4 | 430 951 | 430 971 | 125 | 130 301 |
| M 5 | 0,8 | 60 | 16 | 6 | 8 | 4,9 | 4 | 4,3 | 430 952 | 430 972 | 500 | 130 302 |
| M 6 | 1 | 62 | 19 | 6 | 8 | 4,9 | 4 | 5,1 | 430 953 | 430 973 | | |
| M 8 | 1,25 | 70 | 22 | 6 | 8 | 4,9 | 5 | 6,9 | 430 954 | 430 974 | | |
| M 10 | 1,5 | 75 | 24 | 7 | 8 | 5,5 | 5 | 8,6 | 430 955 | 430 975 | | |
| M 12 | 1,75 | 82 | 29 | 9 | 10 | 7 | 5 | 10,4 | 430 956 | 430 976 | | |
| M 14 | 2 | 88 | 30 | 11 | 12 | 9 | 5 | 12,1 | | 430 977 | | |
| M 16 | 2 | 95 | 32 | 12 | 12 | 9 | 5 | 14,1 | 430 958 | 430 978 | | |
| M 20 | 2,5 | 105 | 37 | 16 | 15 | 12 | 5 | 17,7 | 430 960 | 430 980 | | |
| M 24 | 3 | 160 | 38 | 18 | 17 | 14,5 | 5 | 21,2 | 430 961 | 430 998 | | |
| M 8 x 0,75 | | 70 | 22 | 6 | 8 | 4,9 | 5 | 7,4 | | 430 995 | | |
| M 8 x 1 | | 70 | 22 | 6 | 8 | 4,9 | 5 | 7,4 | | 430 997 | | |
| M 10 x 1 | | 75 | 24 | 7 | 8 | 5,5 | 5 | 9,1 | | 430 994 | | |
| M 12 x 1,5 | | 82 | 29 | 9 | 10 | 7 | 5 | 10,6 | | 430 982 | | |
| M 14 x 1,5 | | 88 | 30 | 11 | 12 | 9 | 5 | 12,6 | | 430 984 | | |
| M 16 x 1,5 | | 95 | 32 | 12 | 12 | 9 | 5 | 14,6 | | 430 985 | | |

Für zähe und schwer zerspanbare Werkstoffe und zum Hartgewindebohren bis ca. 63 HRC.
For ductile and difficult to cut materials and for high hardened materials up to 63 HRC.
Pour aciers tenaces et difficiles et pour usinage dans matières trempées jusqu'à 63 HRC.
Per materiali difficili da lavorare e temprati fino a 63 HRC.

| P [Gg/1"] | d_1 [mm] | l_1 [mm] | l_2 [mm] | d_2 [mm] | \square [mm] | z | \varnothing [mm] | | |
|--------------|---------------|---------------|---------------|---------------|-------------------|-----|-----------------------|------|---------|
| G 1/8 | 28 | 9,73 | 63 | 18 | 7 | 5,5 | 5 | 8,8 | 430 993 |
| G 1/4 | 19 | 13,16 | 70 | 20 | 11 | 9 | 5 | 11,9 | 430 990 |
| G 3/8 | 19 | 16,66 | 70 | 22 | 12 | 9 | 5 | 15,4 | 430 991 |




| | | | | |
|---|---|---------|--|-------------------------------------|
| | | | Schneidöl Cutting oil Huile de coupe Olio da taglio | |
| | | | 914 100 ⁴¹⁰ GH63-TiCN | 914 200 ⁴¹⁰ GH63-TiCN |
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | |
| Catalogue n° ^{W%} Nr. di catalogo ^{W%} | 8.2 50 - 63 HRC | | 8.2 50 - 63 HRC | |
| d ₁ [mm] P [mm] l ₁ [mm] l ₂ [mm] d ₂ [mm] l [mm] □ [mm] z Ø [mm] | Code | Code | ml | Code |
| M 3 0,5 46 11 3,5 6 2,7 4 2,55 | 140 100 | 140 120 | 50 | 130 300 |
| M 3,5 0,6 46 13 4 6 3 4 3 | 140 099 | 140 119 | 125 | 130 301 |
| M 4 0,7 52 13 4,5 6 3,4 4 3,4 | 140 101 | 140 121 | 500 | 130 302 |
| M 5 0,8 60 16 6 8 4,9 4 4,3 | 140 102 | 140 122 | | |
| M 6 1 62 19 6 8 4,9 5 5,1 | 140 103 | 140 123 | | |
| M 8 1,25 70 22 6 8 4,9 5 6,9 | 140 104 | 140 124 | | |
| M 10 1,5 75 24 7 8 5,5 5 8,6 | 140 105 | 140 125 | | |
| M 12 1,75 82 29 9 10 7 5 10,4 | 140 106 | 140 126 | | |
| M 14 2 88 30 11 12 9 6 12,1 | 140 107 | 140 127 | | |
| M 16 2 95 32 12 12 9 6 14,1 | 140 108 | 140 128 | | |
| M 20 2,5 105 37 16 15 12 6 17,7 | 140 110 | 140 130 | | |
| M 8 x 1 70 22 6 8 4,9 5 7,1 | 140 150 | 140 200 | | |
| M 10 x 1 75 24 7 8 5,5 5 9,1 | 140 151 | 140 201 | | |
| M 12 x 1 82 29 9 10 7 5 11,1 | 140 152 | 140 202 | | |
| M 12 x 1,5 82 29 9 10 7 5 10,6 | 140 155 | 140 205 | | |
| M 14 x 1,5 88 30 11 12 9 6 12,6 | 140 158 | 140 208 | | |
| M 16 x 1,5 95 32 12 12 9 6 14,6 | 140 160 | 140 210 | | |
| M 20 x 1,5 105 37 16 15 12 6 18,6 | 140 165 | 140 215 | | |
| P [Gg/1""] d ₁ [mm] l ₁ [mm] l ₂ [mm] d ₂ [mm] □ [mm] z Ø [mm] | | | | |
| G 1/8 28 9,73 63 18 7 5,5 5 8,9 | 140 250 | 140 300 | | |
| G 1/4 19 13,16 70 20 11 9 5 11,9 | 140 251 | 140 301 | | |

M
MF
G

VHM



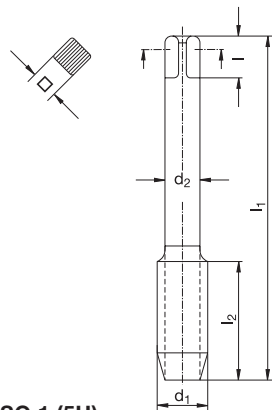
|  | | | GH53 954 100 954 200 | | GH63 914 100 914 200 | | | | | |
|---|------|-----------|---------------------------------------|----------------------------|---------------------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|
| MAT | | | 8.2 42~53 HRC | | 8.2 | | | | | |
| V _c | | | 2,5 m/min | | 2,5 m/min | | 2,0 m/min | | 1,8 m/min | |
| d ₁ | P | ∅ [mm] | n [min ⁻¹] | v _f [mm/min] | n [min ⁻¹] | v _f [mm/min] | n [min ⁻¹] | v _f [mm/min] | n [min ⁻¹] | v _f [mm/min] |
| M 3 | 0,5 | 2,55 | 265 | 133 | 265 | 133 | 212 | 106 | 191 | 95 |
| M 3,5 | 0,6 | 3 | 227 | 136 | 227 | 136 | 182 | 109 | 164 | 98 |
| M 4 | 0,7 | 3,4 | 199 | 139 | 199 | 139 | 159 | 111 | 143 | 100 |
| M 5 | 0,8 | 4,3 | 159 | 127 | 159 | 127 | 127 | 102 | 115 | 92 |
| M 6 | 1 | 5,1 | 133 | 133 | 133 | 133 | 106 | 106 | 95 | 95 |
| M 8 | 1,25 | 6,9 | 99 | 124 | 99 | 124 | 80 | 99 | 72 | 90 |
| M10 | 1,5 | 8,6 | 80 | 119 | 80 | 119 | 64 | 95 | 57 | 86 |
| M12 | 1,75 | 10,4 | 66 | 116 | 66 | 116 | 53 | 93 | 48 | 84 |
| M14 | 2 | 12,1 | 57 | 114 | 57 | 114 | 45 | 91 | 41 | 82 |
| M16 | 2 | 14,1 | 50 | 99 | 50 | 99 | 40 | 80 | 36 | 72 |
| M20 | 2,5 | 17,7 | 40 | 99 | 40 | 99 | 32 | 80 | 29 | 72 |
| M24 | 3 | 21,2 | 33 | 99 | 33 | 99 | 27 | 80 | 24 | 72 |
| M 8x0,75 | 0,75 | 7,3 | 99 | 75 | 99 | 75 | 80 | 60 | 72 | 54 |
| M 8x1 | 1 | 7,1 | 99 | 99 | 99 | 99 | 80 | 80 | 72 | 72 |
| M10x1 | 1 | 9,1 | 80 | 80 | 80 | 80 | 64 | 64 | 57 | 57 |
| M12x1 | 1 | 11,1 | 66 | 66 | 66 | 66 | 53 | 53 | 48 | 48 |
| M12x1,5 | 1,5 | 10,6 | 66 | 99 | 66 | 99 | 53 | 80 | 48 | 72 |
| M14x1,5 | 1,5 | 12,6 | 57 | 85 | 57 | 85 | 45 | 68 | 41 | 61 |
| M16x1,5 | 1,5 | 14,6 | 50 | 75 | 50 | 75 | 40 | 60 | 36 | 54 |
| M20x1,5 | 1,5 | 18,6 | 40 | 60 | 40 | 60 | 32 | 48 | 29 | 43 |
| G 1/8" | 28 | 8,9 | 82 | 74 | 82 | 74 | 65 | 59 | 59 | 53 |
| G 1/4" | 19 | 11,9 | 60 | 81 | 60 | 81 | 48 | 65 | 44 | 58 |
| G 3/8" | 19 | 15,4 | 48 | 64 | 48 | 64 | 38 | 51 | 34 | 46 |

Einsatzbedingungen
Conditions d'utilisation

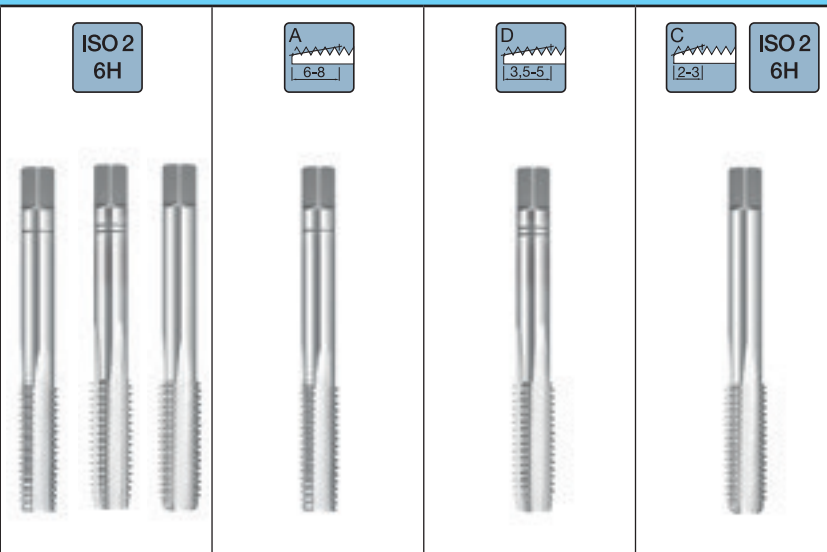
Cutting conditions
Condizioni d'uso

- Als Schmiermittel sollten wasserunlösliche Schneidöle verwendet werden.
Water-insoluble oil is recommended for this application.
Toujours utiliser de l'huile entière.
Per queste lavorazioni si raccomanda olio da taglio intero.
- Nach jedem Gewinde müssen hängengebliebene Späne am Gewindebohrer entfernt werden.
After each tapped thread, all stuck chips has to be removed from the tap.
Enlever les copeaux du taraud après chaque taraudage.
Dopo ogni filettatura eseguita, il maschio va ripulito dai trucioli.
- Bei Verwendung eines Gewindeschneidfutters mit Drehmomentkupplung muss der Wert des Drehmoments auf Maximal eingestellt werden. Vorzugsweise sollten Schnellwechseleinsätze ohne Drehmomentkupplung verwendet werden.
By using a tap holder with overload clutch, the overload torque has to be adjusted on its maximum. The usage of a quick change tap holder without overload clutch is recommended for this application.
En utilisant des adaptateurs avec limiteur de couple, la valeur du couple doit être réglée au maximum.
Se si utilizza un maschiatore con frizione, prego regolare la frizione al massimo del momento torcente. Si consiglia di utilizzare un maschiatore senza frizione.
- Es sollte auf keinen Fall mit der Hand geschnitten werden.
In no case, the tap should be used by hand.
Ne jamais tarauder à la main.
Il maschio non e' adatto alle maschiature a mano.
- Die maximale Gewindetiefe beträgt 1,5 x d.
The maximum thread depth is 1,5 x d.
La profondeur de taraudage ne doit pas dépasser 1.5 x d.
La profondità massima di maschiatura e' 1,5 x d.
- Beim Einsatz von Maschinen mit synchronisierter Spindel kann der Gewindebohrer starr gespannt werden und die angegebenen Schnittwerte können um ca. 10% erhöht werden.
In case of using a machining center with synchronized tapping possibility, the tap should be clamped in a rigid tap holder. In such case, tapping speed can be increased by approx. 10%.
Sur centre d'usinage avec avance synchronisée on peut utiliser un serrage fixe et on peut augmenter les conditions de coupe de 10% environ.
In caso di utilizzo su CNC con maschiatura rigida, usando un maschiatore senza compensazione (rigido), la velocità di taglio può essere aumentata del 10%.

M Typ N HSS DIN 352 60° P DIN 13 ≤ 2,5xd ≤ 800 N/mm²



* = ISO 1 (5H)



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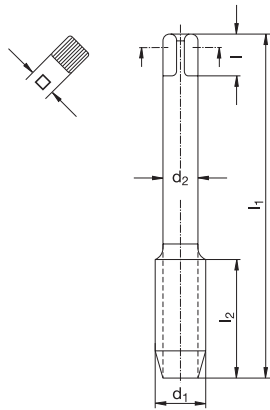


| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 352 000 ¹⁵⁰ | | 352 000 V ¹⁵⁰ | | 352 000 M ¹⁵⁰ | | 352 000 F ¹⁵⁰ | |
|--|-----------|--|------------------------|---|-----------|---|-----------|---|---------|---|---------|
| Catalogue n° ^{W%} | | Nr. di catalogo ^{W%} | | Satz, Set, Kit, Serie | | # 1 (V) | | # 2 (M) | | # 3 (F) | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | ∅ [mm] | Code | Code | Code | Code |
| M 1 * | 0,25 | 32 | 5,5 | 2,5 | 5 | 2,1 | 0,75 | 100 301 | 100 001 | 100 101 | 100 201 |
| M 1,1* | 0,25 | 32 | 5,5 | 2,5 | 5 | 2,1 | 0,85 | 100 302 | 100 002 | 100 102 | 100 202 |
| M 1,2* | 0,25 | 32 | 5,5 | 2,5 | 5 | 2,1 | 0,95 | 100 303 | 100 003 | 100 103 | 100 203 |
| M 1,4* | 0,3 | 32 | 7 | 2,5 | 5 | 2,1 | 1,1 | 100 304 | 100 004 | 100 104 | 100 204 |
| M 1,6 | 0,35 | 32 | 8 | 2,5 | 5 | 2,1 | 1,25 | 100 305 | 100 005 | 100 105 | 100 205 |
| M 1,7 | 0,35 | 32 | 8 | 2,5 | 5 | 2,1 | 1,3 | 100 306 | 100 006 | 100 106 | 100 206 |
| M 1,8 | 0,35 | 32 | 8 | 2,5 | 5 | 2,1 | 1,45 | 100 307 | 100 007 | 100 107 | 100 207 |
| M 2 | 0,4 | 36 | 8 | 2,8 | 5 | 2,1 | 1,6 | 100 308 | 100 008 | 100 108 | 100 208 |
| M 2,2 | 0,45 | 36 | 9 | 2,8 | 5 | 2,1 | 1,75 | 100 309 | 100 009 | 100 109 | 100 209 |
| M 2,3 | 0,4 | 36 | 9 | 2,8 | 5 | 2,1 | 1,9 | 100 310 | 100 010 | 100 110 | 100 210 |
| M 2,5 | 0,45 | 40 | 9 | 2,8 | 5 | 2,1 | 2,05 | 100 311 | 100 011 | 100 111 | 100 211 |
| M 2,6 | 0,45 | 40 | 9 | 2,8 | 5 | 2,1 | 2,1 | 100 312 | 100 012 | 100 112 | 100 212 |
| M 3 | 0,5 | 40 | 11 | 3,5 | 6 | 2,7 | 2,5 | 100 313 | 100 013 | 100 113 | 100 213 |
| M 3,5 | 0,6 | 45 | 12 | 4 | 6 | 3 | 2,9 | 100 314 | 100 014 | 100 114 | 100 214 |
| M 4 | 0,7 | 45 | 13 | 4,5 | 6 | 3,4 | 3,3 | 100 315 | 100 015 | 100 115 | 100 215 |
| M 4,5 | 0,75 | 50 | 16 | 6 | 8 | 4,9 | 3,7 | 100 316 | 100 016 | 100 116 | 100 216 |
| M 5 | 0,8 | 50 | 16 | 6 | 8 | 4,9 | 4,2 | 100 317 | 100 017 | 100 117 | 100 217 |
| M 6 | 1 | 56 | 19 | 6 | 8 | 4,9 | 5 | 100 318 | 100 018 | 100 118 | 100 218 |
| M 7 | 1 | 56 | 19 | 6 | 8 | 4,9 | 6 | 100 319 | 100 019 | 100 119 | 100 219 |
| M 8 | 1,25 | 63 | 22 | 6 | 8 | 4,9 | 6,8 | 100 320 | 100 020 | 100 120 | 100 220 |
| M 9 | 1,25 | 63 | 22 | 7 | 8 | 5,5 | 7,8 | 100 321 | 100 021 | 100 121 | 100 221 |
| M 10 | 1,5 | 70 | 24 | 7 | 8 | 5,5 | 8,5 | 100 322 | 100 022 | 100 122 | 100 222 |
| M 11 | 1,5 | 70 | 24 | 8 | 9 | 6,2 | 9,5 | 100 323 | 100 023 | 100 123 | 100 223 |
| M 12 | 1,75 | 75 | 28 | 9 | 10 | 7 | 10,2 | 100 324 | 100 024 | 100 124 | 100 224 |
| M 14 | 2 | 80 | 30 | 11 | 12 | 9 | 12 | 100 325 | 100 025 | 100 125 | 100 225 |
| M 16 | 2 | 80 | 32 | 12 | 12 | 9 | 14 | 100 326 | 100 026 | 100 126 | 100 226 |
| M 18 | 2,5 | 95 | 34 | 14 | 14 | 11 | 15,5 | 100 327 | 100 027 | 100 127 | 100 227 |
| M 20 | 2,5 | 95 | 34 | 16 | 15 | 12 | 17,5 | 100 328 | 100 028 | 100 128 | 100 228 |
| M 22 | 2,5 | 100 | 34 | 18 | 17 | 14,5 | 19,5 | 100 329 | 100 029 | 100 129 | 100 229 |
| M 24 | 3 | 110 | 38 | 18 | 17 | 14,5 | 21 | 100 330 | 100 030 | 100 130 | 100 230 |
| M 27 | 3 | 110 | 38 | 20 | 19 | 16 | 24 | 100 331 | 100 031 | 100 131 | 100 231 |
| M 30 | 3,5 | 125 | 45 | 22 | 21 | 18 | 26,5 | 100 332 | 100 032 | 100 132 | 100 232 |

M Typ N LH HSS DIN 352 60° DIN 13 ≤ 800 N/mm²

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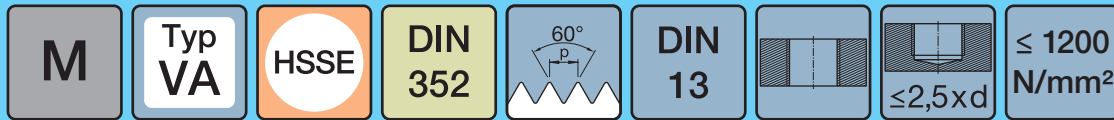
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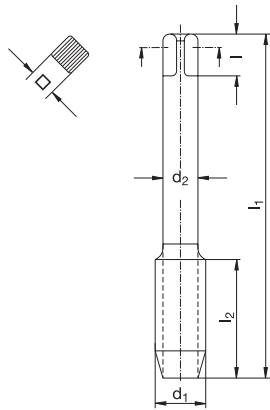


| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 352 008 ¹⁵⁰ | | 352 008 V ¹⁵⁰ | | 352 008 M ¹⁵⁰ | | 352 008 F ¹⁵⁰ | |
|--|-----------|--|------------------------|---|-----------|---|-----------|---|----------|---|----------|
| Catalogue n° ^{W%} | | Nr. di catalogo ^{W%} | | Satz, Set, Kit, Serie | | # 1 (V) | | # 2 (M) | | # 3 (F) | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | Ø [mm] | Code | Code | Code | Code |
| M 3 | 0,5 | 40 | 11 | 3,5 | 6 | 2,7 | 2,5 | 101 600 | 101 620 | 101 640 | 101 660 |
| M 4 | 0,7 | 45 | 13 | 4,5 | 6 | 3,4 | 3,3 | 101 601 | 101 621 | 101 641 | 101 661 |
| M 5 | 0,8 | 50 | 16 | 6 | 8 | 4,9 | 4,2 | 101 602 | 101 622 | 101 642 | 101 662 |
| M 6 | 1 | 56 | 19 | 6 | 8 | 4,9 | 5 | 101 603 | 101 623 | 101 643 | 101 663 |
| M 8 | 1,25 | 63 | 22 | 6 | 8 | 4,9 | 6,8 | 101 604 | 101 624 | 101 644 | 101 664 |
| M 10 | 1,5 | 70 | 24 | 7 | 8 | 5,5 | 8,5 | 101 605 | 101 625 | 101 645 | 101 665 |
| M 12 | 1,75 | 75 | 28 | 9 | 10 | 7 | 10,2 | 101 606 | 101 626 | 101 646 | 101 666 |
| M 16 | 2 | 80 | 32 | 12 | 12 | 9 | 14 | 101 608 | 101 628 | 101 648 | 101 668 |
| M 20 | 2,5 | 95 | 34 | 16 | 15 | 12 | 17,5 | 101 610 | 101 630 | 101 650 | 101 670 |



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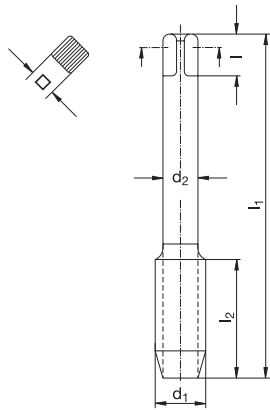
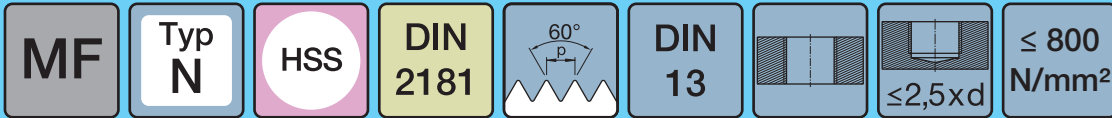
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| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 352 503 ¹⁵⁰ | | 352 503 V ¹⁵⁰ | | 352 503 M ¹⁵⁰ | | 352 503 F ¹⁵⁰ | |
|--|-----------|--|------------------------|---|-----------|---|-----------|---|----------|---|----------|
| Catalogue n° ^{W%} | | Nr. di catalogo ^{W%} | | Satz, Set, Kit, Serie | | # 1 (V) | | # 2 (M) | | # 3 (F) | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | Ø [mm] | Code | Code | Code | Code |
| M 2 | 0,4 | 36 | 8 | 2,8 | 5 | 2,1 | 1,6 | 101 520 | 101 400 | 100 440 | 100 480 |
| M 2,5 | 0,45 | 40 | 9 | 2,8 | 5 | 2,1 | 2,05 | 101 523 | 101 403 | 100 443 | 100 483 |
| M 3 | 0,5 | 40 | 11 | 3,5 | 6 | 2,7 | 2,5 | 101 525 | 101 405 | 100 445 | 100 485 |
| M 3,5 | 0,6 | 45 | 12 | 4 | 6 | 3 | 2,9 | 101 526 | 101 406 | 100 446 | 100 486 |
| M 4 | 0,7 | 45 | 13 | 4,5 | 6 | 3,4 | 3,3 | 101 527 | 101 407 | 100 447 | 100 487 |
| M 5 | 0,8 | 50 | 16 | 6 | 8 | 4,9 | 4,2 | 101 528 | 101 408 | 100 448 | 100 488 |
| M 6 | 1 | 56 | 19 | 6 | 8 | 4,9 | 5 | 101 529 | 101 409 | 100 449 | 100 489 |
| M 8 | 1,25 | 63 | 22 | 6 | 8 | 4,9 | 6,8 | 101 530 | 101 410 | 100 450 | 100 490 |
| M 10 | 1,5 | 70 | 24 | 7 | 8 | 5,5 | 8,5 | 101 531 | 101 411 | 100 451 | 100 491 |
| M 12 | 1,75 | 75 | 28 | 9 | 10 | 7 | 10,2 | 101 532 | 101 412 | 100 452 | 100 492 |
| M 14 | 2 | 80 | 30 | 11 | 12 | 9 | 12 | 101 533 | 101 413 | 100 453 | 100 493 |
| M 16 | 2 | 80 | 32 | 12 | 12 | 9 | 14 | 101 534 | 101 414 | 100 454 | 100 494 |



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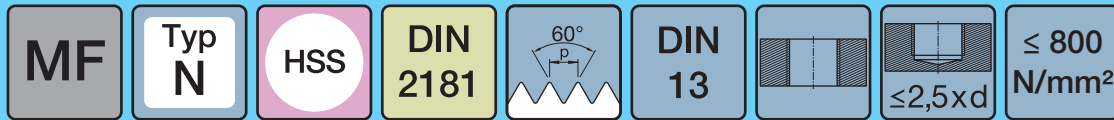


| | | | | |
|-----------------------------------|--------------------------------------|-------------------------------|---------------------------------|---------------------------------|
| Katalog-Nr. ^{W%} | Catalogue no. ^{W%} | 181 000 ¹⁵⁰ | 181 000 V ¹⁵⁰ | 181 000 F ¹⁵⁰ |
| Catalogue n° ^{W%} | Nr. di catalogo ^{W%} | Satz, Set, Kit, Serie | # 1 (V) | # 2 (F) |

| | | | | |
|---|--|---|---|---|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 |
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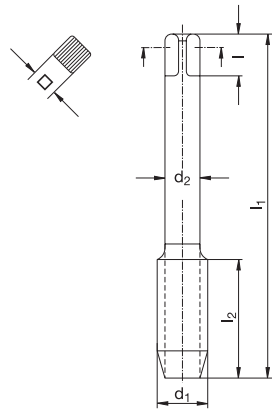
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|------------------------------|------------------|------------------------------|------------------------------|------------------------------|------------------|------------------|------------------|-----------------|-----------------|-----------------|
| d₁ [mm] | P [mm] | l₁ [mm] | l₂ [mm] | d₂ [mm] | l [mm] | □ [mm] | Ø [mm] | Code | Code | Code |
|------------------------------|------------------|------------------------------|------------------------------|------------------------------|------------------|------------------|------------------|-----------------|-----------------|-----------------|

| | | | | | | | | | |
|-------------|----|----|-----|----|-----|------|---------|---------|---------|
| M 3 x 0,35 | 40 | 8 | 3,5 | 6 | 2,7 | 2,65 | 100 746 | 100 546 | 100 646 |
| M 4 x 0,5 | 45 | 10 | 4,5 | 6 | 3,4 | 3,5 | 100 749 | 100 549 | 100 649 |
| M 5 x 0,5 | 50 | 12 | 6 | 8 | 4,9 | 4,5 | 100 750 | 100 550 | 100 650 |
| M 6 x 0,5 | 56 | 14 | 6 | 8 | 4,9 | 5,5 | 100 751 | 100 551 | 100 651 |
| M 6 x 0,75 | 56 | 14 | 6 | 8 | 4,9 | 5,3 | 100 752 | 100 552 | 100 652 |
| M 8 x 0,5 | 56 | 18 | 6 | 8 | 4,9 | 7,5 | 100 754 | 100 554 | 100 654 |
| M 8 x 0,75 | 56 | 18 | 6 | 8 | 4,9 | 7,3 | 100 755 | 100 555 | 100 655 |
| M 8 x 1 | 63 | 22 | 6 | 8 | 4,9 | 7 | 100 756 | 100 556 | 100 656 |
| M 10 x 0,75 | 63 | 20 | 7 | 8 | 5,5 | 9,3 | 100 758 | 100 558 | 100 658 |
| M 10 x 1 | 63 | 20 | 7 | 8 | 5,5 | 9 | 100 759 | 100 559 | 100 659 |
| M 10 x 1,25 | 70 | 24 | 7 | 8 | 5,5 | 8,8 | 100 760 | 100 560 | 100 660 |
| M 11 x 1 | 63 | 20 | 8 | 9 | 6,2 | 10 | 100 761 | 100 561 | 100 661 |
| M 12 x 1 | 70 | 22 | 9 | 10 | 7 | 11 | 100 762 | 100 562 | 100 662 |
| M 12 x 1,25 | 70 | 22 | 9 | 10 | 7 | 10,8 | 100 763 | 100 563 | 100 663 |
| M 12 x 1,5 | 70 | 22 | 9 | 10 | 7 | 10,5 | 100 764 | 100 564 | 100 664 |
| M 14 x 1 | 70 | 22 | 11 | 12 | 9 | 13 | 100 765 | 100 565 | 100 665 |
| M 14 x 1,25 | 70 | 22 | 11 | 12 | 9 | 12,8 | 100 766 | 100 566 | 100 666 |
| M 14 x 1,5 | 70 | 22 | 11 | 12 | 9 | 12,5 | 100 768 | 100 567 | 100 667 |
| M 15 x 1,5 | 70 | 22 | 12 | 12 | 9 | 13,5 | 100 770 | 100 569 | 100 669 |
| M 16 x 1 | 70 | 22 | 12 | 12 | 9 | 15 | 100 771 | 100 570 | 100 670 |
| M 16 x 1,5 | 70 | 22 | 12 | 12 | 9 | 14,5 | 100 772 | 100 571 | 100 671 |
| M 18 x 1 | 80 | 22 | 14 | 14 | 11 | 17 | 100 773 | 100 572 | 100 672 |
| M 18 x 1,5 | 80 | 22 | 14 | 14 | 11 | 16,5 | 100 774 | 100 573 | 100 673 |
| M 18 x 2 | 80 | 22 | 14 | 14 | 11 | 16 | 100 775 | 100 574 | 100 674 |
| M 20 x 1 | 80 | 22 | 16 | 15 | 12 | 19 | 100 776 | 100 575 | 100 675 |
| M 20 x 1,5 | 80 | 22 | 16 | 15 | 12 | 18,5 | 100 777 | 100 576 | 100 676 |



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Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n° ^{W%}
Nr. di catalogo ^{W%}

181 000 ¹⁵⁰
Satz, Set, Kit, Serie

181 000 V ¹⁵⁰
1 (V)

181 000 F ¹⁵⁰
2 (F)

Werkstoffgruppen
Groupes de matières

1.1-1.3; 3.1; 3.3; 3.4;
4.1-4.3; 7.1

1.1-1.3; 3.1; 3.3; 3.4;
4.1-4.3; 7.1

1.1-1.3; 3.1; 3.3; 3.4;
4.1-4.3; 7.1

Classification of work materials
Gruppo materiali

Code

Code

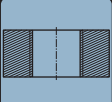
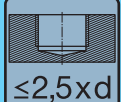
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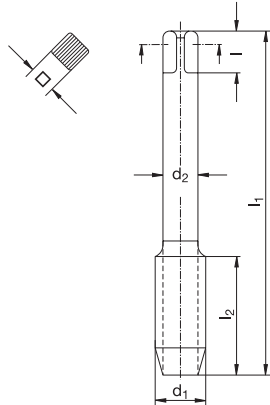



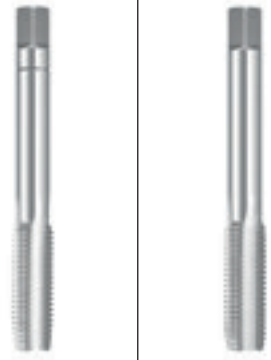



| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | Ø [mm] |
|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|-----------|
| M22 x 1,5 | 80 | 22 | 18 | 17 | 14,5 | 20,5 | |
| M24 x 1,5 | 90 | 22 | 18 | 17 | 14,5 | 22,5 | |
| M24 x 2 | 90 | 22 | 18 | 17 | 14,5 | 22 | |
| M26 x 1,5 | 90 | 22 | 18 | 17 | 14,5 | 24,5 | |
| M27 x 1,5 | 90 | 22 | 20 | 19 | 16 | 25,5 | |
| M28 x 1,5 | 90 | 22 | 20 | 19 | 16 | 26,5 | |
| M30 x 1,5 | 90 | 22 | 22 | 21 | 18 | 28,5 | |
| M30 x 2 | 90 | 22 | 22 | 21 | 18 | 28 | |

| Code |
|---------|
| 100 780 |
| 100 783 |
| 100 784 |
| 100 786 |
| 100 787 |
| 100 789 |
| 100 791 |
| 100 792 |

| Code |
|---------|
| 100 579 |
| 100 582 |
| 100 583 |
| 100 585 |
| 100 586 |
| 100 588 |
| 100 590 |
| 100 591 |

| Code |
|---------|
| 100 679 |
| 100 682 |
| 100 683 |
| 100 685 |
| 100 686 |
| 100 688 |
| 100 690 |
| 100 691 |

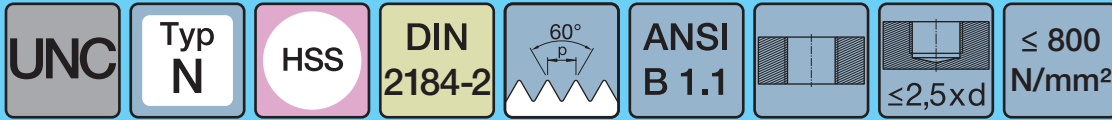
| | | | | | | | | |
|----------|--------------|------------|-----------------|----------|--------------------|---|--|----------------------------|
| G | Typ N | HSS | DIN 5157 | 55° P | DIN ISO 228 |  |  ≤2,5xd | ≤ 800 N/mm ² |
|----------|--------------|------------|-----------------|----------|--------------------|---|--|----------------------------|

| | | | | | | | | | | | |
|---|---|--|---------------------------------|---|---|------------------|------------------|--|--|--|---------|
|  | |   | |   | | | | | | | |
| | | 353 000 ¹⁵⁰ | 353 000 V ¹⁵⁰ | 353 000 F ¹⁵⁰ | | | | | | | |
| Katalog-Nr. ^{W%} | Catalogue no. ^{W%} | Satz, Set, Kit, Serie | | # 1 (V) | # 2 (F) | | | | | | |
| Catalogue n° ^{W%} | Nr. di catalogo ^{W%} | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | | | | |
| P [Gg/mm] | d₁ [mm] | l₁ [mm] | l₂ [mm] | d₂ [mm] | l [mm] | □ [mm] | Ø [mm] | Code  | Code  | Code  | |
| G 1/8 | 28 | 9,728 | 63 | 20 | 7 | 8 | 5,5 | 8,8 | 101 071 | 101 011 | 101 041 |
| G 1/4 | 19 | 13,157 | 70 | 22 | 11 | 12 | 9 | 11,8 | 101 072 | 101 012 | 101 042 |
| G 3/8 | 19 | 16,662 | 70 | 22 | 12 | 12 | 9 | 15,25 | 101 073 | 101 013 | 101 043 |
| G 1/2 | 14 | 20,955 | 80 | 22 | 16 | 15 | 12 | 19 | 101 074 | 101 014 | 101 044 |
| G 5/8 | 14 | 22,911 | 80 | 22 | 18 | 17 | 14,5 | 21 | 101 075 | 101 015 | 101 045 |
| G 3/4 | 14 | 26,441 | 90 | 22 | 20 | 19 | 16 | 24,5 | 101 076 | 101 016 | 101 046 |

G

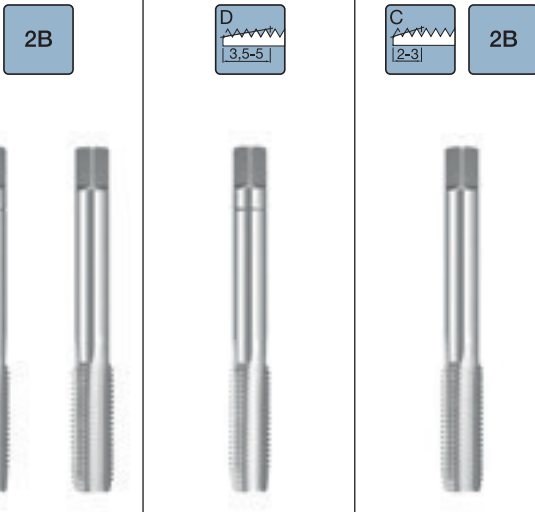
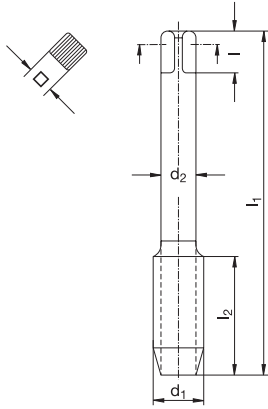
HSS





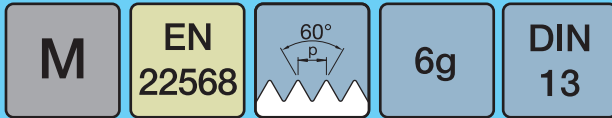
| UNC | | 2B | A 6-8 | D 3,5-5 | C 2-3 | 2B |
|-----|--|---|---|---|---|---------|
| | | | | | | |
| | | 902 000 ¹⁵⁰ | 902 000 V ¹⁵⁰ | 902 000 M ¹⁵⁰ | 902 000 F ¹⁵⁰ | |
| | | Satz, Set, Kit, Serie | # 1 (V) | # 2 (M) | # 3 (F) | |
| | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | |
| | | Code | Code | Code | Code | |
| | | # 5 - 40 3,175 40 11 3,5 6 2,7 2,65 | 101 225 | 101 105 | 101 145 | 101 185 |
| | | # 6 - 32 3,505 45 12 4 6 3 2,85 | 101 226 | 101 106 | 101 146 | 101 186 |
| | | # 8 - 32 4,166 45 13 4,5 6 3,4 3,5 | 101 227 | 101 107 | 101 147 | 101 187 |
| | | # 10 - 24 4,826 50 16 6 7 4,9 3,9 | 101 228 | 101 108 | 101 148 | 101 188 |
| | | 1/4" - 20 6,350 56 19 6 8 4,9 5,2 | 101 230 | 101 110 | 101 150 | 101 190 |
| | | 5/16" - 18 7,938 63 22 6 8 4,9 6,6 | 101 231 | 101 111 | 101 151 | 101 191 |
| | | 3/8" - 16 9,525 63 22 7 8 5,5 8 | 101 232 | 101 112 | 101 152 | 101 192 |
| | | 7/16" - 14 11,113 70 24 8 9 6,2 9,4 | 101 233 | 101 113 | 101 153 | 101 193 |
| | | 1/2" - 13 12,700 75 28 9 10 7 10,8 | 101 234 | 101 114 | 101 154 | 101 194 |
| | | 9/16" - 12 14,288 80 30 11 12 9 12,25 | 101 235 | 101 115 | 101 155 | 101 195 |
| | | 5/8" - 11 15,875 80 32 12 12 9 13,5 | 101 236 | 101 116 | 101 156 | 101 196 |
| | | 3/4" - 10 19,050 95 34 14 14 11 16,5 | 101 237 | 101 117 | 101 157 | 101 197 |

UNF Typ N HSS DIN 2184-2 60° ANSI B 1.1 ≤ 2,5xd ≤ 800 N/mm²



| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 903 000 ¹⁵⁰ | 903 000 V ¹⁵⁰ | 903 000 F ¹⁵⁰ | | | | | | |
|---|--|--|--------------------------|--------------------------|----|-----|------|---------|---------|---------|
| | | Satz, Set, Kit, Serie | # 1 (V) | # 2 (F) | | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | | | | |
| P d ₁ l ₁ l ₂ d ₂ l □ Ø | | Code | | | | | | | | |
| [Gg/mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | [mm] [mm] [mm] [mm] | | | | | | | | |
| # 6 - 40 | 3,505 | 45 | 9 | 4 | 6 | 3 | 2,95 | 101 347 | 101 267 | 101 307 |
| # 8 - 36 | 4,166 | 45 | 10 | 4,5 | 6 | 3,4 | 3,5 | 101 348 | 101 268 | 101 308 |
| # 10 - 32 | 4,826 | 50 | 12 | 6 | 7 | 4,9 | 4,1 | 101 349 | 101 269 | 101 309 |
| # 12 - 28 | 5,486 | 50 | 12 | 6 | 8 | 4,9 | 4,6 | 101 350 | 101 270 | 101 310 |
| 1/4" - 28 | 6,35 | 56 | 14 | 6 | 8 | 4,9 | 5,5 | 101 351 | 101 271 | 101 311 |
| 5/16" - 24 | 7,938 | 63 | 22 | 6 | 8 | 4,9 | 6,9 | 101 352 | 101 272 | 101 312 |
| 3/8" - 24 | 9,525 | 63 | 20 | 7 | 8 | 5,5 | 8,5 | 101 353 | 101 273 | 101 313 |
| 7/16" - 20 | 11,113 | 63 | 20 | 8 | 9 | 6,2 | 9,9 | 101 354 | 101 274 | 101 314 |
| 1/2" - 20 | 12,7 | 70 | 22 | 9 | 10 | 7 | 11,5 | 101 355 | 101 275 | 101 315 |
| 9/16" - 18 | 14,288 | 70 | 22 | 11 | 12 | 9 | 12,9 | 101 356 | 101 276 | 101 316 |
| 5/8" - 18 | 15,875 | 70 | 22 | 12 | 12 | 9 | 14,5 | 101 357 | 101 277 | 101 317 |
| 3/4" - 16 | 19,05 | 80 | 22 | 14 | 14 | 11 | 17,5 | 101 358 | 101 278 | 101 318 |

UNF
HSS



| M | | | | | Typ N | Typ N | Typ VA |
|---------|---|--|------------------------|------------------------|---|---|---|
| | | | | | HSS | HSS | HSSE PM |
| HSS | | | | | ≤ 800 N/mm ² | ≤ 800 N/mm ² | ≤ 1200 N/mm ² |
| HSSE-PM | | | | | LH | | |
| | | | | | | | |
| | Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | 223 000 ¹⁶⁰ | 223 008 ¹⁶⁰ | 223 003 ¹⁶⁰ |
| | Werkstoffgruppen Groupes de matières | | | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | 1; 2; 4.4; 4.5; 5.1; 5.2; 6.1; 6.2; 7.2; 7.3 |
| | d ₁ [mm] | P [mm] | d ₂ [mm] | h ₁ [mm] | Code | Code | Code |
| M 2 | 0,4 | 16 | 5 | 120 008 | | | |
| M 2,2 | 0,45 | 16 | 5 | 120 009 | | | |
| M 2,5 | 0,45 | 16 | 5 | 120 011 | | | |
| M 3 | 0,5 | 20 | 5 | 120 013 | 120 420 | 120 350 | |
| M 3,5 | 0,6 | 20 | 5 | 120 015 | | | |
| M 4 | 0,7 | 20 | 5 | 120 016 | 120 421 | 120 352 | |
| M 5 | 0,8 | 20 | 7 | 120 018 | 120 422 | 120 353 | |
| M 6 | 1 | 20 | 7 | 120 020 | 120 423 | 120 354 | |
| M 7 | 1 | 25 | 9 | 120 021 | | | |
| M 8 | 1,25 | 25 | 9 | 120 022 | 120 425 | 120 355 | |
| M 9 | 1,25 | 25 | 9 | 120 023 | | | |
| M 10 | 1,5 | 30 | 11 | 120 024 | 120 427 | 120 356 | |
| M 12 | 1,75 | 38 | 14 | 120 025 | 120 428 | 120 357 | |
| M 14 | 2 | 38 | 14 | 120 026 | 120 429 | 120 358 | |
| M 16 | 2 | 45 | 18 | 120 027 | 120 430 | 120 359 | |
| M 18 | 2,5 | 45 | 18 | 120 028 | 120 431 | 120 360 | |
| M 20 | 2,5 | 45 | 18 | 120 029 | 120 432 | 120 361 | |
| M 22 | 2,5 | 55 | 22 | 120 030 | | 120 362 | |
| M 24 | 3 | 55 | 22 | 120 031 | | | |
| M 27 | 3 | 65 | 25 | 120 032 | | | |
| M 30 | 3,5 | 65 | 25 | 120 033 | | | |



| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 223 100 ¹⁶⁰ | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 223 100 ¹⁶⁰ | | | |
|--|-----------|--|------------------------|--|------------------------|--|------------------------|------------------------|---------|
| Catalogue n ^o ^{W%} | | - | | Catalogue n ^o ^{W%} | | - | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | |
| 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 | | | |
| d ₁ [mm] | P [mm] | d ₂ [mm] | h ₁ [mm] | Code | d ₁ [mm] | P [mm] | d ₂ [mm] | h ₁ [mm] | Code |
| M 3 | x 0,35 | 20 | 5 | 120 073 | M 18 | x 1 | 45 | 14 | 120 098 |
| M 3,5 | x 0,35 | 20 | 5 | 120 074 | M 18 | x 1,5 | 45 | 14 | 120 099 |
| M 4 | x 0,5 | 20 | 5 | 120 075 | M 20 | x 1 | 45 | 14 | 120 101 |
| M 5 | x 0,5 | 20 | 5 | 120 076 | M 20 | x 1,5 | 45 | 14 | 120 102 |
| M 6 | x 0,5 | 20 | 5 | 120 077 | M 22 | x 1 | 55 | 16 | 120 104 |
| M 6 | x 0,75 | 20 | 7 | 120 078 | M 22 | x 1,5 | 55 | 16 | 120 105 |
| M 7 | x 0,75 | 25 | 9 | 120 079 | M 24 | x 1 | 55 | 16 | 120 107 |
| M 8 | x 0,5 | 25 | 9 | 120 080 | M 24 | x 1,5 | 55 | 16 | 120 108 |
| M 8 | x 0,75 | 25 | 9 | 120 081 | M 26 | x 1,5 | 55 | 16 | 120 110 |
| M 8 | x 1 | 25 | 9 | 120 082 | M 27 | x 1,5 | 65 | 18 | 120 111 |
| M 9 | x 1 | 25 | 9 | 120 083 | M 28 | x 1,5 | 65 | 18 | 120 113 |
| M 10 | x 0,75 | 30 | 11 | 120 084 | M 30 | x 1 | 65 | 18 | 120 114 |
| M 10 | x 1 | 30 | 11 | 120 085 | M 30 | x 1,5 | 65 | 18 | 120 115 |
| M 10 | x 1,25 | 30 | 11 | 120 086 | M 30 | x 2 | 65 | 18 | 120 116 |
| M 11 | x 1 | 30 | 11 | 120 087 | | | | | |
| M 12 | x 1 | 38 | 10 | 120 088 | | | | | |
| M 12 | x 1,25 | 38 | 10 | 120 089 | | | | | |
| M 12 | x 1,5 | 38 | 10 | 120 090 | | | | | |
| M 14 | x 1 | 38 | 10 | 120 091 | | | | | |
| M 14 | x 1,25 | 38 | 10 | 120 092 | | | | | |
| M 14 | x 1,5 | 38 | 10 | 120 093 | | | | | |
| M 15 | x 1 | 38 | 10 | 120 094 | | | | | |
| M 15 | x 1,5 | 38 | 10 | 120 095 | | | | | |
| M 16 | x 1 | 45 | 14 | 120 096 | | | | | |
| M 16 | x 1,5 | 45 | 14 | 120 097 | | | | | |

MF

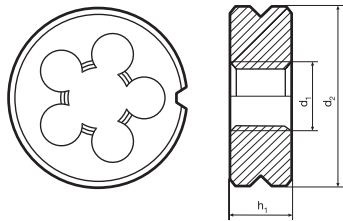
HSS



| | | | | | | |
|----------|--------------|-----------------|------------|---------|--------------------|---------------------------------|
| G | Typ N | EN 24231 | HSS | 55° | DIN ISO 228 | ≤ 800 N/mm ² |
|----------|--------------|-----------------|------------|---------|--------------------|---------------------------------|

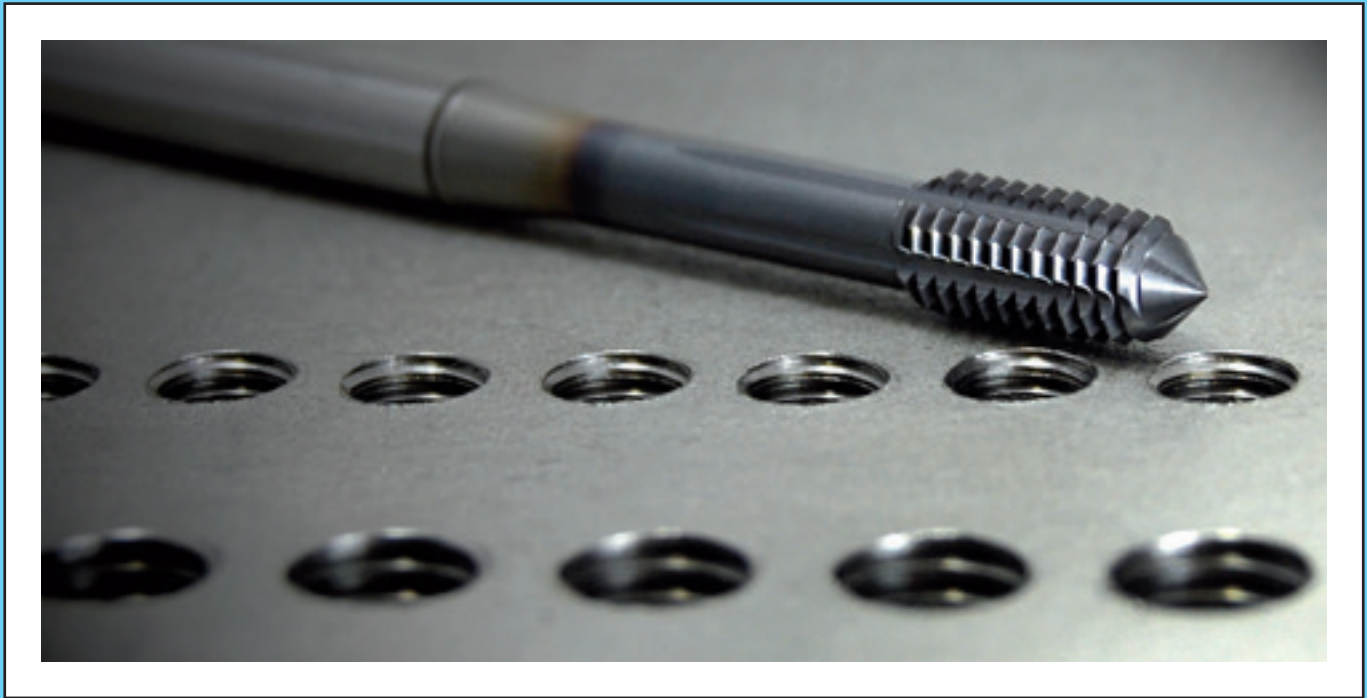
G

HSS



| | | | |
|---|--|------------------------------|---|
| Katalog-Nr. ^{W%} | Catalogue no. ^{W%} | | 223 300 ¹⁶⁰ |
| Catalogue n° ^{W%} | Nr. di catalogo ^{W%} | | - |
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | | 1.1-1.3; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 |
| | P [Gg/"] | d₂ [mm] | h₁ [mm] |
| G 1/8 | 28 | 30 | 11 |
| G 1/4 | 19 | 38 | 10 |
| G 3/8 | 19 | 45 | 14 |
| G 1/2 | 14 | 45 | 14 |
| G 5/8 | 14 | 55 | 16 |
| G 3/4 | 14 | 55 | 16 |



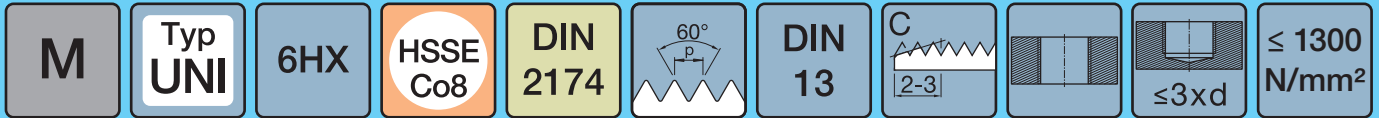


Schnittwertempfehlungen
Paramètres de coupe

Recommended cutting data
Parametri di taglio

| MAT | Werkstoffe · Work materials · Groupe matières · Materiale da lavorare | V _c | Typ UNI HSS-E | V _c | Typ VA HSS-E | V _c | Typ UNI VHM |
|-----------|---|----------------|------------------|----------------|-----------------|----------------|----------------|
| 1.1 | Baustähle (Rm < 800 N/mm ²) Structural steels (tensile strength < 800 N/mm ²) Acier de construction (Rm < 800 N/mm ²) Acciai (Rm < 800 N/mm ²) | 20 ~ 30 | ✓✓ | 15 ~ 30 | ✓✓ | 25 ~ 40 | ✓✓ |
| 1.2 | Unlegierte und niedriglegierte Stähle (Rm < 800 N/mm ²) Unalloyed and low-alloy steel (tensile strength < 800 N/mm ²) Acier non allié et faiblement allié (Rm < 800 N/mm ²) Acciai non legati e basso legati (Rm < 800 N/mm ²) | 20 ~ 30 | ✓✓ | 15 ~ 30 | ✓✓ | 25 ~ 40 | ✓✓ |
| 1.3 | Legierte Stähle (Rm < 800 N/mm ²) Alloyed steel (tensile strength < 800 N/mm ²) Acier allié (Rm < 800 N/mm ²) Acciai legati (Rm < 800 N/mm ²) | 20 ~ 30 | ✓✓✓ | 15 ~ 30 | ✓✓ | 25 ~ 40 | ✓✓✓ |
| 1.4 | Legierte, vergütete Stähle (Rm 800–1200 N/mm ²) Alloyed, Pre hardened steels (tensile strength 800–1200 N/mm ²) Acier allié et pré-traité (Rm 800–1200 N/mm ²) Acciai legati, acciai pre-tempra (Rm 800–1200 N/mm ²) | 8 ~ 15 | ✓✓✓ | | | | |
| 1.5 | Werkzeugstähle (Rm < 1300 N/mm ²) Tool steels (tensile strength < 1300 N/mm ²) Acier à outils (Rm < 1300 N/mm ²) Acciai da utensili (Rm < 1300 N/mm ²) | 8 ~ 15 | ✓✓✓ | | | | |
| 1.6 | Rost-, säure- und hitzebeständige Stähle Stainless, acid- and heatproof steels Aciers inoxydables, résistants aux acides et aciers réfractaires Acciai inossidabili – resistenti agli acidi e refrattari | | | 10 ~ 20 | ✓✓✓ | 12 ~ 20 | ✓✓✓ |
| 3.1 / 3.3 | Kupfer-Legierungen (langspanend) Copper-alloys (long chipping) Cuivre (copeaux longs) Leghe di rame (truciolo lungo) | 15 ~ 22 | ✓✓ | 22 ~ 50 | ✓✓✓ | 25 ~ 60 | ✓✓✓ |
| 3.4 | Kupfer-Sonderlegierungen (< 200 HB) Copper alloys (< 200 HB) Alliages de cuivre (< 200 HB) Leghe di Rame speciali (< 200 HB) | 20 ~ 40 | ✓✓ | 20 ~ 30 | ✓✓ | 25 ~ 40 | ✓✓ |
| 4.1 – 4.3 | Aluminium-Legierungen (~ 10% Si) Aluminium-alloys (~ 10% Si) Aluminium alliés (~ 10% Si) Leghe di alluminio (~ 10% Si) | 20 ~ 40 | ✓✓ | 30 ~ 70 | ✓✓ | 60 ~ 80 | ✓✓ |
| 7.1 | Thermoplaste Thermoplastics Thermoplastiques Termoplastiche | 20 ~ 40 | ✓✓ | 30 ~ 70 | ✓✓ | 60 ~ 80 | ✓✓ |

✓✓ gut / good / bon / buono
✓✓✓ hervorragend / exzellent / excellent / eccellente



| Katalog-Nr. ^{W%} 371 504 ⁴⁸⁰ Catalogue no. ^{W%} 371 504 ⁴⁸⁰ Catalogue n° ^{W%} 371 504 ⁴⁸⁰ Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 Code | | | | | | | | | | Katalog-Nr. ^{W%} 376 504 ⁴⁸⁰ Catalogue no. ^{W%} 376 504 ⁴⁸⁰ Catalogue n° ^{W%} 376 504 ⁴⁸⁰ Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 Code | | | | | | | | | | | |
|--|--------------------------------|--|--|--|--|--------------------------------|--------------------------------|------------------------|--------------------------------|--|--------------------------------|--|--|--|--------------------------------|--------------------------------|------------------------|--------------------------------|---------------------------|---------|--|
| ^{W%} TiCN | ^{W%} TiCN | | | | | | | | | | | | | | | | | | | | |
| ^{W%} Code | ^{W%} Code | | | | | | | | | | | | | | | | | | | | |
| ^{W%} d₁ [mm] | ^{W%} P [mm] | ^{W%} l₁ [mm] | ^{W%} l₂ [mm] | ^{W%} l₃ [mm] | ^{W%} d₂ [mm] | ^{W%} l [mm] | ^{W%} □ [mm] | ^{W%} z | ^{W%} ∅ [mm] | ^{W%} d₁ [mm] | ^{W%} P [mm] | ^{W%} l₁ [mm] | ^{W%} l₂ [mm] | ^{W%} d₂ [mm] | ^{W%} l [mm] | ^{W%} □ [mm] | ^{W%} z | ^{W%} ∅ [mm] | ^{W%} Code | | |
| M 1 | 0,25 | 40 | 5,5 | - | 2,5 | 5 | 2,1 | - | 0,9 | 485 601 | M 12 | 1,75 | 110 | 17 | 9 | 10 | 7 | 8 | 11,2 | 485 620 | |
| M 1,2 | 0,25 | 40 | 5,5 | - | 2,5 | 5 | 2,1 | - | 1,1 | 485 602 | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 8 | 13 | 485 621 | |
| M 1,4 | 0,3 | 40 | 7 | - | 2,5 | 5 | 2,1 | - | 1,27 | 485 603 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 8 | 15 | 485 622 | |
| M 1,6 | 0,35 | 40 | 8 | - | 2,5 | 5 | 2,1 | - | 1,45 | 485 604 | M 18 | 2,5 | 125 | 20 | 14 | 14 | 11 | 8 | 16,8 | 485 623 | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | - | 1,85 | 485 605 | M 20 | 2,5 | 140 | 20 | 16 | 15 | 12 | 8 | 18,8 | 485 624 | |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | - | 2,33 | 485 606 | M 22 | 2,5 | 140 | 20 | 18 | 17 | 14,5 | 8 | 20,8 | 485 625 | |
| M 3 | 0,5 | 56 | 8 | 18 | 3,5 | 6 | 2,7 | 4 | 2,8 | 485 607 | M 24 | 3 | 160 | 24 | 18 | 17 | 14,5 | 8 | 22,5 | 485 626 | |
| M 4 | 0,7 | 63 | 11 | 21 | 4,5 | 6 | 3,4 | 4 | 3,7 | 485 608 | M 27 | 3 | 160 | 18 | 20 | 19 | 16 | 8 | 25,5 | 485 627 | |
| M 5 | 0,8 | 70 | 12 | 25 | 6 | 8 | 4,9 | 5 | 4,65 | 485 609 | M 30 | 3,5 | 180 | 21 | 22 | 21 | 18 | 8 | 28,2 | 485 628 | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 5 | 5,55 | 485 610 | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 12 | 35 | 8 | 9 | 6,2 | 5 | 7,4 | 485 611 | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 8 | 9,3 | 485 612 | | | | | | | | | | | |

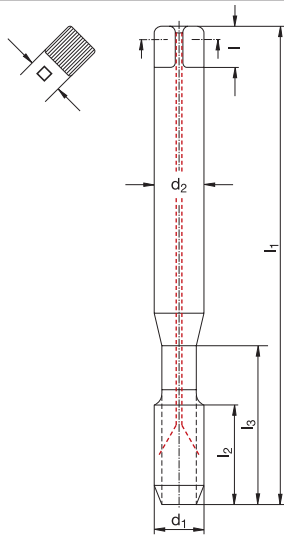
M
HSSE-
Co8



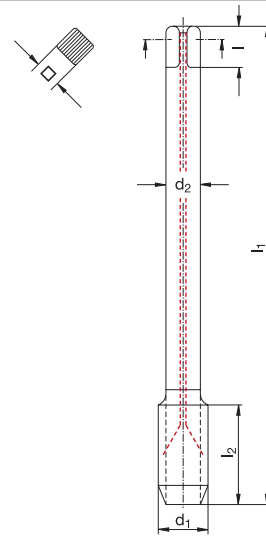
M Typ UNI 6HX HSSE Co8 DIN 2174 60° DIN 13 C 2-3 ≤ 3xd ≤ 1300 N/mm²

M

HSSE-Co8



IKR



IKR



Katalog-Nr.^{W%} Catalogue no.^{W%}
Catalogue n^o W% Nr. di catalogo^{W%}

371 754⁴⁸⁰
TiCN

Katalog-Nr.^{W%} Catalogue no.^{W%}
Catalogue n^o W% Nr. di catalogo^{W%}

376 754⁴⁸⁰
TiCN

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1.1 – 1.5; 3.1;
3.3; 4.1 – 4.3

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1.1 – 1.5; 3.1;
3.3; 4.1 – 4.3

d₁ P l₁ l₂ l₃ d₂ l □ z Ø
[mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm]

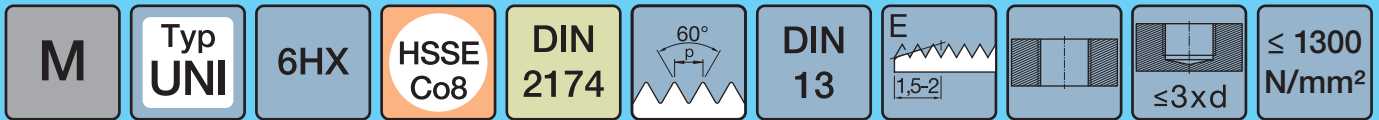
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d₁ P l₁ l₂ d₂ l □ z Ø
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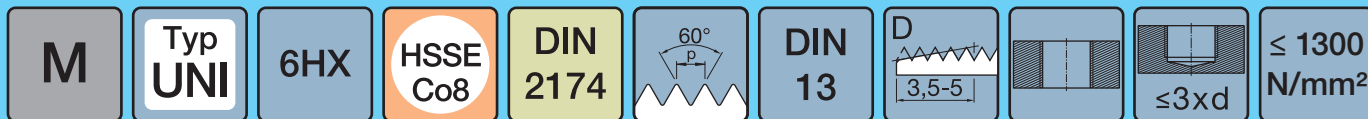
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| M 8 | 1,25 | 90 | 12 | 35 | 8 | 9 | 6,2 | 5 | 7,4 | 487 661 |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 8 | 9,3 | 487 662 |

| | | | | | | | | | |
|------|------|-----|----|----|----|------|---|------|---------|
| M 12 | 1,75 | 110 | 17 | 9 | 10 | 7 | 8 | 11,2 | 487 663 |
| M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 8 | 13 | 487 664 |
| M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 8 | 15 | 487 665 |
| M 18 | 2,5 | 125 | 20 | 14 | 14 | 11 | 8 | 16,8 | 487 666 |
| M 20 | 2,5 | 140 | 20 | 16 | 15 | 12 | 8 | 18,8 | 487 667 |
| M 22 | 2,5 | 140 | 20 | 18 | 17 | 14,5 | 8 | 20,8 | 487 668 |
| M 24 | 3 | 160 | 24 | 18 | 17 | 14,5 | 8 | 22,5 | 487 669 |
| M 27 | 3 | 160 | 18 | 20 | 19 | 16 | 8 | 25,5 | 487 670 |
| M 30 | 3,5 | 180 | 21 | 22 | 21 | 18 | 8 | 28,2 | 487 671 |
| M 33 | 3,5 | 180 | 21 | 25 | 23 | 20 | 8 | 31,2 | 487 672 |
| M 36 | 4 | 200 | 24 | 28 | 25 | 22 | 8 | 33,9 | 487 673 |
| M 39 | 4 | 200 | 24 | 32 | 27 | 24 | 9 | 36,9 | 487 674 |
| M 42 | 4,5 | 200 | 27 | 32 | 27 | 24 | 9 | 39,6 | 487 675 |
| M 45 | 4,5 | 220 | 27 | 36 | 32 | 29 | 9 | 42,6 | 487 676 |



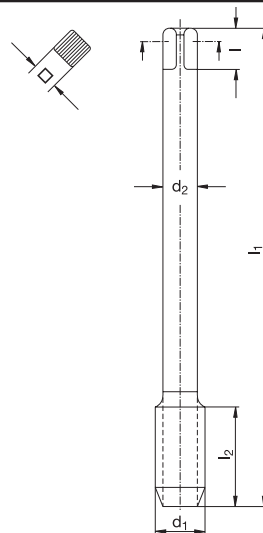
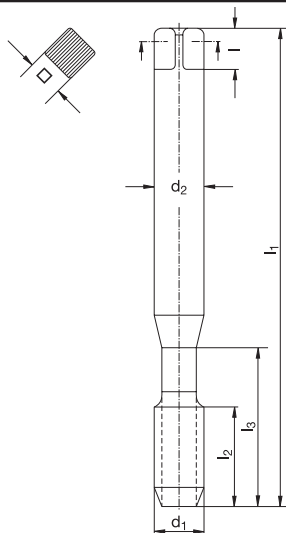
| d ₁ , P, l ₁ , l ₂ , l ₃ , d ₂ , l, □, z, Ø | | | | | | | | | | d ₁ , P, l ₁ , l ₂ , d ₂ , l, □, z, Ø | | | | | | | | | | |
|--|------|--|----|-----------------------------------|-----|--|-----|--|------|---|------|------|-----|----|----|----|---|---|------|---------|
| Katalog-Nr. ^{W%} Catalogue n ^o W% | | Catalogue no. ^{W%} Nr. di catalogo W% | | 371 204 ⁴⁸⁰ TiCN | | Katalog-Nr. ^{W%} Catalogue n ^o W% | | Catalogue no. ^{W%} Nr. di catalogo W% | | 376 204 ⁴⁸⁰ TiCN | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 | | | | | | | | | | |
| d ₁ [mm] | | P [mm] | | l ₁ [mm] | | l ₂ [mm] | | l ₃ [mm] | | d ₂ [mm] | | | | | | | | | | |
| l [mm] | | □ [mm] | | z | | Ø [mm] | | Code | | Code | | | | | | | | | | |
| M 3 | 0,5 | 56 | 8 | 18 | 3,5 | 6 | 2,7 | 4 | 2,8 | 485 825 | M 12 | 1,75 | 110 | 17 | 9 | 10 | 7 | 8 | 11,2 | 485 831 |
| M 4 | 0,7 | 63 | 11 | 21 | 4,5 | 6 | 3,4 | 4 | 3,7 | 485 826 | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 8 | 13 | 485 832 |
| M 5 | 0,8 | 70 | 12 | 25 | 6 | 8 | 4,9 | 5 | 4,65 | 485 827 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 8 | 15 | 485 833 |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 5 | 5,55 | 485 828 | | | | | | | | | | |
| M 8 | 1,25 | 90 | 12 | 35 | 8 | 9 | 6,2 | 5 | 7,4 | 485 829 | | | | | | | | | | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 8 | 9,3 | 485 830 | | | | | | | | | | |





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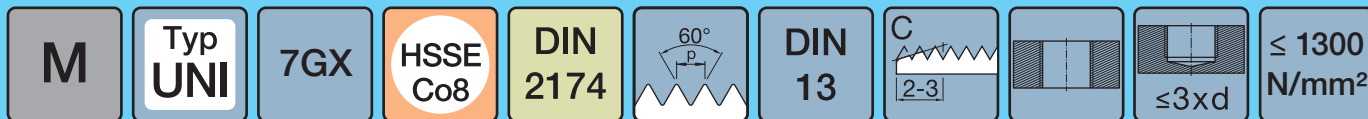


| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 371 604 ⁴⁸⁰ TiCN | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 376 604 ⁴⁸⁰ TiCN | | | | | | | | | | | | | | | |
|--|--|-----------------------------------|--|--|-----------------------------------|-----------|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | - | 1,85 | 485 750 | M 12 | 1,75 | 110 | 17 | 9 | 10 | 7 | 8 | 11,2 | 485 758 |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | - | 2,33 | 485 751 | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 8 | 13 | 485 759 |
| M 3 | 0,5 | 56 | 8 | 18 | 3,5 | 6 | 2,7 | 4 | 2,8 | 485 752 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 8 | 15 | 485 760 |
| M 4 | 0,7 | 63 | 11 | 21 | 4,5 | 6 | 3,4 | 4 | 3,7 | 485 753 | | | | | | | | | | |
| M 5 | 0,8 | 70 | 12 | 25 | 6 | 8 | 4,9 | 5 | 4,65 | 485 754 | | | | | | | | | | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 5 | 5,55 | 485 755 | | | | | | | | | | |
| M 8 | 1,25 | 90 | 12 | 35 | 8 | 9 | 6,2 | 5 | 7,4 | 485 756 | | | | | | | | | | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 8 | 9,3 | 485 757 | | | | | | | | | | |



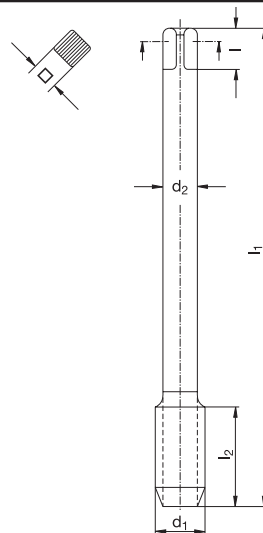
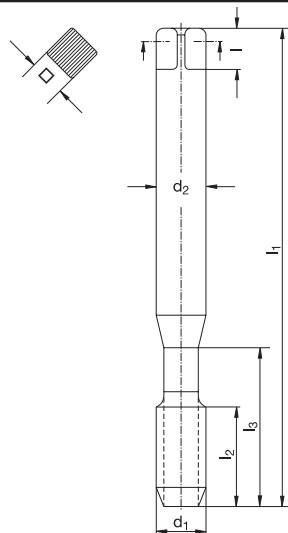
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|---|------------|-----|-------------|-------------|----------|-----------|----------|------|-----------------------------|
| M | Typ UNI | 6GX | HSSE Co8 | DIN 2174 | 60° P | DIN 13 | C 2-3 | ≤3xd | ≤ 1300 N/mm ² |
|---|------------|-----|-------------|-------------|----------|-----------|----------|------|-----------------------------|

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|------|----------------|----------------|----------------|--|------|------|------|------|-----------------------------------|---|----------------|----------------|----------------|---|---|---|---|---|--|------|------|------|------|-----------------------------------|------|------|--|------|-----|-----|----|---|----|-----|---|-----|---|------|-----|-----|----|----|----|-----|---|-----|---|------|-----|-----|----|----|----|---|---|-----|---|------|-----|---|----|----|----|---|---|-----|---|-----|-----|------|----|----|----|---|---|-----|---|------|------|-----|-----|----|----|----|----|---|---|------|---|--|--|--|--|--|--|--|--|--|----------------|---|----------------|----------------|----------------|---|---|---|---|------|------|------|------|------|------|------|--|------|------|------|-----|----|---|----|---|---|------|------|---|-----|----|----|----|---|---|----|------|---|-----|----|----|----|---|---|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | | | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | | | 371 564 ⁴⁸⁰ | | | | | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | | | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | | | 376 564 ⁴⁸⁰ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>d₁</th> <th>P</th> <th>l₁</th> <th>l₂</th> <th>l₃</th> <th>d₂</th> <th>l</th> <th>□</th> <th>z</th> <th>∅</th> </tr> <tr> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th></th> <th>[mm]</th> </tr> </thead> <tbody> <tr><td>M 3</td><td>0,5</td><td>56</td><td>8</td><td>18</td><td>3,5</td><td>6</td><td>2,7</td><td>4</td><td>2,83</td></tr> <tr><td>M 4</td><td>0,7</td><td>63</td><td>11</td><td>21</td><td>4,5</td><td>6</td><td>3,4</td><td>4</td><td>3,73</td></tr> <tr><td>M 5</td><td>0,8</td><td>70</td><td>12</td><td>25</td><td>6</td><td>8</td><td>4,9</td><td>5</td><td>4,68</td></tr> <tr><td>M 6</td><td>1</td><td>80</td><td>10</td><td>30</td><td>6</td><td>8</td><td>4,9</td><td>5</td><td>5,6</td></tr> <tr><td>M 8</td><td>1,25</td><td>90</td><td>12</td><td>35</td><td>8</td><td>9</td><td>6,2</td><td>5</td><td>7,45</td></tr> <tr><td>M 10</td><td>1,5</td><td>100</td><td>15</td><td>39</td><td>10</td><td>11</td><td>8</td><td>8</td><td>9,35</td></tr> </tbody> </table> | | | | | | | | | | d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | ∅ | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | M 3 | 0,5 | 56 | 8 | 18 | 3,5 | 6 | 2,7 | 4 | 2,83 | M 4 | 0,7 | 63 | 11 | 21 | 4,5 | 6 | 3,4 | 4 | 3,73 | M 5 | 0,8 | 70 | 12 | 25 | 6 | 8 | 4,9 | 5 | 4,68 | M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 5 | 5,6 | M 8 | 1,25 | 90 | 12 | 35 | 8 | 9 | 6,2 | 5 | 7,45 | M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 8 | 9,35 | <table border="1"> <thead> <tr> <th>d₁</th> <th>P</th> <th>l₁</th> <th>l₂</th> <th>d₂</th> <th>l</th> <th>□</th> <th>z</th> <th>∅</th> </tr> <tr> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th></th> <th>[mm]</th> </tr> </thead> <tbody> <tr><td>M 12</td><td>1,75</td><td>110</td><td>17</td><td>9</td><td>10</td><td>7</td><td>8</td><td>11,2</td></tr> <tr><td>M 14</td><td>2</td><td>110</td><td>20</td><td>11</td><td>12</td><td>9</td><td>8</td><td>13</td></tr> <tr><td>M 16</td><td>2</td><td>110</td><td>20</td><td>12</td><td>12</td><td>9</td><td>8</td><td>15</td></tr> </tbody> </table> | | | | | | | | | | d ₁ | P | l ₁ | l ₂ | d ₂ | l | □ | z | ∅ | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | M 12 | 1,75 | 110 | 17 | 9 | 10 | 7 | 8 | 11,2 | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 8 | 13 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 8 | 15 | | | | | | | | | | | | | | | | | | | | | |
| d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | ∅ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 3 | 0,5 | 56 | 8 | 18 | 3,5 | 6 | 2,7 | 4 | 2,83 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 4 | 0,7 | 63 | 11 | 21 | 4,5 | 6 | 3,4 | 4 | 3,73 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 5 | 0,8 | 70 | 12 | 25 | 6 | 8 | 4,9 | 5 | 4,68 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 5 | 5,6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 12 | 35 | 8 | 9 | 6,2 | 5 | 7,45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 8 | 9,35 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| d ₁ | P | l ₁ | l ₂ | d ₂ | l | □ | z | ∅ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 12 | 1,75 | 110 | 17 | 9 | 10 | 7 | 8 | 11,2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 8 | 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 8 | 15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Code | | | | | | | | | | Code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 485 710 | | | | | | | | | | 485 716 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 485 711 | | | | | | | | | | 485 717 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 485 712 | | | | | | | | | | 485 718 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 485 713 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 485 714 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 485 715 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



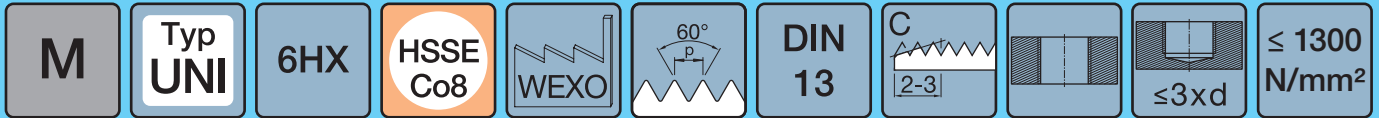
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| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 371 574 ⁴⁸⁰ TiCN | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 376 574 ⁴⁸⁰ TiCN | | | | | | | | | | | | | | | |
|--|--|-----------------------------------|--|--|-----------------------------------|-----------|-----------|---|-----------|---------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---|-----------|---------|
| Werkstoffgruppen Groupes de matières | | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 | Werkstoffgruppen Groupes de matières | | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 | | | | | | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | Ø [mm] | Code |
| M 3 | 0,5 | 56 | 8 | 18 | 3,5 | 6 | 2,7 | 4 | 2,85 | 485 730 | M 12 | 1,75 | 110 | 17 | 9 | 10 | 7 | 8 | 11,3 | 485 736 |
| M 4 | 0,7 | 63 | 11 | 21 | 4,5 | 6 | 3,4 | 4 | 3,75 | 485 731 | M 14 | 2 | 110 | 20 | 11 | 12 | 9 | 8 | 13,2 | 485 737 |
| M 5 | 0,8 | 70 | 12 | 25 | 6 | 8 | 4,9 | 5 | 4,7 | 485 732 | M 16 | 2 | 110 | 20 | 12 | 12 | 9 | 8 | 15,2 | 485 738 |
| M 6 | 1 | 80 | 10 | 30 | 6 | 8 | 4,9 | 5 | 5,65 | 485 733 | | | | | | | | | | |
| M 8 | 1,25 | 90 | 12 | 35 | 8 | 9 | 6,2 | 5 | 7,5 | 485 734 | | | | | | | | | | |
| M 10 | 1,5 | 100 | 15 | 39 | 10 | 11 | 8 | 8 | 9,4 | 485 735 | | | | | | | | | | |





| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | 957 504 ⁴⁸⁰ TiCN | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | 957 504 ⁴⁸⁰ TiCN |
|---|------|----------------|----------------|----------------|----------------|------|------|---|------|--|---|------|----------------|----------------|----------------|------|------|---|------|---------|--|
| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | | | | | | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 |
| d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | Ø | Code | d ₁ | P | l ₁ | l ₂ | d ₂ | l | □ | z | Ø | Code | |
| [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | | |
| M 2 | 0,4 | 80 | 8 | - | 2,8 | 5 | 2,1 | - | 1,85 | 485 840 | M 12 | 1,75 | 200 | 17 | 9 | 10 | 7 | 8 | 11,2 | 485 848 | |
| M 2,5 | 0,45 | 100 | 9 | - | 2,8 | 5 | 2,1 | - | 2,33 | 485 841 | | | | | | | | | | | |
| M 3 | 0,5 | 100 | 8 | 18 | 3,5 | 6 | 2,7 | 4 | 2,8 | 485 842 | | | | | | | | | | | |
| M 4 | 0,7 | 125 | 11 | 21 | 4,5 | 6 | 3,4 | 4 | 3,7 | 485 843 | | | | | | | | | | | |
| M 5 | 0,8 | 140 | 12 | 25 | 6 | 8 | 4,9 | 5 | 4,65 | 485 844 | | | | | | | | | | | |
| M 6 | 1 | 160 | 10 | 30 | 6 | 8 | 4,9 | 5 | 5,55 | 485 845 | | | | | | | | | | | |
| M 8 | 1,25 | 180 | 12 | 35 | 8 | 9 | 6,2 | 5 | 7,4 | 485 846 | | | | | | | | | | | |
| M 10 | 1,5 | 200 | 15 | 39 | 10 | 11 | 8 | 8 | 9,3 | 485 847 | | | | | | | | | | | |

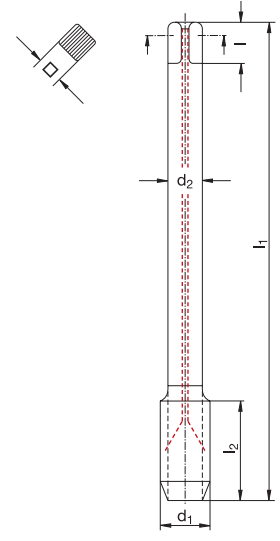
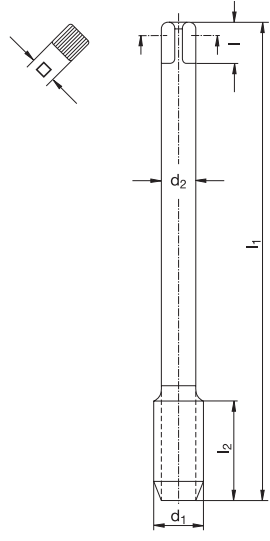
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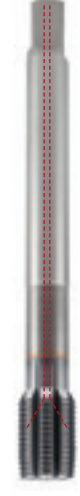
MF Typ UNI 6HX HSSE Co8 DIN 2174 60° DIN 13 C 2-3 ≤ 1300 N/mm²

MF

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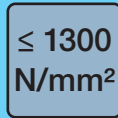
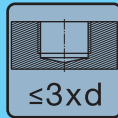
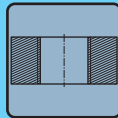
IKR



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|---|--|-------------------------------|---|--|-------------------------------|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 374 504 ⁴⁸⁰ | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 374 754 ⁴⁸⁰ |
| | | TiCN | | | TiCN |

| | | | | | |
|---|--|-----------------------------------|---|--|-----------------------------------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 |
|---|--|-----------------------------------|---|--|-----------------------------------|

| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code |
|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|-------|-----------|-------------|------------------------|-----------|------------------------|------------------------|------------------------|-----------|-----------|---------|-----------|------|
| M 8 x 1 | 90 | 10 | 8 | 9 | 6,2 | 5 | 7,55 | 485 635 | M 8 x 1 | 90 | 10 | 8 | 9 | 6,2 | 5 | 7,55 | 487 680 | | |
| M 10 x 1 | 90 | 12 | 10 | 11 | 8 | 8 | 9,55 | 485 636 | M 10 x 1 | 90 | 12 | 10 | 11 | 8 | 8 | 9,55 | 487 681 | | |
| M 10 x 1,25 | 100 | 12 | 10 | 11 | 8 | 8 | 9,45 | 485 637 | M 10 x 1,25 | 100 | 12 | 10 | 11 | 8 | 8 | 9,45 | 487 682 | | |
| M 12 x 1 | 100 | 15 | 9 | 10 | 7 | 8 | 11,55 | 485 638 | M 12 x 1,25 | 100 | 15 | 9 | 10 | 7 | 8 | 11,55 | 487 683 | | |
| M 12 x 1,25 | 100 | 15 | 9 | 10 | 7 | 8 | 11,45 | 485 639 | M 12 x 1,5 | 100 | 15 | 9 | 10 | 7 | 8 | 11,45 | 487 684 | | |
| M 12 x 1,5 | 100 | 15 | 9 | 10 | 7 | 8 | 11,3 | 485 640 | M 14 x 1,25 | 100 | 15 | 11 | 12 | 9 | 8 | 13,4 | 487 685 | | |
| M 14 x 1,25 | 100 | 15 | 11 | 12 | 9 | 8 | 13,4 | 485 641 | M 14 x 1,5 | 100 | 15 | 11 | 12 | 9 | 8 | 13,3 | 487 686 | | |
| M 14 x 1,5 | 100 | 15 | 11 | 12 | 9 | 8 | 13,3 | 485 642 | M 16 x 1,5 | 100 | 15 | 12 | 12 | 9 | 8 | 15,3 | 487 687 | | |
| M 16 x 1,5 | 100 | 15 | 12 | 12 | 9 | 8 | 15,3 | 485 643 | M 18 x 1,5 | 110 | 15 | 14 | 14 | 11 | 8 | 17,3 | 487 688 | | |
| M 18 x 1,5 | 110 | 15 | 14 | 14 | 11 | 8 | 17,3 | 485 644 | M 20 x 1,5 | 125 | 15 | 16 | 15 | 12 | 8 | 19,3 | 487 689 | | |
| M 20 x 1,5 | 125 | 15 | 16 | 15 | 12 | 8 | 19,3 | 485 645 | M 22 x 1,5 | 125 | 15 | 18 | 17 | 14,5 | 8 | 21,3 | 487 690 | | |
| M 22 x 1,5 | 125 | 15 | 18 | 17 | 14,5 | 8 | 21,3 | 485 646 | M 24 x 1,5 | 140 | 15 | 18 | 17 | 14,5 | 8 | 23,3 | 487 691 | | |
| M 24 x 1,5 | 140 | 15 | 18 | 17 | 14,5 | 8 | 23,3 | 485 647 | | | | | | | | | | | |



| MF | | | | | | | | | | G | | | | | | | | | | | | | | |
|---|-----------|------------------------|------------------------|------------------------|--|-----------|---|-----------|---------|--|-----------|------------------------|------------------------|------------------------|---|-----------|---|-----------|---------|--|--|--|--|--|
| MF 6HX 60° DIN 2174 DIN 13 D 3,5-5 | | | | | | | | | | G 55° DIN 2189 DIN ISO 228 C 2-3 | | | | | | | | | | | | | | |
| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | | | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | | | 374 604 ⁴⁸⁰ TiCN | | | | | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | | | | 980 504 ⁴⁸⁰ TiCN | | | | |
| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | |
| d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | d ₁ [mm] | P [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | l [mm] | □ [mm] | z | ∅ [mm] | Code | | | | | |
| M 8 x 1 | | 90 | 10 | 8 | 9 | 6,2 | 5 | 7,55 | 485 770 | G 1/8 | 28 | 90 | 9,73 | 9 | 7 | 5,5 | 8 | 9,3 | 485 700 | | | | | |
| M 10 x 1 | | 90 | 12 | 10 | 11 | 8 | 8 | 9,55 | 485 771 | G 1/4 | 19 | 100 | 13,16 | 13 | 11 | 9 | 8 | 12,5 | 485 701 | | | | | |
| M 10 x 1,25 | | 100 | 12 | 10 | 11 | 8 | 8 | 9,45 | 485 772 | G 3/8 | 19 | 100 | 16,66 | 13 | 12 | 9 | 8 | 16 | 485 702 | | | | | |
| M 12 x 1 | | 100 | 15 | 9 | 10 | 7 | 8 | 11,55 | 485 773 | G 1/2 | 14 | 125 | 20,96 | 18 | 16 | 12 | 8 | 20 | 485 703 | | | | | |
| M 12 x 1,25 | | 100 | 15 | 9 | 10 | 7 | 8 | 11,45 | 485 774 | | | | | | | | | | | | | | | |
| M 12 x 1,5 | | 100 | 15 | 9 | 10 | 7 | 8 | 11,3 | 485 775 | | | | | | | | | | | | | | | |
| M 14 x 1,5 | | 100 | 15 | 11 | 12 | 9 | 8 | 13,4 | 485 776 | | | | | | | | | | | | | | | |
| M 16 x 1,5 | | 100 | 15 | 12 | 12 | 9 | 8 | 15,3 | 485 777 | | | | | | | | | | | | | | | |
| M 18 x 1,5 | | 110 | 15 | 14 | 14 | 11 | 8 | 17,3 | 485 778 | | | | | | | | | | | | | | | |
| M 20 x 1,5 | | 125 | 15 | 16 | 15 | 12 | 8 | 19,3 | 485 779 | | | | | | | | | | | | | | | |

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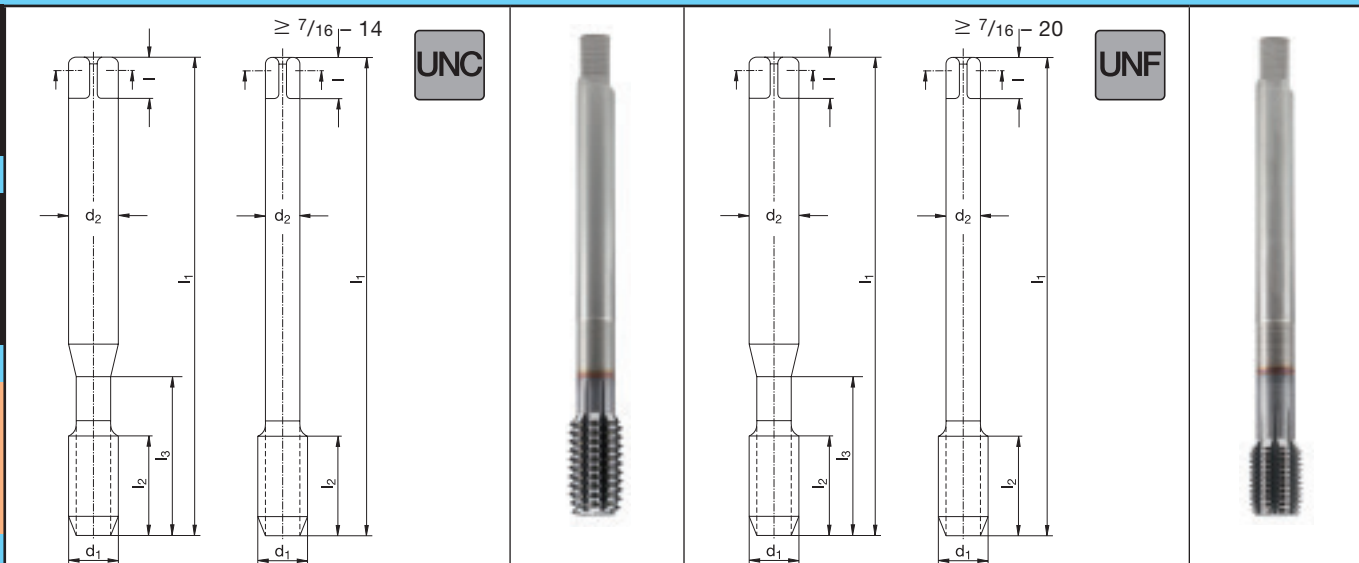




UNC

UNF

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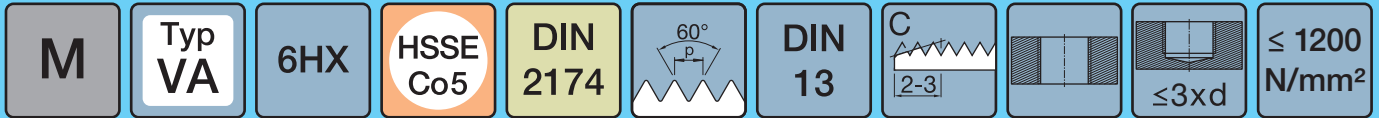


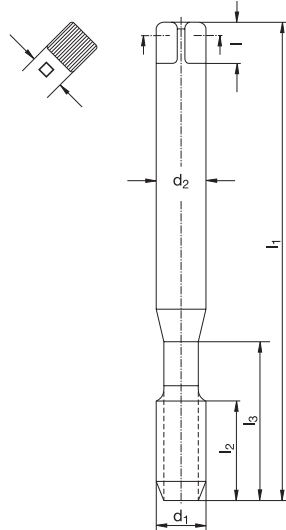

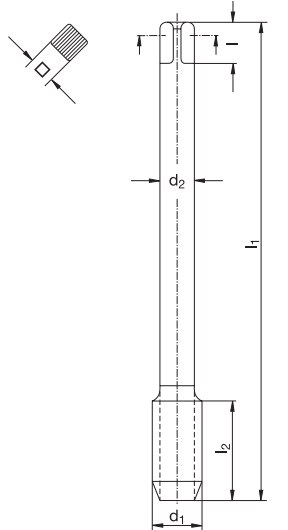

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|--|-------------------------------|--|-------------------------------|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | 920 504 ⁴⁸⁰ | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | 930 504 ⁴⁸⁰ |
| TICN | | TICN | |

| | | | |
|---|--|---|--|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali |
| | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 | | 1.1 – 1.5; 3.1; 3.3; 4.1 – 4.3 |

| P [Gg/1"] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | l ₃ [mm] | d ₂ [mm] | □ | z | ∅ | ∅ | Code |
|--------------|------------------------|------------------------|------------------------|------------------------|------------------------|------|---|------|---|---------|
| | | | | | | | | | | |
| # 5-40 | 3,18 | 56 | 6 | 18 | 3,5 | 2,7 | 4 | 2,9 | | 485 791 |
| # 6-32 | 3,51 | 56 | 8 | 20 | 4 | 3 | 4 | 3,15 | | 485 792 |
| # 8-32 | 4,17 | 63 | 8 | 21 | 4,5 | 3,4 | 4 | 3,8 | | 485 793 |
| # 10-24 | 4,83 | 70 | 11 | 25 | 6 | 4,9 | 5 | 4,3 | | 485 794 |
| 1/4-20 | 6,35 | 80 | 13 | 30 | 7 | 5,5 | 5 | 5,7 | | 485 795 |
| 5/16-18 | 7,94 | 90 | 14 | 35 | 8 | 6,2 | 5 | 7,25 | | 485 796 |
| 3/8-16 | 9,53 | 100 | 16 | 39 | 10 | 8 | 8 | 8,7 | | 485 797 |
| 7/16-14 | 11,11 | 100 | 18 | - | 8 | 6,2 | 8 | 10,2 | | 485 798 |
| 1/2-13 | 12,70 | 110 | 20 | - | 9 | 7 | 8 | 11,7 | | 485 799 |
| 9/16-12 | 14,29 | 110 | 21 | - | 11 | 9 | 8 | 13,2 | | 485 800 |
| 5/8-11 | 15,88 | 110 | 23 | - | 12 | 9 | 8 | 14,7 | | 485 801 |
| 3/4-10 | 19,05 | 125 | 20 | - | 14 | 11 | 8 | 17,7 | | 485 802 |
| 7/8-9 | 22,23 | 140 | 23 | - | 18 | 14,5 | 8 | 20,8 | | 485 803 |
| 1-8 | 25,40 | 160 | 26 | - | 18 | 14,5 | 8 | 23,8 | | 485 804 |



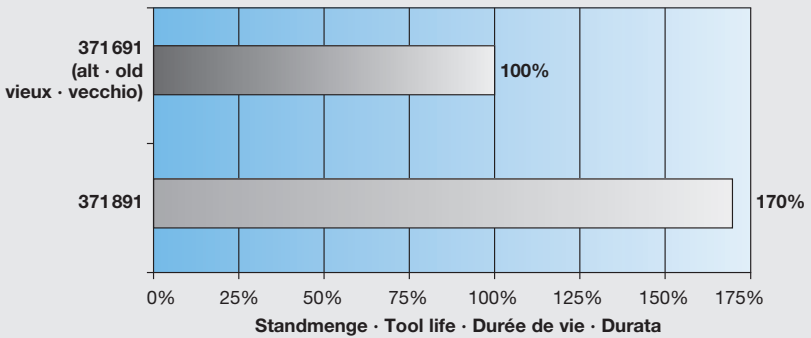


|  | |  | |  | |  | |
|--|--|--|--|--|---|---|--|
| Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 371 891 ⁴⁷⁰ TiN | Katalog-Nr. ^{W%} Catalogue n ^o W% | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 376 891 ⁴⁷⁰ TiN | | |
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1–1.3; 1.6; 3.1; 3.3; 3.4; 4.1–4.3; 7.1 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1–1.3; 1.6; 3.1; 3.3; 3.4; 4.1–4.3; 7.1 | | |
| d ₁ P l ₁ l ₂ l ₃ d ₂ l □ z SN Ø [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | Code | d ₁ P l ₁ l ₂ d ₂ l □ z SN Ø [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | Code | | | | |
| M 2 0,4 45 8 – 2,8 5 2,1 3 1 1,83 | 985 198 | M 12 1,75 110 28 9 10 7 6 3 11,2 | 985 240 | | | | |
| M 2,5 0,45 50 9 – 2,8 5 2,1 3 1 2,33 | 985 199 | M 14 2 110 30 11 12 9 5 5 13 | 985 241 | | | | |
| M 3 0,5 56 11 18 3,5 6 2,7 4 2 2,8 | 985 200 | M 16 2 110 32 12 12 9 7 7 15 | 985 242 | | | | |
| M 3,5 0,6 56 11 18 4 5 3,0 4 2 3,25 | 985 201 | | | | | | |
| M 4 0,7 63 13 21 4,5 6 3,4 5 5 3,7 | 985 202 | | | | | | |
| M 5 0,8 70 16 25 6 8 4,9 5 5 4,65 | 985 203 | | | | | | |
| M 6 1 80 19 30 6 8 4,9 5 5 5,55 | 985 204 | | | | | | |
| M 8 1,25 90 22 35 8 9 6,2 6 3 7,4 | 985 205 | | | | | | |
| M 10 1,5 100 24 39 10 11 8,0 6 3 9,3 | 985 206 | | | | | | |

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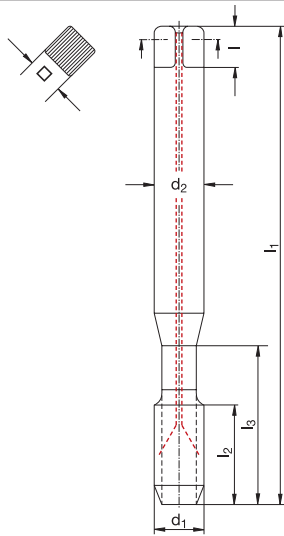
Einsatzbeispiele · Application examples · Exemple d'utilisation · Esempio di applicazione

| Werkzeugtyp · Tool type Type d'outil · Utensile | 371 891 | 371 691 (alt · old vieux · vecchio) |  <p>371 691 (alt · old) vieux · vecchio: 100%</p> <p>371 891: 170%</p> <p>Standmenge · Tool life · Durée de vie · Durata</p> |
|--|---|---|--|
| Werkstoff · Work material Pièce à usiner · Materiale | 1.0120 – St37 | | |
| Gewinde · Thread size Taraudage · Filettatura | M 8 - ISO2 (6H) | | |
| Gewindetiefe Thread depth Profondeur de taraudage Profondita' | 20 mm Sackloch · Blind hole Trou borgne · Cieco | | |
| V _c | 30 m/min | | |
| KSS Coolant lubricant Lubrification Lubrificante | 7% Emulsion · Emulsion · Emulsion · Emulsione | | |
| Standmenge · Tool life Durée de vie · Durata | 170% | 100% | |

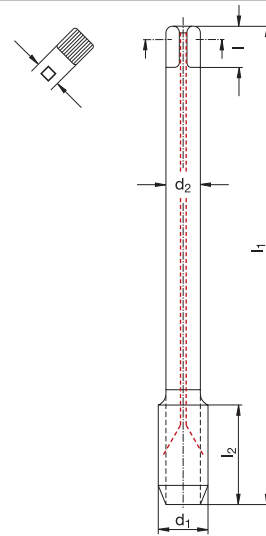
| | | | | | | | | | |
|---|--------|-----|----------|----------|----------|--------|----------|------|--------------------------|
| M | Typ VA | 6HX | HSSE Co5 | DIN 2174 | 60° P | DIN 13 | C 2-3 | ≤3xd | ≤ 1200 N/mm ² |
|---|--------|-----|----------|----------|----------|--------|----------|------|--------------------------|

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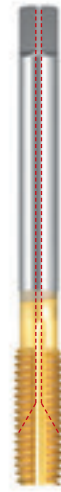
HSSE-Co5



IKR



IKR



Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}

Nr. di catalogo ^{W%}

371 791 ⁴⁷⁰
TiN

Katalog-Nr. ^{W%}
Catalogue n^o ^{W%}

Nr. di catalogo ^{W%}

376 791 ⁴⁷⁰
TiN

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1.1-1.3; 1.6; 3.1;
3.3; 3.4; 4.1-4.3;
7.1

Werkstoffgruppen
Groupes de matières

Classification of work materials
Gruppo materiali

1.1-1.3; 1.6; 3.1;
3.3; 3.4; 4.1-4.3;
7.1

| d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | SN | ∅ |
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| [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | [mm] |

Code

| d ₁ | P | l ₁ | l ₂ | d ₂ | l | □ | z | SN | ∅ |
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Code

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|------|------|-----|----|----|----|----|-----|---|---|------|
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 5 | 5 | 5,55 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 6 | 3 | 7,4 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 6 | 3 | 9,3 |

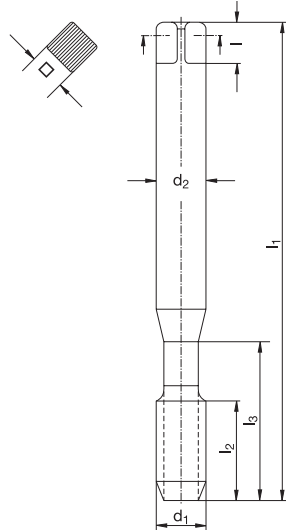

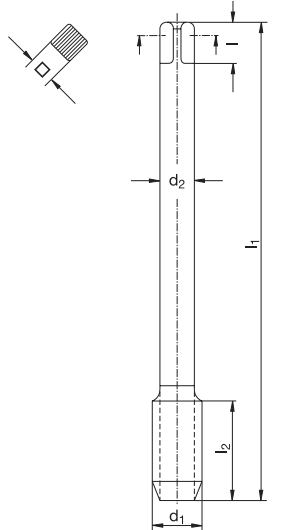

985 266
985 268
985 270

| | | | | | | | | | |
|------|------|-----|----|----|----|---|---|---|------|
| M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 6 | 3 | 11,2 |
| M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 5 | 5 | 13 |
| M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 7 | 7 | 15 |

985 271
985 272
985 273



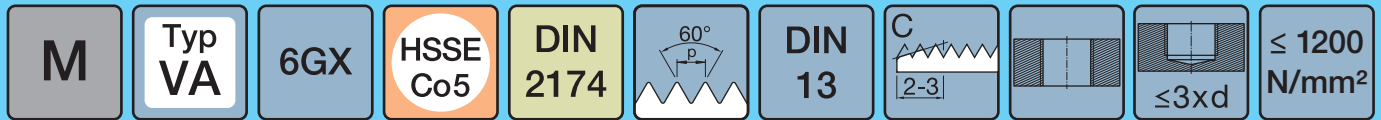
| | | | | | | | | | |
|---|-----------|-----|-------------|-------------|----------|-----------|----------|------|-----------------------------|
| M | Typ VA | 6GX | HSSE Co5 | DIN 2174 | 60° P | DIN 13 | C 2-3 | ≤3xd | ≤ 1200 N/mm ² |
|---|-----------|-----|-------------|-------------|----------|-----------|----------|------|-----------------------------|

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|--|------|-----|----|----|-----|----|-----|---|---|------|---|------|------|-----|----|----|----|---|---|---|------|--|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|
| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | | 371 892 ⁴⁷⁰ TiN | | | | | | | | | | | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | | 376 892 ⁴⁷⁰ TiN | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | | | | | | | | | | Classification of work materials Gruppo materiali | | | | | | | | | | | Werkstoffgruppen Groupes de matières | | | | | | | | | | | Classification of work materials Gruppo materiali | | | | | | | | | | |
| d₁ [mm] P [mm] l₁ [mm] l₂ [mm] l₃ [mm] d₂ [mm] l [mm] □ [mm] z SN Ø [mm] | | | | | | | | | | | Code | | | | | | | | | | | d₁ [mm] P [mm] l₁ [mm] l₂ [mm] d₂ [mm] l [mm] □ [mm] z SN Ø [mm] | | | | | | | | | | | Code | | | | | | | | | | |
| M 2 | 0,4 | 45 | 8 | - | 2,8 | 5 | 2,1 | 3 | 1 | 1,83 | 985 220 | M 12 | 1,75 | 110 | 28 | 9 | 10 | 7 | 6 | 3 | 11,2 | 985 237 | | | | | | | | | | | | | | | | | | | | | |
| M 2,5 | 0,45 | 50 | 9 | - | 2,8 | 5 | 2,1 | 3 | 1 | 2,33 | 985 225 | M 14 | 2 | 110 | 30 | 11 | 12 | 9 | 5 | 5 | 13 | 985 238 | | | | | | | | | | | | | | | | | | | | | |
| M 3 | 0,5 | 56 | 11 | 18 | 3,5 | 6 | 2,7 | 4 | 2 | 2,8 | 985 230 | M 16 | 2 | 110 | 32 | 12 | 12 | 9 | 7 | 7 | 15 | 985 239 | | | | | | | | | | | | | | | | | | | | | |
| M 3,5 | 0,6 | 56 | 11 | 18 | 4 | 5 | 3,0 | 4 | 2 | 3,25 | 985 231 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 4 | 0,7 | 63 | 13 | 21 | 4,5 | 6 | 3,4 | 5 | 5 | 3,7 | 985 232 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 5 | 5 | 4,65 | 985 233 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 5 | 5 | 5,55 | 985 234 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 6 | 3 | 7,4 | 985 235 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8,0 | 6 | 3 | 9,3 | 985 236 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

M

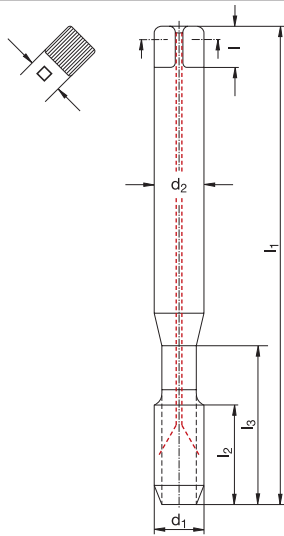
HSSE-Co5





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HSSE-
Co5

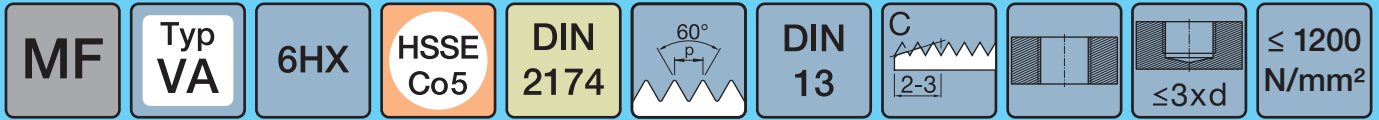


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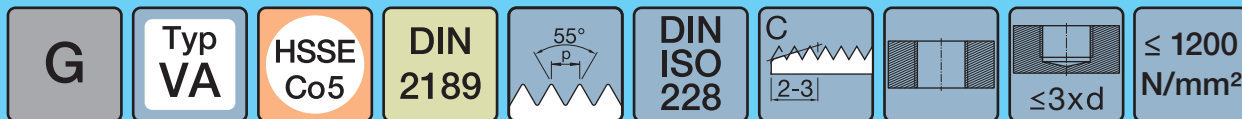


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|---|--|---|
| Katalog-Nr. ^{W%} | Catalogue no. ^{W%} | 371 792 ⁴⁷⁰ |
| Catalogue n° ^{W%} | Nr. di catalogo ^{W%} | TiN |
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.3; 1.6; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 |
| d₁ P l₁ l₂ l₃ d₂ l □ z SN ∅ | | Code |
| [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] [mm] | | |
| M 6 1 80 19 30 6 8 4,9 5 5 5,55 | | 985 260 |
| M 8 1,25 90 22 35 8 9 6,2 6 3 7,4 | | 985 261 |
| M 10 1,5 100 24 39 10 11 8 6 3 9,3 | | 985 262 |

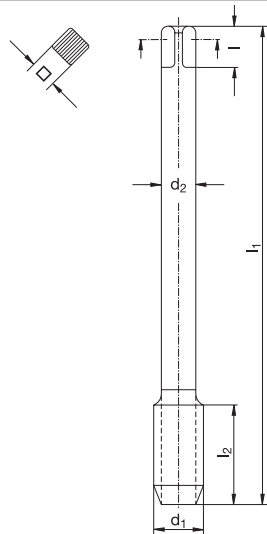




| | | | | MF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|------|--|----------------|----------------|----------------------|----------------|----------------|---|------|---------|------|---|------|------|------|------|------|------|------|------|------|--|--|------|--|------------|----|---|----|-----|---|-----|---|---|------|---------|-----------|----|----|----|-----|---|-----|---|---|-----|---------|-----------|----|----|----|---|---|-----|---|---|------|---------|------------|----|----|----|---|---|-----|---|---|-----|---------|---------|----|----|----|---|---|-----|---|---|------|---------|----------|----|----|----|----|----|---|---|---|------|---------|------------|-----|----|---|---|----|---|---|---|------|---------|------------|-----|----|---|----|----|---|---|---|------|---------|--|--|--|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 374 891 ⁴⁷⁰ | | | HSSE- Co5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Catalogue n° ^{W%} Nr. di catalogo ^{W%} | | TiN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 1.1–1.3; 1.6; 3.1; 3.3; 3.4; 4.1–4.3; 7.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>d₁</th> <th>P</th> <th>l₁</th> <th>l₂</th> <th>l₃</th> <th>d₂</th> <th>l</th> <th>□</th> <th>z</th> <th>SN</th> <th>Ø</th> <th>Code</th> </tr> <tr> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th>[mm]</th> <th></th> <th></th> <th>[mm]</th> <th></th> </tr> </thead> <tbody> <tr> <td>M 3 x 0,35</td> <td>56</td> <td>8</td> <td>18</td> <td>3,5</td> <td>6</td> <td>2,7</td> <td>3</td> <td>1</td> <td>2,85</td> <td>985 250</td> </tr> <tr> <td>M 4 x 0,5</td> <td>63</td> <td>10</td> <td>21</td> <td>4,5</td> <td>6</td> <td>3,4</td> <td>4</td> <td>2</td> <td>3,9</td> <td>985 251</td> </tr> <tr> <td>M 5 x 0,5</td> <td>70</td> <td>12</td> <td>25</td> <td>6</td> <td>8</td> <td>4,9</td> <td>4</td> <td>2</td> <td>4,78</td> <td>985 252</td> </tr> <tr> <td>M 6 x 0,75</td> <td>80</td> <td>14</td> <td>30</td> <td>6</td> <td>8</td> <td>4,9</td> <td>5</td> <td>5</td> <td>5,7</td> <td>985 253</td> </tr> <tr> <td>M 8 x 1</td> <td>90</td> <td>22</td> <td>35</td> <td>8</td> <td>9</td> <td>6,2</td> <td>5</td> <td>5</td> <td>7,55</td> <td>985 254</td> </tr> <tr> <td>M 10 x 1</td> <td>90</td> <td>20</td> <td>35</td> <td>10</td> <td>11</td> <td>8</td> <td>5</td> <td>5</td> <td>9,55</td> <td>985 255</td> </tr> <tr> <td>M 12 x 1,5</td> <td>100</td> <td>22</td> <td>-</td> <td>9</td> <td>10</td> <td>7</td> <td>6</td> <td>3</td> <td>11,3</td> <td>985 256</td> </tr> <tr> <td>M 16 x 1,5</td> <td>100</td> <td>22</td> <td>-</td> <td>12</td> <td>12</td> <td>9</td> <td>6</td> <td>3</td> <td>15,3</td> <td>985 257</td> </tr> </tbody> </table> | | d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | SN | Ø | Code | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | | [mm] | | M 3 x 0,35 | 56 | 8 | 18 | 3,5 | 6 | 2,7 | 3 | 1 | 2,85 | 985 250 | M 4 x 0,5 | 63 | 10 | 21 | 4,5 | 6 | 3,4 | 4 | 2 | 3,9 | 985 251 | M 5 x 0,5 | 70 | 12 | 25 | 6 | 8 | 4,9 | 4 | 2 | 4,78 | 985 252 | M 6 x 0,75 | 80 | 14 | 30 | 6 | 8 | 4,9 | 5 | 5 | 5,7 | 985 253 | M 8 x 1 | 90 | 22 | 35 | 8 | 9 | 6,2 | 5 | 5 | 7,55 | 985 254 | M 10 x 1 | 90 | 20 | 35 | 10 | 11 | 8 | 5 | 5 | 9,55 | 985 255 | M 12 x 1,5 | 100 | 22 | - | 9 | 10 | 7 | 6 | 3 | 11,3 | 985 256 | M 16 x 1,5 | 100 | 22 | - | 12 | 12 | 9 | 6 | 3 | 15,3 | 985 257 | | | |
| d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | SN | Ø | Code | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | | [mm] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 3 x 0,35 | 56 | 8 | 18 | 3,5 | 6 | 2,7 | 3 | 1 | 2,85 | 985 250 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 4 x 0,5 | 63 | 10 | 21 | 4,5 | 6 | 3,4 | 4 | 2 | 3,9 | 985 251 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 5 x 0,5 | 70 | 12 | 25 | 6 | 8 | 4,9 | 4 | 2 | 4,78 | 985 252 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 6 x 0,75 | 80 | 14 | 30 | 6 | 8 | 4,9 | 5 | 5 | 5,7 | 985 253 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 8 x 1 | 90 | 22 | 35 | 8 | 9 | 6,2 | 5 | 5 | 7,55 | 985 254 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 10 x 1 | 90 | 20 | 35 | 10 | 11 | 8 | 5 | 5 | 9,55 | 985 255 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 12 x 1,5 | 100 | 22 | - | 9 | 10 | 7 | 6 | 3 | 11,3 | 985 256 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M 16 x 1,5 | 100 | 22 | - | 12 | 12 | 9 | 6 | 3 | 15,3 | 985 257 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |



G



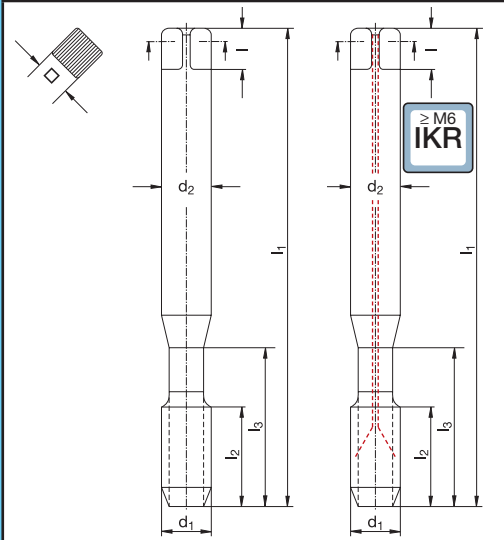
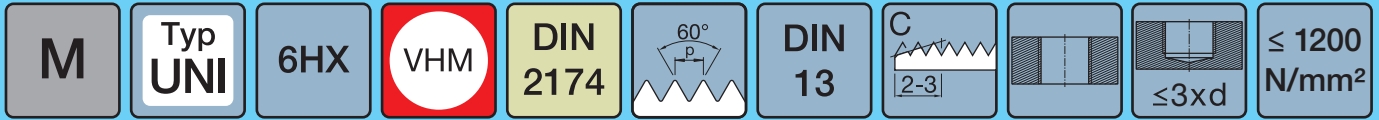
HSSE-
Co5

| | | |
|----------------------------|-------------------------------|------------------------|
| Katalog-Nr. ^{W%} | Catalogue no. ^{W%} | 980 891 ⁴⁷⁰ |
| Catalogue n° ^{W%} | Nr. di catalogo ^{W%} | TiN |

| | | |
|---|--|---|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.3; 1.6; 3.1; 3.3; 3.4; 4.1-4.3; 7.1 |
|---|--|---|

| P | d ₁ | l ₁ | l ₂ | d ₂ | l | □ | z | SN | ∅ | Code | |
|---------|----------------|----------------|----------------|----------------|------|------|-----|----|------|------|---------|
| [Gg/1"] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | | [mm] | | |
| G 1/8 | 28 | 9,73 | 90 | 20 | 7 | 8 | 5,5 | 5 | 5 | 9,25 | 985 300 |
| G 1/4 | 19 | 13,16 | 100 | 22 | 11 | 12 | 9 | 6 | 3 | 12,5 | 985 301 |
| G 3/8 | 19 | 16,66 | 100 | 22 | 12 | 12 | 9 | 6 | 3 | 16 | 985 302 |





M

VHM

Katalog-Nr. ^{W%} Catalogue no. ^{W%} **914 851** ⁴¹⁰
 Catalogue n° ^{W%} Nr. di catalogo ^{W%} **TiAIN**

Werkstoffgruppen Classification of work materials
 Groupes de matières Gruppo materiali 1.1-1.3; 1.6; 3.1;
 3.3; 3.4; 4.1-4.3;
 7.1

| d ₁ | P | l ₁ | l ₂ | l ₃ | d ₂ | l | □ | z | SN | ∅ | Code |
|----------------|------|----------------|----------------|----------------|----------------|------|------|---|----|------|---------|
| [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | | [mm] | |
| M 3 | 0,5 | 56 | 11 | 18 | 6 | 8 | 4,9 | 4 | 2 | 2,8 | 987 300 |
| M 4 | 0,7 | 63 | 13 | 21 | 6 | 8 | 4,9 | 5 | 5 | 3,7 | 987 301 |
| M 5 | 0,8 | 70 | 16 | 25 | 6 | 8 | 4,9 | 5 | 5 | 4,65 | 987 302 |

≥ M6 → IKR

| | | | | | | | | | | | |
|------|------|-----|----|----|----|----|-----|---|---|------|---------|
| M 6 | 1 | 80 | 19 | 30 | 6 | 8 | 4,9 | 5 | 5 | 5,55 | 987 303 |
| M 8 | 1,25 | 90 | 22 | 35 | 8 | 9 | 6,2 | 6 | 3 | 7,4 | 987 304 |
| M 10 | 1,5 | 100 | 24 | 39 | 10 | 11 | 8 | 6 | 3 | 9,3 | 987 305 |
| M 12 | 1,75 | 110 | 28 | 44 | 12 | 12 | 9 | 6 | 3 | 11,2 | 987 306 |



**Gewindefräser / Thread milling cutter /
Fraises à fileter / Frese a filettare**



Einsatzgebiete:

- universeller Einsatz
- bis ~ 54 HRC
- kurz- und langspanende Werkstoffe

Vorteile:

- Produktivitätssteigerung
- Senken und Gewinden in einem Arbeitsgang
- Bearbeitung von schwer zerspanbaren Materialien

Champs d'applications :

- Application universelle
- Jusqu'à ~ 54 HRC
- Matières à copeaux longs et courts

Avantages :

- Augmentation de la productivité
- Taraudage et chanfreinage en une fois
- Applications dans les matières difficiles

Applicationfield:

- universal application
- up to ~ 54 HRC
- short- and longchipping materials

Advantages:

- Productivity increasing
- Countersinking and thread milling in one step
- Application in difficult to cut materials

Campo di applicazione:

- Applicazioni universali
- Fino a ~ 54 HRC
- Materiali a truciolo corto e lungo

Vantaggi:

- Incremento della produttività
- Smusso e filettatura in una operazione
- Applicazioni in materiali difficili



Innenkühlung axial · Internal cooling axial ·

Lubrification axilale interne · Lubrificazione interna assiale

IKA

Universelle Beschichtung · Universal coating ·

Revêtement universel · Rivestimento universale

TiCN

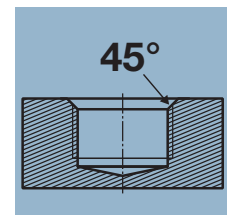
Gewinden bis · Threading up to ·

Taraudage jusqu'à · Filettature fino a

~ 54 HRC

Senken mit 914 445 · Countersink 914 445 ·

Chanfrein 914 445 · Svasatura 914 445



M

MF

G

VHM

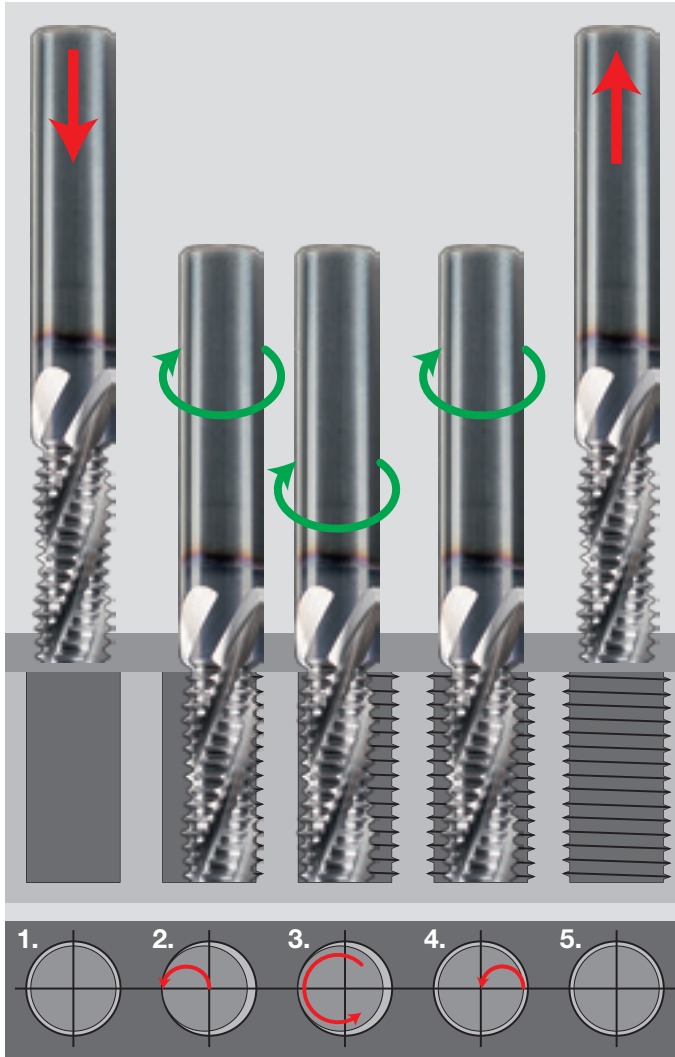


M

MF

G

VHM



Ablauf:

1. Einfahren in die Bohrung bis kurz vor den Bohrungsgrund
2. Anfahren im Viertel- oder Halbkreis an die Kontur
3. Ausführen der Schraubenlinieninterpolation
4. Ausfahren im Viertel- oder Halbkreis zur Bohrungsmitte
5. Ausfahren aus der Bohrung

Procedure:

1. Insertion into drill hole up to shortly before the bottom
2. Contour approach in a quarter or semicircle
3. Carrying out of helical interpolation
4. Backing out in a quarter or semicircle with regard to the drill hole centre
5. Backing out of drill hole

Procédure :

1. Descendre quasiment jusqu'au fond du perçage
2. Approches en quart ou en demi-cercle
3. Interpolation hélicoïdale
4. Sortir du filet en quart ou en demi-cercle
5. Sortie du taraudage au centre de l'avant-trou

Procedure:

1. Introduzione quasi fino in fondo al foro
2. Avvicinamento al contorno con un movimento a quarto di cerchio o a semicerchio
3. Interpolazione elicoidale
4. Rientro al centro con un movimento a quarto di cerchio o a semicerchio
5. Uscita dal foro

Bemerkung:

Beim Gewindefräsen in Grundlochbohrungen empfiehlt es sich, die Bearbeitung im Bohrungsgrund zu beginnen, damit das Werkzeug nicht auf den Spänen aufsetzt. Nach Möglichkeit soll im Gleichlauf gefräst werden, um eine optimale Oberflächenqualität der Gewindeflanken zu erzielen.

Um die Lehrenhaltigkeit der Gewinde reproduzierbar herzustellen, wird empfohlen, die Bearbeitung in zwei Umläufen durchzuführen. (Umlauf 1: Schruppen ca. 80–85%; Umlauf 2: Schlichten auf Fertigmaß).

Remark:

When milling a thread into a blind hole, machining should be started at the bottom of the hole so that the tool will not hit the chips. To achieve an optimal surface quality of the thread flanks, milling should preferably be carried out in climb milling.

We recommend carrying out the machining in two steps so that threads with reproducible accuracy to gauge can be manufactured. (Step 1: roughing, approx. 80-85%; step 2: finishing to final dimensions).

Remarques :

Filetages des trous borgnes : il est conseillé de commencer l'opération au fond du perçage afin d'éviter le recyclage ou le bourrage des copeaux.

Pour obtenir une qualité optimale de surface des flancs de filets, il est conseillé de travailler en avalant.

Pour obtenir des filetages de dimensions exactes et reproductibles, il est conseillé de travailler en 2 passes.

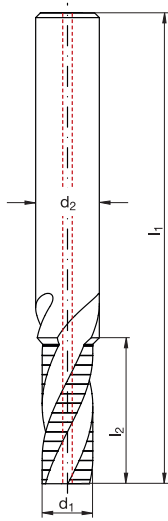
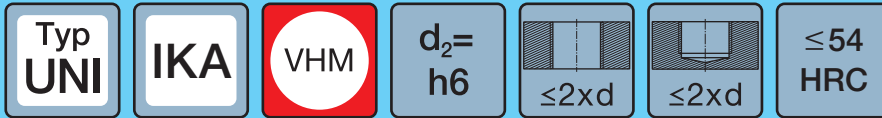
(Passe 1 = ébauche env. 80-85% de l'Ae, passe 2 finition à la tolérance voulue).

Osservazioni:

Quando si fresa un filetto in un foro cieco, la lavorazione dovrebbe partire dal basso per evitare problemi con il truciolo. Per ottenere una qualità superficiale ottimale delle filettature, la fresatura deve essere preferibilmente effettuata in concordanza.

Si consiglia di effettuare la lavorazione in due fasi in modo che la qualità della tolleranza e la ripetibilità di processo siano costanti. (Fase 1: sgrossatura, circa 80-85%; fase 2: Finiture).





M

MF

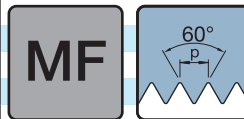
G

VHM

Katalog-Nr. ^{W%} Catalogue no. ^{W%} **914 440⁴¹⁵**
Catalogue n° ^{W%} Nr. di catalogo ^{W%} **TiCN**

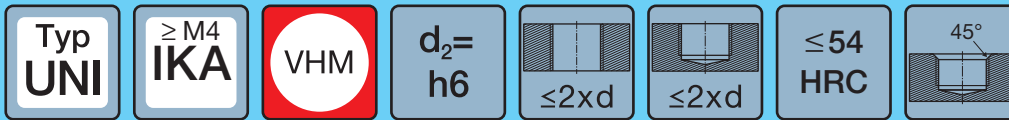
Werkstoffgruppen Classification of work materials
Groupes de matières Gruppo materiali
1; 2; 3; 4.3; 4.4;
7; 8.2.1

| | P [mm] | d ₁ [mm] | l ₁ [mm] | l ₂ [mm] | d ₂ [mm] | z | ∅ [mm] | Code |
|--------------------|-----------|------------------------|------------------------|------------------------|------------------------|-------|-----------|---------|
| M 6 | 1 | 4,80 | 54 | 13,5 | 6 | 3 | 5 | 140 406 |
| M 8 | 1,25 | 6,40 | 62 | 18,1 | 8 | 3 | 6,8 | 140 409 |
| M 10 | 1,5 | 7,95 | 74 | 21,8 | 10 | 3 | 8,5 | 140 412 |
| M 12 | 1,75 | 9,95 | 74 | 25,4 | 10 | 4 | 10,2 | 140 415 |
| M 14 | 2 | 11,20 | 90 | 31,0 | 12 | 4 | 12 | 140 418 |
| M 16 | 2 | 12,80 | 90 | 35,0 | 14 | 4 | 14 | 140 420 |
| M 20 | 2,5 | 14,95 | 102 | 41,3 | 16 | 4 | 17,5 | 140 424 |
| M 8 x 1 | 6,40 | 62 | 17,5 | 8 | 3 | 7 | 140 411 | |
| M 10 x 1 | 7,95 | 74 | 21,5 | 10 | 3 | 9 | 140 413 | |
| M 10 x 1,25 | 7,95 | 74 | 21,9 | 10 | 3 | 8,8 | 140 414 | |
| M 14 x 1,5 | 11,20 | 90 | 30,8 | 12 | 4 | 12,5 | 140 419 | |
| M 16 x 1,5 | 12,80 | 90 | 33,8 | 14 | 4 | 14,5 | 140 421 | |
| M 20 x 1,5 | 14,95 | 102 | 42,8 | 16 | 4 | 18,5 | 140 425 | |
| G 1/8 28 | 7,95 | 64 | 21,3 | 8 | 3 | 8,8 | 140 598 | |
| G 1/4 19 | 10,50 | 90 | 28,7 | 12 | 4 | 11,8 | 140 599 | |
| G 3/8 19 | 13,60 | 90 | 35,4 | 14 | 4 | 15,25 | 140 607 | |

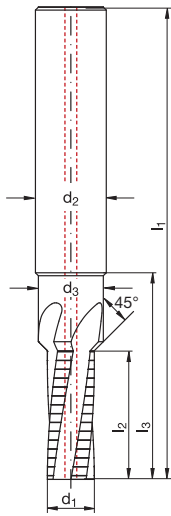


Weitere Abmessungen und Ausführungen auf Anfrage lieferbar.
Further dimensions and designs available on request.
Autres dimensions et exécutions particulières sur demande.
Altre misure e tipologie sono disponibili a richiesta.

| MAT | 1.1-1.3 / < 800 N/mm ² Unlegierte und niedrig- legierte Stähle · Unalloyed and low-alloyed steels · Aciers non alliés et faiblement alliés · Acciai non legati e basso-legati | 1.4; 1.5 / < 1300 N/mm ² Legierte und vergütete Stähle · Alloyed and pre hardened steels · Aciers alliés et pré-traités · Materiali legati e pre-tempra | 1.6 Rost-, säure- und hitzebeständige Stähle · Stainless, acid- and heatproof steels · Acier inoxydables et résistant à la corrosion · Acciai inossidabili e resistenti agli acidi | 2 Gusseisen · Cast iron · Fonte · Ghisa | 3; 4 Kupfer; Aluminium · Copper; Aluminium · Cuivre; Aluminium · Rame; Alluminio | 7 Kunststoffe · Plastics · Plastiques · Plastici | 8.2.1 45-54 HRC |
|----------------|--|--|--|---|--|--|--------------------|
| V _c | 80 ~ 160 m/min | 60 ~ 100 m/min | 60 ~ 80 m/min | 80 ~ 140 m/min | 200 ~ 400 m/min | 250 ~ 300 m/min | 40 ~ 60 m/min |
| f _z | 0,03 ~ 0,06 | 0,01 ~ 0,05 | 0,03 ~ 0,06 | 0,03 ~ 0,06 | 0,05 ~ 0,15 | 0,05 ~ 0,15 | 0,02 ~ 0,03 |
| f | 0,19 | 0,15 | 0,16 | 0,24 | 0,27 | 0,25 | 0,07 |



M



- mit Senkfase
- with countersink
- avec chanfrein
- con smusso

MF

G

VHM

Katalog-Nr. ^{W%} **Catalogue no. ^{W%}**
Catalogue n° ^{W%} **Nr. di catalogo ^{W%}** **914 445⁴¹⁵**
TiCN

Werkstoffgruppen **Classification of work materials**
 Groupes de matières **Gruppo materiali** 1; 2; 3; 4.3; 4.4;
 7; 8.2.1

| | P | d ₁ | d ₃ | l ₁ | l ₂ | l ₃ | d ₂ | z | Ø | Code |
|------|------|----------------|----------------|----------------|----------------|----------------|----------------|---|------|---------|
| | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | [mm] | |
| M 3 | 0,5 | 2,30 | - | 48 | 6,8 | 12 | 6 | 3 | 2,5 | 140 451 |
| M 4 | 0,7 | 3,00 | - | 48 | 8,8 | 12 | 6 | 3 | 3,3 | 140 452 |
| M 5 | 0,8 | 3,80 | - | 54 | 10,8 | 18 | 6 | 3 | 4,2 | 140 454 |
| M 6 | 1 | 4,50 | - | 62 | 13,5 | 26 | 8 | 3 | 5 | 140 456 |
| M 8 | 1,25 | 5,95 | - | 74 | 18,1 | 34 | 10 | 3 | 6,8 | 140 459 |
| M 10 | 1,5 | 7,95 | - | 80 | 21,8 | 35 | 12 | 4 | 8,5 | 140 462 |
| M 12 | 1,75 | 9,95 | - | 90 | 25,4 | 45 | 14 | 4 | 10,2 | 140 465 |
| M 14 | 2 | 11,20 | - | 102 | 31,0 | 54 | 16 | 4 | 12 | 140 468 |
| M 16 | 2 | 12,80 | - | 102 | 35,0 | 54 | 18 | 4 | 14 | 140 470 |
| M 20 | 2,5 | 13,95 | - | 125 | 41,3 | 75 | 20 | 4 | 17,5 | 140 474 |



| | | | | | | | | | |
|-------------|-------|---|-----|------|----|----|---|------|---------|
| M 4 x 0,5 | 3,00 | - | 48 | 8,8 | 12 | 6 | 3 | 3,5 | 140 453 |
| M 5 x 0,5 | 3,80 | - | 54 | 10,8 | 18 | 6 | 3 | 4,5 | 140 455 |
| M 6 x 0,5 | 4,50 | - | 62 | 12,8 | 26 | 8 | 3 | 5,5 | 140 457 |
| M 6 x 0,75 | 4,50 | - | 62 | 13,1 | 26 | 8 | 3 | 5,25 | 140 458 |
| M 8 x 0,75 | 5,95 | - | 74 | 16,9 | 34 | 10 | 3 | 7,25 | 140 460 |
| M 8 x 1 | 5,95 | - | 74 | 17,5 | 34 | 10 | 3 | 7 | 140 461 |
| M 10 x 1 | 7,95 | - | 80 | 21,5 | 35 | 12 | 4 | 9 | 140 463 |
| M 10 x 1,25 | 7,95 | - | 80 | 21,9 | 35 | 12 | 4 | 8,8 | 140 464 |
| M 12 x 1 | 9,95 | - | 90 | 25,5 | 45 | 14 | 4 | 11 | 140 466 |
| M 12 x 1,5 | 9,95 | - | 90 | 26,3 | 45 | 14 | 4 | 10,5 | 140 467 |
| M 14 x 1,5 | 11,20 | - | 102 | 30,8 | 54 | 16 | 4 | 12,5 | 140 469 |
| M 16 x 1,5 | 12,80 | - | 102 | 33,8 | 54 | 18 | 4 | 14,5 | 140 471 |



| | | | | | | | | |
|----------|-------|----|----|------|----|---|------|---------|
| G 1/8 28 | 7,95 | 28 | 64 | 21,3 | 12 | 4 | 8,8 | 140 475 |
| G 1/4 19 | 9,95 | 19 | 90 | 28,7 | 14 | 4 | 11,8 | 140 476 |
| G 3/8 19 | 13,60 | 19 | 90 | 35,4 | 18 | 4 | 11,8 | 140 477 |



Weitere Abmessungen und Ausführungen auf Anfrage lieferbar.

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Autres dimensions et exécutions particulières sur demande.

Altre misure e tipologie sono disponibili a richiesta.

**Zirkular-Bohrgewindefräser / Circular
Drill Thread Mill / Fraise à percer Fileter
hélicoïdal / Fresa a filettare elicoidale**



M

MF

G

VHM

Einsatzgebiete:

- Gewindefräsen ohne Vorbohren
- bis 65 HRC
- vorwiegend kurzspanende Werkstoffe

Vorteile:

- Senken und Gewindefräsen in einem Arbeitsgang
- Bearbeitung von schwer zerspanbaren Materialien
- hohe Prozesssicherheit

Champs d'applications :

- Fraise à fileter sans pré-trou
- Jusqu'à 65 HRC
- principalement pour les matériaux à copeaux courts

Avantages :

- Chanfreinage et fraisage des filets en une seule étape
- Usinage de matériaux difficiles à couper
- grande stabilité du processus

Applicationfield:

- Thread milling without pre-hole
- up to 65 HRC
- primarily for short chipping materials

Advantages:

- Countersinking and thread milling in one step
- Machining difficult to cut materials
- high process-stability

Campo di applicazione:

- fresatura di filetti senza pre-foro
- Fino a 65 HRC
- principalmente per materiali a truciolo corto

Vantaggi:

- Svasatura e filettatura in un solo passaggio
- lavorazione di materiali difficili
- elevata stabilità di processo



45° Ansenkfase · 45° Chamfer part ·

45° Chamfrein d'entrée · 45° inclinazione d' attacco

Innenkühlung axial · Internal cooling axial ·

Lubrification axilale interne · Lubrificazione interna assiale

Gewindefräsen bis · Thread milling up to ·

Taraudage jusqu'à · Filettature fino a

Spezial-Beschichtung · Special Coating ·

Revêtement spécial · Rivestimento speciale

Linksschneidend (Spindel-Drehrichtung links) ·

Lefthand cut (rotating direction left) ·

Coupe à gauche (rotation à gauche) ·

Taglio sinistro (direzione di rotazione sinistra)

Vorschubrichtung Rechts · Feed direction right ·

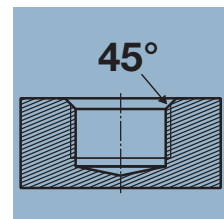
Sens de l'avance à droite ·

Direzione di avanzamento destro

Ultra-Feinstkorn-VHM · Ultra-Micrograin-SC ·

Carbure ultra micro grains ·

Metallo duro Ultra-Micrograna



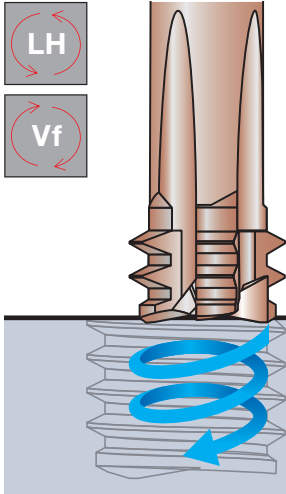
IKZ

~ 65 HRC

AlTiN-TiSiN

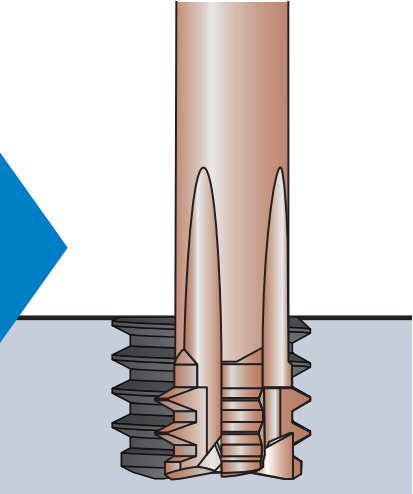


**Keine Kernlochbohrung notwendig! · No pre-drilled hole is required! ·
Aucun trou pré-perçage n'est nécessaire ! · Il pre-foro non è necessario!**



**Helikales Bohren + Gewindefräsen ·
Helical drilling + Threading ·
Perçage + Filetage hélicoïdal ·
Foratura + Filettatura elicoidale**

**Drei Bearbeitungen:
Bohren, Gewinden, Fasen ·
Three operations:
Drilling, threading, chamfering ·
Trois Opérations :
Perçage, filetage, chanfreinage ·
Tre operazioni:
Foratura, filettatura, smusso**



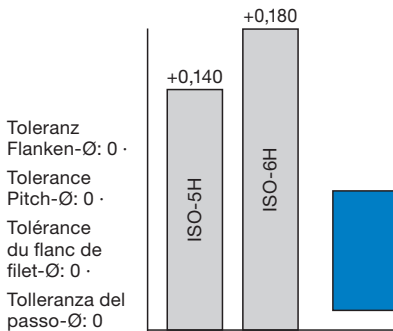
M

MF

G

VHM

**Der RPRG-Wert ist der Referenzwert für die Radiuskorrektur des Werkzeugs ·
The RPRG is the reference value of tool radius offset ·
Le RPRG est la valeur de référence du rayon de l'outil ·
L'RPRG è il valore di riferimento del raggio dell'utensile**



Beispiel · Example · Exemple · Esempio:

Code: 140 565
Ø 7,5
P 1,5
M 10 x 1,5
ISO-5H 0 - +140
ISO-6H 0 - +180

Eingegebener RPRG: 3,690 mm (Werkzeugdurchmesser 7,5 mm) ·
Entered value of RPRG: 3,690 mm (Tool diameter 7,5 mm) ·

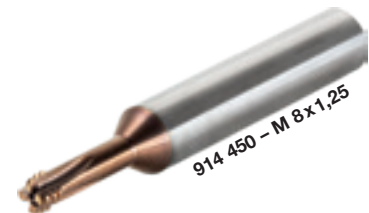
Valeur saisie de RPRG : 3,690 mm (diamètre de l'outil 7,5 mm) ·
Valore inserito di RPRG : 3,690 mm (diametro utensile 7,5 mm)

Radius · Radius · Rayon · Raggio

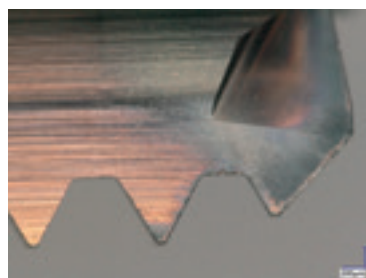


Einsatzbeispiel · Example of application · Exemple d'application · Esempio di applicazione:

| | |
|--|-------------------------------|
| Werkzeug · Tool · Outils · Utensile | 914 450 (140 564) |
| Werkstoff · Work material · Matière · Materiale | 1.2379 (60 HRC) |
| Abmessung · Size · Diamètre · Misura | M 8 x 1,25 |
| Tiefe · Depth · Profondeur de taraudage · Profondità | 16 mm (2 x D) |
| KSS · Coolant · Lubrifiant · Lubrificante | Luft · Air · Air · Aria (IKZ) |
| V _c | 40 m/min |
| f _z | 0,02 mm/t |



**Kaum Verschleiß nach 20 Gewinden ·
Only small wear after 20 threads ·
Seulement une petite usure après 20 filets ·
Solo una piccola usura dopo 20 filetti**



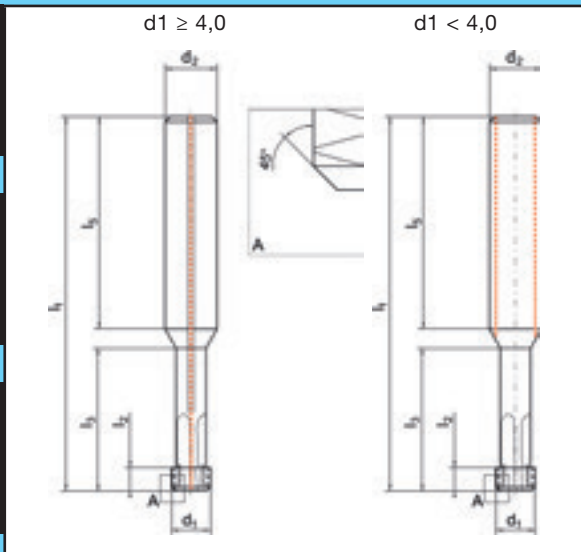


M

MF

G

VHM



LH
Linksschneidend (Spindel-Drehrichtung links) ·
Lefthand cut (rotating direction left) ·
Coupe à gauche (rotation à gauche) ·
Taglio sinistro (direzione di rotazione sinistra)

Vf
Vorschubrichtung Rechts ·
Feed direction right ·
Sens de l'avance à droite ·
Direzione di avanzamento destro

Katalog-Nr. ^{W%} **914 450**⁴¹⁵
Catalogue no. ^{W%}
Catalogue n° ^{W%} **914 450**⁴¹⁵
Nr. di catalogo ^{W%}

Werkstoffgruppen ^{W%} **AlTiN-TiSiN**
Groupes de matières
Classification of work materials
Gruppo materiali

| | P | d ₁ | l ₁ | l ₂ | l ₃ | l ₅ | d ₂ | z | RPRG | Code |
|------------------|-------|----------------|----------------|----------------|----------------|----------------|----------------|------|---------|---------|
| | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | [mm] | | | |
| M 3 | 0,5 | 2,40 | 57 | 1,8 | 8,2 | 44,0 | 6 | 4 | 1,20 | 140 560 |
| M 4 | 0,7 | 3,10 | 57 | 2,2 | 11,2 | 41,5 | 6 | 4 | 1,53 | 140 561 |
| M 5 | 0,8 | 4,00 | 57 | 2,56 | 13,7 | 39,8 | 6 | 4 | 1,98 | 140 562 |
| M 6 | 1 | 4,60 | 57 | 3,36 | 17,6 | 36,4 | 6 | 4 | 2,27 | 140 563 |
| M 7 | 1 | 4,60 | 57 | 3,36 | 17,6 | 36,4 | 6 | 4 | 2,27 | 140 563 |
| M 8 | 1,25 | 6,20 | 72 | 3,5 | 22,0 | 45,1 | 10 | 4 | 3,04 | 140 564 |
| M10 | 1,5 | 7,50 | 72 | 4,5 | 27,5 | 40,5 | 10 | 4 | 3,69 | 140 565 |
| M12 | 1,75 | 9,00 | 72 | 4,8 | 32,8 | 36,2 | 10 | 4 | 4,44 | 140 566 |
| M14 | 2 | 9,00 | 83 | 6,3 | 38,2 | 39,9 | 12 | 4 | 4,43 | 140 567 |
| M16 | 2 | 11,70 | 83 | 6,3 | 43,2 | 37,3 | 12 | 4 | 5,71 | 140 568 |
| M 4 x0,5 | 2,40 | 57 | 1,8 | 8,2 | 44,0 | 6 | 4 | 1,16 | 140 560 | |
| M 8 x1 | 4,60 | 57 | 3,36 | 17,6 | 36,4 | 6 | 4 | 2,23 | 140 563 | |
| M10 x1,25 | 6,20 | 72 | 3,5 | 22,0 | 45,1 | 10 | 4 | 3,01 | 140 564 | |
| M12 x1,5 | 7,50 | 72 | 4,5 | 27,5 | 40,5 | 10 | 4 | 3,65 | 140 565 | |
| G 1/16 28 | 5,80 | 57 | 3,2 | 18,0 | 37,8 | 6 | 4 | 2,90 | 140 570 | |
| G 1/8 28 | 7,30 | 72 | 3,2 | 22,0 | 47,6 | 10 | 4 | 3,65 | 140 571 | |
| G 1/4 19 | 9,80 | 72 | 4,5 | 30,0 | 40,5 | 10 | 4 | 4,90 | 140 572 | |
| G 3/8 19 | 11,80 | 83 | 4,5 | 37,0 | 44,5 | 12 | 4 | 5,90 | 140 573 | |
| G 1/2 14 | 15,70 | 100 | 6 | 47,0 | 51,2 | 16 | 4 | 7,85 | 140 574 | |
| G 3/4* 14 | 15,70 | 100 | 6 | 47,0 | 51,2 | 16 | 4 | 7,85 | 140 574 | |

Der RPRG-Wert ist der Referenzwert für die Radiuskorrektur des Werkzeugs ·
The RPRG is the reference value of tool radius offset ·
Le RPRG est la valeur de référence du rayon de l'outil ·
L'RPRG è il valore di riferimento del raggio dell'utensile

M

MF

G



















* = ≤ 1,8xd









| MAT | 1.4; 1.5 < 1300 N/mm ² | 1.6 | 5 | 8.2.1 45-55 HRC | 8.2.2 55-60 HRC | 8.2.3 60-65 HRC |
|---|---|---|---|---|---|---|
| V _c | 60 ~ 120 m/min | 40 ~ 80 m/min | 35 ~ 55 m/min | 30 ~ 60 m/min | 30 ~ 50 m/min | 30 ~ 40 m/min |
| Kühlmittel Coolant Lubrifiant Lubrificante | Emulsion Emulsion Emulsion Emulsione | Emulsion Emulsion Emulsion Emulsione | Emulsion Emulsion Emulsion Emulsione | Pressluft Compressed air Air comprimé Aria compressa | Pressluft Compressed air Air comprimé Aria compressa | Pressluft Compressed air Air comprimé Aria compressa |
| Ø | f _z | f _z | f _z | f _z | f _z | f _z |
| 3 | 0,01 ~ 0,02 | 0,01 ~ 0,02 | 0,01 ~ 0,02 | 0,01 ~ 0,02 | 0,01 ~ 0,02 | 0,01 ~ 0,02 |
| 6 | 0,01 ~ 0,05 | 0,01 ~ 0,05 | 0,01 ~ 0,05 | 0,01 ~ 0,05 | 0,01 ~ 0,05 | 0,01 ~ 0,05 |
| 8 | 0,01 ~ 0,07 | 0,01 ~ 0,07 | 0,01 ~ 0,07 | 0,01 ~ 0,07 | 0,01 ~ 0,07 | 0,01 ~ 0,07 |
| 10 | 0,01 ~ 0,07 | 0,01 ~ 0,07 | 0,01 ~ 0,07 | 0,01 ~ 0,07 | 0,01 ~ 0,07 | 0,01 ~ 0,07 |
| 13 | 0,01 ~ 0,07 | 0,01 ~ 0,07 | 0,01 ~ 0,07 | 0,01 ~ 0,07 | 0,01 ~ 0,07 | 0,01 ~ 0,07 |

Spiralbohrer / Twist drills / Forets / Punte



| | | | | | | |
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| 024 012 | 268-269 | 284 | 527 100 | 228-229 | 272-273 | 529 700 | 255-256 | 278 |
| 025 020 | 270 | 286-287 | 528 010 | 248-249 | 276 | | | |



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|---------|--|------------|------|------------------------|------------------------|-----------------------------|-------|--------------------|-----|
| 527 000 | | Typ UNI | ≤3xd | d ₁ = h8 | d ₂ = h7 | ≤ 1200 N/mm ² | TiAIN | Ø 1,0 – 20,0 mm | 226 |
| 527 100 | | Typ UNI | ≤5xd | d ₁ = h8 | d ₂ = h7 | ≤ 1200 N/mm ² | TiAIN | Ø 2,0 – 20,0 mm | 228 |



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|---------|--|------------|------|------------------------|------------------------|-----------------------------|-----|--------------------|-----|
| 529 000 | | Typ UNI | ≤3xd | d ₁ = h8 | d ₂ = h7 | ≤ 1200 N/mm ² | TiN | Ø 0,5 – 20,0 mm | 230 |
| 529 100 | | Typ UNI | ≤5xd | d ₁ = h8 | d ₂ = h7 | ≤ 1200 N/mm ² | TiN | Ø 2,0 – 20,0 mm | 239 |



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| | | | | | | | | | |
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| 528 010 | | Typ N | ≤10xd | d ₁ = h8 | d ₂ = h7 | ≤ 900 N/mm ² | TiAIN | Ø 1,6 – 12,0 mm | 248 |
| 528 015 | | Typ N | ≤15xd | d ₁ = h8 | d ₂ = h7 | ≤ 900 N/mm ² | TiAIN | Ø 1,6 – 12,0 mm | 250 |
| 528 020 | | Typ N | ≤20xd | d ₁ = h8 | d ₂ = h7 | ≤ 900 N/mm ² | TiAIN | Ø 1,6 – 12,0 mm | 251 |



PS 105

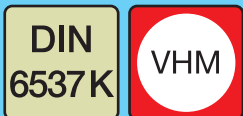
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|---------|--|-------------|------|------------------------|------------------------|------------|------|--------------------|-----|
| 529 500 | | Typ SH53 | ≤3xd | d ₁ = h8 | d ₂ = h7 | ~53 HRC | TiCN | Ø 2,0 – 17,7 mm | 253 |
| 529 700 | | | ≤5xd | d ₁ = h8 | d ₂ = h7 | ~35 HRC | TiCN | Ø 2,0 – 32,0 mm | 255 |



VHM

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|---------|--|------------|------|------------------------|------------------------|------------|---------------|--------------------|-----|
| 026 005 | | Typ UNI | ≤5xd | d ₁ = h6 | d ₂ = h6 | ~50 HRC | FUTURA TOP | Ø 0,1 – 1,95 mm | 257 |
|---------|--|------------|------|------------------------|------------------------|------------|---------------|--------------------|-----|

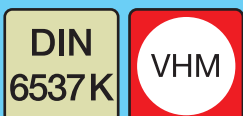
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Catalogue no.
Catalogue n°
Nr. di catalogo



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|---------|--|------------|------|---------------------|---------------------|-------------|---------|-------|-----------------|-----|
| 022 003 | | Typ SH60 + | ≤3xd | d ₁ = h7 | d ₂ = h6 | DIN 6535-HA | ~65 HRC | TiAIN | Ø 2,0 – 20,0 mm | 259 |
|---------|--|------------|------|---------------------|---------------------|-------------|---------|-------|-----------------|-----|



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|---------|--|----------|------|---------------------|---------------------|--|---------|--|-----------------|-----|
| 020 099 | | Typ SH70 | ≤5xd | d ₁ = h8 | d ₂ = h6 | | ~70 HRC | | Ø 2,4 – 18,6 mm | 261 |
|---------|--|----------|------|---------------------|---------------------|--|---------|--|-----------------|-----|



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|---------|--|--------|-----|------|---------------------|---------------------|---|--------------------------|-------|-----------------|-----|
| 024 003 | | Typ VA | IKZ | ≤3xd | d ₁ = h7 | d ₂ = h6 | DIN 6535-HA DIN 6535-HB DIN 6535-HE | ≤ 1200 N/mm ² | TiAIN | Ø 2,0 – 20,0 mm | 262 |
|---------|--|--------|-----|------|---------------------|---------------------|---|--------------------------|-------|-----------------|-----|

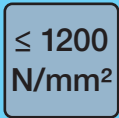
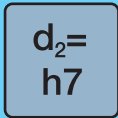
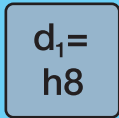
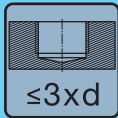


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|---------|--|--------|-----|------|---------------------|---------------------|---|--------------------------|-------|-----------------|-----|
| 024 005 | | Typ VA | IKZ | ≤5xd | d ₁ = h7 | d ₂ = h6 | DIN 6535-HA DIN 6535-HB DIN 6535-HE | ≤ 1200 N/mm ² | TiAIN | Ø 2,0 – 20,0 mm | 264 |
|---------|--|--------|-----|------|---------------------|---------------------|---|--------------------------|-------|-----------------|-----|

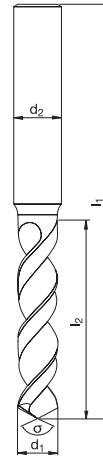
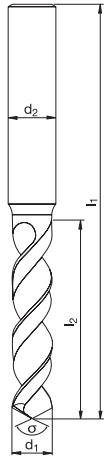


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|---------|--|--------|-----|-------|---------------------|---------------------|---|--------------------------|-------|-----------------|-----|
| 024 008 | | Typ VA | IKZ | ≤8xd | d ₁ = h7 | d ₂ = h6 | DIN 6535-HA DIN 6535-HB DIN 6535-HE | ≤ 1200 N/mm ² | TiAIN | Ø 3,0 – 20,0 mm | 266 |
| 024 012 | | Typ VA | IKZ | ≤12xd | d ₁ = h7 | d ₂ = h6 | DIN 6535-HA DIN 6535-HB DIN 6535-HE | ≤ 1200 N/mm ² | TiAIN | Ø 3,0 – 20,0 mm | 268 |
| 025 020 | | Typ VA | IKZ | ≤20xd | d ₁ = h7 | d ₂ = h6 | DIN 6535-HA DIN 6535-HB DIN 6535-HE | ≤ 1200 N/mm ² | TiAIN | Ø 3,0 – 12,0 mm | 270 |
| 025 030 | | Typ VA | IKZ | ≤30xd | d ₁ = h7 | d ₂ = h6 | DIN 6535-HA DIN 6535-HB DIN 6535-HE | ≤ 1200 N/mm ² | TiAIN | Ø 3,0 – 12,0 mm | 270 |
| 025 040 | | Typ VA | IKZ | ≤40xd | d ₁ = h7 | d ₂ = h6 | DIN 6535-HA | ≤ 1200 N/mm ² | TiAIN | Ø 3,0 – 9,0 mm | 271 |
| 025 050 | | Typ VA | IKZ | ≤50xd | d ₁ = h7 | d ₂ = h6 | DIN 6535-HA | ≤ 1200 N/mm ² | TiAIN | Ø 3,0 – 7,0 mm | 271 |

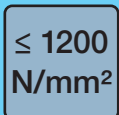
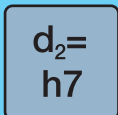
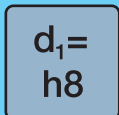
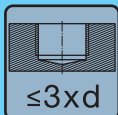




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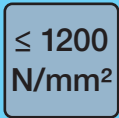
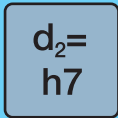
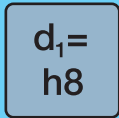
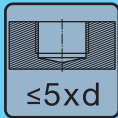


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|--|------------------------|--|------------------------|----------|---------------------------------------|------------------------|--|------------------------|--|----------|----------|---------------------------------------|--|
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | |
| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | | |
| 1 | 6 | 26 | 3 | 140° | 922 181 | 4,65 | 24 | 58 | 6 | 120° | 922 190 | | |
| 1,1 | 7 | 28 | 3 | 140° | 922 182 | 4,7 | 24 | 58 | 6 | 120° | 922 027 | | |
| 1,2 | 8 | 30 | 3 | 140° | 922 183 | 4,78 | 26 | 62 | 6 | 120° | 922 197 | | |
| 1,3 | 8 | 30 | 3 | 140° | 922 184 | 4,8 | 26 | 62 | 6 | 120° | 922 028 | | |
| 1,4 | 9 | 32 | 3 | 140° | 922 185 | 4,9 | 26 | 62 | 6 | 120° | 922 029 | | |
| 1,5 | 9 | 32 | 3 | 140° | 922 186 | 5 | 26 | 62 | 6 | 120° | 922 030 | | |
| 1,6 | 10 | 34 | 3 | 140° | 922 187 | 5,1 | 26 | 62 | 6 | 120° | 922 031 | | |
| 1,7 | 10 | 34 | 3 | 140° | 922 188 | 5,2 | 26 | 62 | 6 | 120° | 922 032 | | |
| 1,8 | 11 | 36 | 3 | 140° | 922 189 | 5,3 | 26 | 62 | 6 | 120° | 922 033 | | |
| 1,9 | 11 | 36 | 3 | 140° | 922 194 | 5,4 | 28 | 66 | 6 | 120° | 922 034 | | |
| 2 | 12 | 38 | 3 | 130° | 922 000 | 5,5 | 28 | 66 | 6 | 120° | 922 035 | | |
| 2,1 | 12 | 38 | 3 | 130° | 922 001 | 5,55 | 28 | 66 | 6 | 120° | 922 191 | | |
| 2,2 | 13 | 40 | 3 | 130° | 922 002 | 5,6 | 28 | 66 | 6 | 120° | 922 036 | | |
| 2,3 | 13 | 40 | 3 | 130° | 922 003 | 5,65 | 28 | 66 | 6 | 120° | 922 198 | | |
| 2,4 | 14 | 43 | 3 | 130° | 922 004 | 5,7 | 28 | 66 | 6 | 120° | 922 037 | | |
| 2,5 | 14 | 43 | 3 | 130° | 922 005 | 5,8 | 28 | 66 | 6 | 120° | 922 038 | | |
| 2,6 | 14 | 43 | 3 | 130° | 922 006 | 5,9 | 28 | 66 | 6 | 120° | 922 039 | | |
| 2,7 | 16 | 46 | 3 | 130° | 922 007 | 6 | 28 | 66 | 6 | 120° | 922 040 | | |
| 2,8 | 16 | 46 | 3 | 130° | 922 008 | 6,1 | 32 | 70 | 8 | 120° | 922 041 | | |
| 2,85 | 16 | 46 | 3 | 130° | 922 195 | 6,2 | 32 | 70 | 8 | 120° | 922 042 | | |
| 2,9 | 16 | 46 | 3 | 130° | 922 009 | 6,3 | 32 | 70 | 8 | 120° | 922 043 | | |
| 3 | 16 | 46 | 3 | 130° | 922 010 | 6,4 | 32 | 70 | 8 | 120° | 922 044 | | |
| 3,1 | 18 | 49 | 4 | 130° | 922 011 | 6,5 | 32 | 70 | 8 | 120° | 922 045 | | |
| 3,2 | 18 | 49 | 4 | 130° | 922 012 | 6,6 | 32 | 70 | 8 | 120° | 922 046 | | |
| 3,3 | 18 | 49 | 4 | 130° | 922 013 | 6,7 | 32 | 70 | 8 | 120° | 922 047 | | |
| 3,4 | 20 | 52 | 4 | 130° | 922 014 | 6,8 | 34 | 74 | 8 | 120° | 922 048 | | |
| 3,5 | 20 | 52 | 4 | 130° | 922 015 | 6,9 | 34 | 74 | 8 | 120° | 922 049 | | |
| 3,6 | 20 | 52 | 4 | 130° | 922 016 | 7 | 34 | 74 | 8 | 120° | 922 050 | | |
| 3,7 | 20 | 52 | 4 | 130° | 922 017 | 7,1 | 34 | 74 | 8 | 120° | 922 051 | | |
| 3,78 | 22 | 55 | 4 | 130° | 922 196 | 7,2 | 34 | 74 | 8 | 120° | 922 052 | | |
| 3,8 | 22 | 55 | 4 | 130° | 922 018 | 7,3 | 34 | 74 | 8 | 120° | 922 053 | | |
| 3,9 | 22 | 55 | 4 | 130° | 922 019 | 7,4 | 34 | 74 | 8 | 120° | 922 054 | | |
| 4 | 22 | 55 | 4 | 130° | 922 020 | 7,5 | 34 | 74 | 8 | 120° | 922 055 | | |
| 4,1 | 22 | 55 | 6 | 120° | 922 021 | 7,55 | 37 | 79 | 8 | 120° | 922 192 | | |
| 4,2 | 22 | 55 | 6 | 120° | 922 022 | 7,6 | 37 | 79 | 8 | 120° | 922 056 | | |
| 4,3 | 24 | 58 | 6 | 120° | 922 023 | 7,7 | 37 | 79 | 8 | 120° | 922 057 | | |
| 4,4 | 24 | 58 | 6 | 120° | 922 024 | 7,8 | 37 | 79 | 8 | 120° | 922 058 | | |
| 4,5 | 24 | 58 | 6 | 120° | 922 025 | 7,9 | 37 | 79 | 8 | 120° | 922 059 | | |
| 4,6 | 24 | 58 | 6 | 120° | 922 026 | 8 | 37 | 79 | 8 | 120° | 922 060 | | |

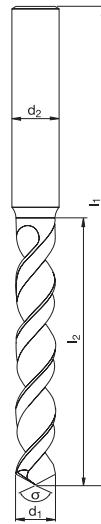
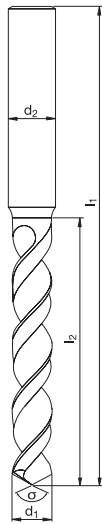


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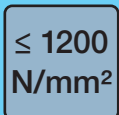
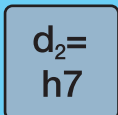
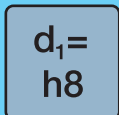
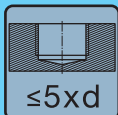
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|---|----------------------|----------------------|----------------------|----------|--|----------------------|----------------------|----------------------|----------------------|---|-------------|----------------------|----------------------|----------------------|--|----------|-------------|--|--|
| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | |
| | | | | | 1.1–1.6; 2.1–2.3; 3.1–3.3; 4.1–4.5 | | | | | | | | | | 1.1–1.6; 2.1–2.3; 3.1–3.3; 4.1–4.5 | | | | |
| d₁ | l₂ | l₁ | d₂ | σ | Code | d₁ | l₂ | l₁ | d₂ | σ | Code | d₁ | l₂ | l₁ | d₂ | σ | Code | | |
| [mm] | [mm] | [mm] | [mm] | [°] | | [mm] | [mm] | [mm] | [mm] | [°] | | [mm] | [mm] | [mm] | [mm] | [°] | | | |
| 8,1 | 37 | 79 | 10 | 120° | 922 061 | 11,8 | 47 | 95 | 12 | 120° | 922 098 | | | | | | | | |
| 8,2 | 37 | 79 | 10 | 120° | 922 062 | 11,9 | 47 | 95 | 12 | 120° | 922 099 | | | | | | | | |
| 8,3 | 37 | 79 | 10 | 120° | 922 063 | 12 | 51 | 102 | 12 | 120° | 922 100 | | | | | | | | |
| 8,4 | 37 | 79 | 10 | 120° | 922 064 | 12,1 | 51 | 102 | 12 | 120° | 922 101 | | | | | | | | |
| 8,5 | 37 | 79 | 10 | 120° | 922 065 | 12,2 | 51 | 102 | 12 | 120° | 922 102 | | | | | | | | |
| 8,6 | 40 | 84 | 10 | 120° | 922 066 | 12,3 | 51 | 102 | 12 | 120° | 922 103 | | | | | | | | |
| 8,7 | 40 | 84 | 10 | 120° | 922 067 | 12,4 | 51 | 102 | 12 | 120° | 922 104 | | | | | | | | |
| 8,8 | 40 | 84 | 10 | 120° | 922 068 | 12,5 | 51 | 102 | 12 | 120° | 922 105 | | | | | | | | |
| 8,9 | 40 | 84 | 10 | 120° | 922 069 | 12,6 | 51 | 102 | 12 | 120° | 922 106 | | | | | | | | |
| 9 | 40 | 84 | 10 | 120° | 922 070 | 12,7 | 51 | 102 | 12 | 120° | 922 107 | | | | | | | | |
| 9,1 | 40 | 84 | 10 | 120° | 922 071 | 12,8 | 51 | 102 | 12 | 120° | 922 108 | | | | | | | | |
| 9,2 | 40 | 84 | 10 | 120° | 922 072 | 12,9 | 51 | 102 | 12 | 120° | 922 109 | | | | | | | | |
| 9,3 | 40 | 84 | 10 | 120° | 922 073 | 13 | 51 | 102 | 12 | 120° | 922 110 | | | | | | | | |
| 9,4 | 40 | 84 | 10 | 120° | 922 074 | 13,5 | 54 | 107 | 16 | 120° | 922 115 | | | | | | | | |
| 9,5 | 40 | 84 | 10 | 120° | 922 075 | 14 | 54 | 107 | 16 | 120° | 922 120 | | | | | | | | |
| 9,55 | 43 | 89 | 10 | 120° | 922 193 | 14,5 | 56 | 111 | 16 | 120° | 922 125 | | | | | | | | |
| 9,6 | 43 | 89 | 10 | 120° | 922 076 | 15 | 56 | 111 | 16 | 120° | 922 130 | | | | | | | | |
| 9,7 | 43 | 89 | 10 | 120° | 922 077 | 15,5 | 58 | 115 | 16 | 120° | 922 135 | | | | | | | | |
| 9,8 | 43 | 89 | 10 | 120° | 922 078 | 16 | 58 | 115 | 16 | 120° | 922 140 | | | | | | | | |
| 9,9 | 43 | 89 | 10 | 120° | 922 079 | 16,5 | 60 | 119 | 20 | 120° | 922 145 | | | | | | | | |
| 10 | 43 | 89 | 10 | 120° | 922 080 | 17 | 60 | 119 | 20 | 120° | 922 150 | | | | | | | | |
| 10,1 | 43 | 89 | 10 | 120° | 922 081 | 17,5 | 62 | 123 | 20 | 120° | 922 155 | | | | | | | | |
| 10,2 | 43 | 89 | 10 | 120° | 922 082 | 18 | 62 | 123 | 20 | 120° | 922 160 | | | | | | | | |
| 10,3 | 43 | 89 | 10 | 120° | 922 083 | 18,5 | 64 | 127 | 20 | 120° | 922 165 | | | | | | | | |
| 10,4 | 43 | 89 | 10 | 120° | 922 084 | 19 | 64 | 127 | 20 | 120° | 922 170 | | | | | | | | |
| 10,5 | 43 | 89 | 10 | 120° | 922 085 | 19,5 | 66 | 131 | 20 | 120° | 922 175 | | | | | | | | |
| 10,6 | 43 | 89 | 12 | 120° | 922 086 | 20 | 66 | 131 | 20 | 120° | 922 180 | | | | | | | | |
| 10,7 | 47 | 95 | 12 | 120° | 922 087 | | | | | | | | | | | | | | |
| 10,8 | 47 | 95 | 12 | 120° | 922 088 | | | | | | | | | | | | | | |
| 10,9 | 47 | 95 | 12 | 120° | 922 089 | | | | | | | | | | | | | | |
| 11 | 47 | 95 | 12 | 120° | 922 090 | | | | | | | | | | | | | | |
| 11,1 | 47 | 95 | 12 | 120° | 922 091 | | | | | | | | | | | | | | |
| 11,2 | 47 | 95 | 12 | 120° | 922 092 | | | | | | | | | | | | | | |
| 11,25 | 47 | 95 | 12 | 120° | 922 199 | | | | | | | | | | | | | | |
| 11,3 | 47 | 95 | 12 | 120° | 922 093 | | | | | | | | | | | | | | |
| 11,4 | 47 | 95 | 12 | 120° | 922 094 | | | | | | | | | | | | | | |
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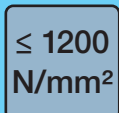
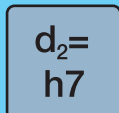
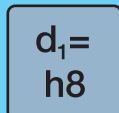
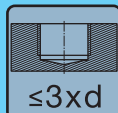
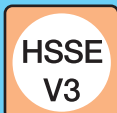


| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 527 100 ⁶²⁰ | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 527 100 ⁶²⁰ | | | | | |
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| Catalogue n° ^{W%} | | TiAlN | | Catalogue n° ^{W%} | | TiAlN | | | | | |
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| | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | | |
| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
| 2 | 24 | 56 | 3 | 130° | 928 000 | 5,9 | 57 | 93 | 6 | 120° | 928 039 |
| 2,1 | 24 | 56 | 3 | 130° | 928 001 | 6 | 57 | 93 | 6 | 120° | 928 040 |
| 2,2 | 27 | 56 | 3 | 130° | 928 002 | 6,1 | 63 | 101 | 8 | 120° | 928 041 |
| 2,3 | 27 | 56 | 3 | 130° | 928 003 | 6,2 | 63 | 101 | 8 | 120° | 928 042 |
| 2,4 | 30 | 57 | 3 | 130° | 928 004 | 6,3 | 63 | 101 | 8 | 120° | 928 043 |
| 2,5 | 30 | 57 | 3 | 130° | 928 005 | 6,4 | 63 | 101 | 8 | 120° | 928 044 |
| 2,6 | 30 | 57 | 3 | 130° | 928 006 | 6,5 | 63 | 101 | 8 | 120° | 928 045 |
| 2,7 | 33 | 57 | 3 | 130° | 928 007 | 6,6 | 63 | 101 | 8 | 120° | 928 046 |
| 2,8 | 33 | 61 | 3 | 130° | 928 008 | 6,7 | 63 | 101 | 8 | 120° | 928 047 |
| 2,9 | 33 | 61 | 3 | 130° | 928 009 | 6,8 | 69 | 109 | 8 | 120° | 928 048 |
| 3 | 33 | 61 | 3 | 130° | 928 010 | 6,9 | 69 | 109 | 8 | 120° | 928 049 |
| 3,1 | 36 | 65 | 4 | 130° | 928 011 | 7 | 69 | 109 | 8 | 120° | 928 050 |
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| 3,3 | 36 | 65 | 4 | 130° | 928 013 | 7,2 | 69 | 109 | 8 | 120° | 928 052 |
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| 5,7 | 57 | 93 | 6 | 120° | 928 037 | 9,6 | 87 | 133 | 10 | 120° | 928 076 |
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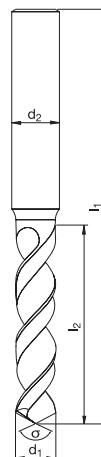
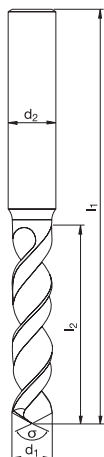
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| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | 527 100 ⁶²⁰ TiAlN | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | 527 100 ⁶²⁰ TiAlN | | | | |
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| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | |
| 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | | Code | | | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | | Code | | | | |
| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | | |
| 9,8 | 87 | 133 | 10 | 120° | 928 078 | 16,5 | 125 | 184 | 20 | 120° | 928 145 | | | | | | | | |
| 9,9 | 87 | 133 | 10 | 120° | 928 079 | 17 | 125 | 184 | 20 | 120° | 928 150 | | | | | | | | |
| 10 | 87 | 133 | 10 | 120° | 928 080 | 17,5 | 130 | 191 | 20 | 120° | 928 155 | | | | | | | | |
| 10,1 | 87 | 133 | 10 | 120° | 928 081 | 18 | 130 | 191 | 20 | 120° | 928 160 | | | | | | | | |
| 10,2 | 87 | 133 | 10 | 120° | 928 082 | 18,5 | 135 | 198 | 20 | 120° | 928 165 | | | | | | | | |
| 10,3 | 87 | 133 | 10 | 120° | 928 083 | 19 | 135 | 198 | 20 | 120° | 928 170 | | | | | | | | |
| 10,4 | 87 | 133 | 10 | 120° | 928 084 | 19,5 | 140 | 205 | 20 | 120° | 928 175 | | | | | | | | |
| 10,5 | 87 | 133 | 10 | 120° | 928 085 | 20 | 140 | 205 | 20 | 120° | 928 180 | | | | | | | | |
| 10,6 | 87 | 133 | 12 | 120° | 928 086 | | | | | | | | | | | | | | |
| 10,7 | 94 | 142 | 12 | 120° | 928 087 | | | | | | | | | | | | | | |
| 10,8 | 94 | 142 | 12 | 120° | 928 088 | | | | | | | | | | | | | | |
| 10,9 | 94 | 142 | 12 | 120° | 928 089 | | | | | | | | | | | | | | |
| 11 | 94 | 142 | 12 | 120° | 928 090 | | | | | | | | | | | | | | |
| 11,1 | 94 | 142 | 12 | 120° | 928 091 | | | | | | | | | | | | | | |
| 11,2 | 94 | 142 | 12 | 120° | 928 092 | | | | | | | | | | | | | | |
| 11,3 | 94 | 142 | 12 | 120° | 928 093 | | | | | | | | | | | | | | |
| 11,4 | 94 | 142 | 12 | 120° | 928 094 | | | | | | | | | | | | | | |
| 11,5 | 94 | 142 | 12 | 120° | 928 095 | | | | | | | | | | | | | | |
| 11,6 | 94 | 142 | 12 | 120° | 928 096 | | | | | | | | | | | | | | |
| 11,7 | 94 | 142 | 12 | 120° | 928 097 | | | | | | | | | | | | | | |
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| 11,9 | 101 | 151 | 12 | 120° | 928 099 | | | | | | | | | | | | | | |
| 12 | 101 | 151 | 12 | 120° | 928 100 | | | | | | | | | | | | | | |
| 12,1 | 101 | 151 | 12 | 120° | 928 101 | | | | | | | | | | | | | | |
| 12,2 | 101 | 151 | 12 | 120° | 928 102 | | | | | | | | | | | | | | |
| 12,3 | 101 | 151 | 12 | 120° | 928 103 | | | | | | | | | | | | | | |
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| 12,5 | 101 | 151 | 12 | 120° | 928 105 | | | | | | | | | | | | | | |
| 12,6 | 101 | 151 | 12 | 120° | 928 106 | | | | | | | | | | | | | | |
| 12,7 | 101 | 151 | 12 | 120° | 928 107 | | | | | | | | | | | | | | |
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| 12,9 | 101 | 151 | 12 | 120° | 928 109 | | | | | | | | | | | | | | |
| 13 | 101 | 151 | 12 | 120° | 928 110 | | | | | | | | | | | | | | |
| 13,5 | 108 | 160 | 16 | 120° | 928 115 | | | | | | | | | | | | | | |
| 14 | 108 | 160 | 16 | 120° | 928 120 | | | | | | | | | | | | | | |
| 14,5 | 114 | 169 | 16 | 120° | 928 125 | | | | | | | | | | | | | | |
| 15 | 114 | 169 | 16 | 120° | 928 130 | | | | | | | | | | | | | | |
| 15,5 | 120 | 178 | 16 | 120° | 928 135 | | | | | | | | | | | | | | |
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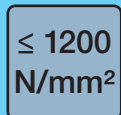
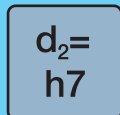
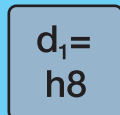
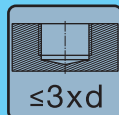
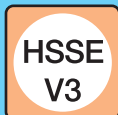
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semi-bold = Semistandard
demi-gras = Semistandard
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| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 529 000 ⁶²⁰ | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 529 000 ⁶²⁰ | | | | | |
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| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | |
| | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | | |
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| 0,68 | 5 | 38 | 3 | 150° | 923 668 | 1,07 | 7 | 39 | 3 | 140° | 923 007 |
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| 0,88 | 6 | 38 | 3 | 150° | 923 688 | 1,27 | 8 | 40 | 3 | 140° | 923 025 |





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semi-bold = Semistandard
demi-gras = Semistandard
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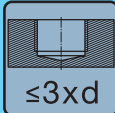
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| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | |
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| 1,28 | 8 | 40 | 3 | 140° | 923 026 | 1,67 | 10 | 42 | 3 | 140° | 923 061 | 1,67 | 10 | 42 | 3 | 140° | 923 061 | | |
| 1,29 | 8 | 40 | 3 | 140° | 923 027 | 1,68 | 10 | 42 | 3 | 140° | 923 062 | 1,68 | 10 | 42 | 3 | 140° | 923 062 | | |
| 1,3 | 8 | 40 | 3 | 140° | 920 184 | 1,69 | 10 | 42 | 3 | 140° | 923 506 | 1,69 | 10 | 42 | 3 | 140° | 923 506 | | |
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| 1,32 | 8 | 40 | 3 | 140° | 923 029 | 1,71 | 11 | 43 | 3 | 140° | 923 063 | 1,71 | 11 | 43 | 3 | 140° | 923 063 | | |
| 1,33 | 9 | 41 | 3 | 140° | 923 030 | 1,72 | 11 | 43 | 3 | 140° | 923 064 | 1,72 | 11 | 43 | 3 | 140° | 923 064 | | |
| 1,34 | 9 | 41 | 3 | 140° | 923 031 | 1,73 | 11 | 43 | 3 | 140° | 923 065 | 1,73 | 11 | 43 | 3 | 140° | 923 065 | | |
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| 1,48 | 9 | 41 | 3 | 140° | 923 044 | 1,87 | 11 | 43 | 3 | 140° | 923 078 | 1,87 | 11 | 43 | 3 | 140° | 923 078 | | |
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| 1,5 | 9 | 41 | 3 | 140° | 920 186 | 1,89 | 11 | 43 | 3 | 140° | 923 080 | 1,89 | 11 | 43 | 3 | 140° | 923 080 | | |
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| 1,52 | 10 | 42 | 3 | 140° | 923 047 | 1,91 | 12 | 44 | 3 | 140° | 923 081 | 1,91 | 12 | 44 | 3 | 140° | 923 081 | | |
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| 1,64 | 10 | 42 | 3 | 140° | 923 058 | 2,03 | 12 | 44 | 3 | 130° | 923 092 | 2,03 | 12 | 44 | 3 | 130° | 923 092 | | |
| 1,65 | 10 | 42 | 3 | 140° | 923 059 | 2,04 | 12 | 44 | 3 | 130° | 923 093 | 2,04 | 12 | 44 | 3 | 130° | 923 093 | | |
| 1,66 | 10 | 42 | 3 | 140° | 923 060 | 2,05 | 12 | 44 | 3 | 130° | 923 094 | 2,05 | 12 | 44 | 3 | 130° | 923 094 | | |

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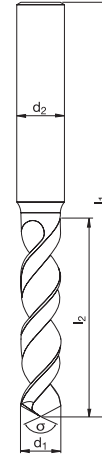
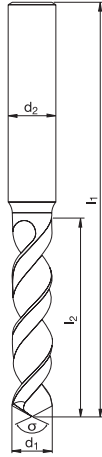
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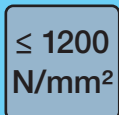
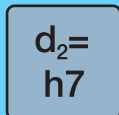
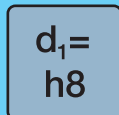
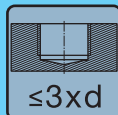
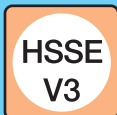
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halbfett = Semistandard
semi-bold = Semistandard
demi-gras = Semistandard
in chiaro = Semistandard

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| Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | 529 000 ⁶²⁰ | Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | | | | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | 529 000 ⁶²⁰ | | | |
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| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | |
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| 2,07 | 12 | 44 | 3 | 130° | 923 096 | 2,46 | 14 | 46 | 3 | 130° | 923 131 | | | | | | |
| 2,08 | 12 | 44 | 3 | 130° | 923 097 | 2,47 | 14 | 46 | 3 | 130° | 923 132 | | | | | | |
| 2,09 | 12 | 44 | 3 | 130° | 923 098 | 2,48 | 14 | 46 | 3 | 130° | 923 133 | | | | | | |
| 2,1 | 12 | 44 | 3 | 130° | 920 001 | 2,49 | 14 | 46 | 3 | 130° | 923 134 | | | | | | |
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| 2,13 | 13 | 45 | 3 | 130° | 923 101 | 2,52 | 14 | 46 | 3 | 130° | 923 136 | | | | | | |
| 2,14 | 13 | 45 | 3 | 130° | 923 102 | 2,53 | 14 | 46 | 3 | 130° | 923 137 | | | | | | |
| 2,15 | 13 | 45 | 3 | 130° | 923 103 | 2,54 | 14 | 46 | 3 | 130° | 923 138 | | | | | | |
| 2,16 | 13 | 45 | 3 | 130° | 923 104 | 2,55 | 14 | 46 | 3 | 130° | 923 139 | | | | | | |
| 2,17 | 13 | 45 | 3 | 130° | 923 105 | 2,56 | 14 | 46 | 3 | 130° | 923 140 | | | | | | |
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| 2,2 | 13 | 45 | 3 | 130° | 920 002 | 2,59 | 14 | 46 | 3 | 130° | 923 143 | | | | | | |
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| 2,22 | 13 | 45 | 3 | 130° | 923 109 | 2,61 | 14 | 46 | 3 | 130° | 923 144 | | | | | | |
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| 2,24 | 13 | 45 | 3 | 130° | 923 111 | 2,63 | 14 | 46 | 3 | 130° | 923 146 | | | | | | |
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| 2,38 | 14 | 46 | 3 | 130° | 923 124 | 2,77 | 16 | 48 | 3 | 130° | 923 159 | | | | | | |
| 2,39 | 14 | 46 | 3 | 130° | 923 125 | 2,78 | 16 | 48 | 3 | 130° | 923 160 | | | | | | |
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| 2,42 | 14 | 46 | 3 | 130° | 923 127 | 2,81 | 16 | 48 | 3 | 130° | 923 162 | | | | | | |
| 2,43 | 14 | 46 | 3 | 130° | 923 128 | 2,82 | 16 | 48 | 3 | 130° | 923 163 | | | | | | |
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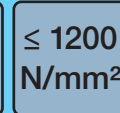
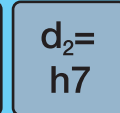
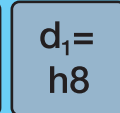
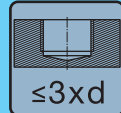
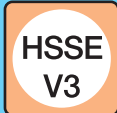


halbfett = Semistandard
semi-bold = Semistandard
demi-gras = Semistandard
in chiaro = Semistandard

| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | 529 000 ⁶²⁰ TiN | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | 529 000 ⁶²⁰ TiN | | | | |
|---|------------------------------|------------------------------|------------------------------|-----------------|---|------------------------------|------------------------------|------------------------------|------------------------------|---|-----------------|--|--|--|---|--|--|--|--|
| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | 1.1–1.6; 2.1–2.3; 3.1–3.3; 4.1–4.5 | | | | | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | 1.1–1.6; 2.1–2.3; 3.1–3.3; 4.1–4.5 | | | | |
| d₁ [mm] | l₂ [mm] | l₁ [mm] | d₂ [mm] | σ [°] | Code | d₁ [mm] | l₂ [mm] | l₁ [mm] | d₂ [mm] | σ [°] | Code | | | | | | | | |
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| 2,85 | 16 | 48 | 3 | 130° | 923 166 | 3,24 | 18 | 50 | 4 | 130° | 923 201 | | | | | | | | |
| 2,86 | 16 | 48 | 3 | 130° | 923 167 | 3,25 | 18 | 50 | 4 | 130° | 923 202 | | | | | | | | |
| 2,87 | 16 | 48 | 3 | 130° | 923 168 | 3,26 | 18 | 50 | 4 | 130° | 923 203 | | | | | | | | |
| 2,88 | 16 | 48 | 3 | 130° | 923 169 | 3,27 | 18 | 50 | 4 | 130° | 923 204 | | | | | | | | |
| 2,89 | 16 | 48 | 3 | 130° | 923 170 | 3,28 | 18 | 50 | 4 | 130° | 923 205 | | | | | | | | |
| 2,9 | 16 | 48 | 3 | 130° | 920 009 | 3,29 | 18 | 50 | 4 | 130° | 923 206 | | | | | | | | |
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| 3,13 | 18 | 50 | 4 | 130° | 923 191 | 3,52 | 20 | 52 | 4 | 130° | 923 226 | | | | | | | | |
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| 3,18 | 18 | 50 | 4 | 130° | 923 196 | 3,57 | 20 | 52 | 4 | 130° | 923 231 | | | | | | | | |
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| 3,2 | 18 | 50 | 4 | 130° | 920 012 | 3,59 | 20 | 52 | 4 | 130° | 923 233 | | | | | | | | |
| 3,21 | 18 | 50 | 4 | 130° | 923 198 | 3,6 | 20 | 52 | 4 | 130° | 920 016 | | | | | | | | |
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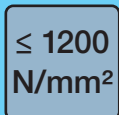
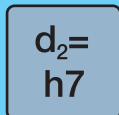
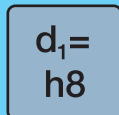
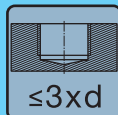
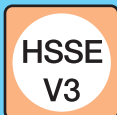




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| 3,88 | 22 | 54 | 4 | 130° | 923 259 | 4,27 | 24 | 68 | 6 | 120° | 923 294 | | | | | | | | | | | | | | | | | | |
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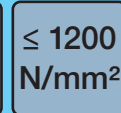
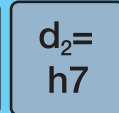
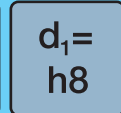
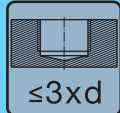


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semi-bold = Semistandard
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| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | 529 000 ⁶²⁰ TiN | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | 529 000 ⁶²⁰ TiN | | | | |
|---|----------------|----------------|----------------|------|---|----------------|----------------|----------------|----------------|---|---------|----------------|----------------|----------------|---|------|---------|--|--|
| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | |
| d ₁ | l ₂ | l ₁ | d ₂ | σ | Code | d ₁ | l ₂ | l ₁ | d ₂ | σ | Code | d ₁ | l ₂ | l ₁ | d ₂ | σ | Code | | |
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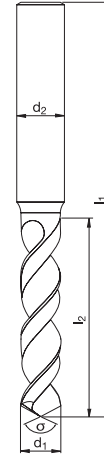
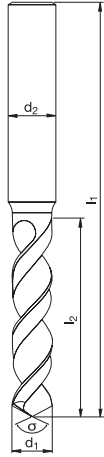
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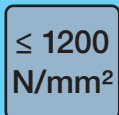
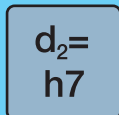
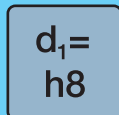
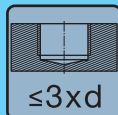
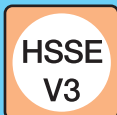


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semi-bold = Semistandard
demi-gras = Semistandard
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| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 529 000 ⁶²⁰ | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 529 000 ⁶²⁰ | | | | | |
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| 5,41 | 28 | 72 | 6 | 120° | 923 395 | 5,8 | 28 | 72 | 6 | 120° | 920 038 |
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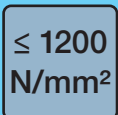
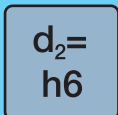
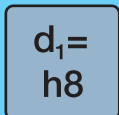
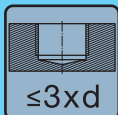
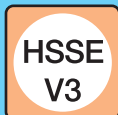


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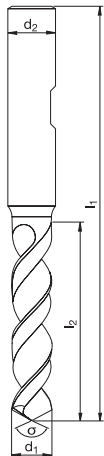
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|---|----------------|----------------|----------------|------|---|----------------|----------------|----------------|----------------|---|---------|----------------|----------------|----------------|---|-----|------|--|--|
| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | |
| d ₁ | l ₂ | l ₁ | d ₂ | σ | Code | d ₁ | l ₂ | l ₁ | d ₂ | σ | Code | d ₁ | l ₂ | l ₁ | d ₂ | σ | Code | | |
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| 5,98 | 28 | 72 | 6 | 120° | 923 446 | 9,55 | 43 | 93 | 10 | 120° | 920 193 | | | | | | | | |
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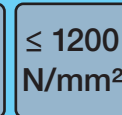
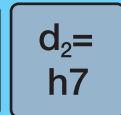
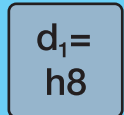
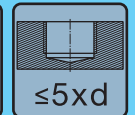


Katalog-Nr. ^{W%} Catalogue no. ^{W%} **529 000**⁶²⁰
 Catalogue n° ^{W%} Nr. di catalogo ^{W%} **TiN**

Werkstoffgruppen Classification of work materials 1.1–1.6; 2.1–2.3;
 Groupes de matières Gruppo materiali 3.1–3.3; 4.1–4.5

| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
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| 12,2 | 51 | 111 | 16 | 120° | 920 202 |
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| 12,8 | 51 | 111 | 16 | 120° | 920 208 |
| 12,9 | 51 | 111 | 16 | 120° | 920 209 |
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| 15,5 | 58 | 118 | 16 | 120° | 920 235 |
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| 16,5 | 60 | 126 | 20 | 120° | 920 245 |
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| 18,5 | 64 | 130 | 20 | 120° | 920 265 |
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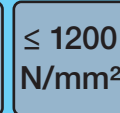
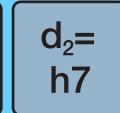
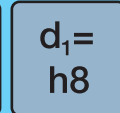
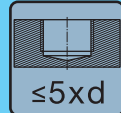
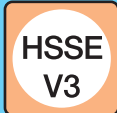


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| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | | | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | | | 529 100⁶²⁰ TiN | | | | | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | | | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | | | 529 100⁶²⁰ TiN | | | | |
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| 2 | 24 | 56 | 3 | 130° | 921 000 | 2,39 | 30 | 62 | 3 | 130° | 924 125 | | | | | | | | | | | | | | | | | | |
| 2,01 | 24 | 56 | 3 | 130° | 924 090 | 2,4 | 30 | 62 | 3 | 130° | 921 004 | | | | | | | | | | | | | | | | | | |
| 2,02 | 24 | 56 | 3 | 130° | 924 091 | 2,41 | 30 | 62 | 3 | 130° | 924 126 | | | | | | | | | | | | | | | | | | |
| 2,03 | 24 | 56 | 3 | 130° | 924 092 | 2,42 | 30 | 62 | 3 | 130° | 924 127 | | | | | | | | | | | | | | | | | | |
| 2,04 | 24 | 56 | 3 | 130° | 924 093 | 2,43 | 30 | 62 | 3 | 130° | 924 128 | | | | | | | | | | | | | | | | | | |
| 2,05 | 24 | 56 | 3 | 130° | 924 094 | 2,44 | 30 | 62 | 3 | 130° | 924 129 | | | | | | | | | | | | | | | | | | |
| 2,06 | 24 | 56 | 3 | 130° | 924 095 | 2,45 | 30 | 62 | 3 | 130° | 924 130 | | | | | | | | | | | | | | | | | | |
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| 2,12 | 24 | 56 | 3 | 130° | 924 100 | 2,51 | 30 | 62 | 3 | 130° | 924 135 | | | | | | | | | | | | | | | | | | |
| 2,13 | 27 | 59 | 3 | 130° | 924 101 | 2,52 | 30 | 62 | 3 | 130° | 924 136 | | | | | | | | | | | | | | | | | | |
| 2,14 | 27 | 59 | 3 | 130° | 924 102 | 2,53 | 30 | 62 | 3 | 130° | 924 137 | | | | | | | | | | | | | | | | | | |
| 2,15 | 27 | 59 | 3 | 130° | 924 103 | 2,54 | 30 | 62 | 3 | 130° | 924 138 | | | | | | | | | | | | | | | | | | |
| 2,16 | 27 | 59 | 3 | 130° | 924 104 | 2,55 | 30 | 62 | 3 | 130° | 924 139 | | | | | | | | | | | | | | | | | | |
| 2,17 | 27 | 59 | 3 | 130° | 924 105 | 2,56 | 30 | 62 | 3 | 130° | 924 140 | | | | | | | | | | | | | | | | | | |
| 2,18 | 27 | 59 | 3 | 130° | 924 106 | 2,57 | 30 | 62 | 3 | 130° | 924 141 | | | | | | | | | | | | | | | | | | |
| 2,19 | 27 | 59 | 3 | 130° | 924 107 | 2,58 | 30 | 62 | 3 | 130° | 924 142 | | | | | | | | | | | | | | | | | | |
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| 2,21 | 27 | 59 | 3 | 130° | 924 108 | 2,6 | 30 | 62 | 3 | 130° | 921 006 | | | | | | | | | | | | | | | | | | |
| 2,22 | 27 | 59 | 3 | 130° | 924 109 | 2,61 | 30 | 62 | 3 | 130° | 924 144 | | | | | | | | | | | | | | | | | | |
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| 2,24 | 27 | 59 | 3 | 130° | 924 111 | 2,63 | 30 | 62 | 3 | 130° | 924 146 | | | | | | | | | | | | | | | | | | |
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| 2,26 | 27 | 59 | 3 | 130° | 924 113 | 2,65 | 30 | 62 | 3 | 130° | 924 148 | | | | | | | | | | | | | | | | | | |
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| 2,31 | 27 | 59 | 3 | 130° | 924 117 | 2,7 | 33 | 65 | 3 | 130° | 921 007 | | | | | | | | | | | | | | | | | | |
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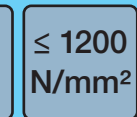
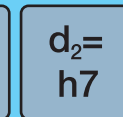
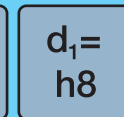
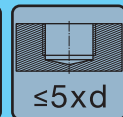
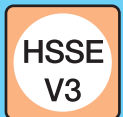




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| Werkstoffgruppen | | Classification of work materials | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | | Werkstoffgruppen | | Classification of work materials | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | |
| Groupes de matières | | Gruppo materiali | | | | | | | | Groupes de matières | | Gruppo materiali | | | | | | | |
| d ₁ | l ₂ | l ₁ | d ₂ | σ | Code | | | | | d ₁ | l ₂ | l ₁ | d ₂ | σ | Code | | | | |
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| 2,78 | 33 | 65 | 3 | 130° | 924 160 | | | | | 3,17 | 36 | 68 | 4 | 130° | 924 195 | | | | |
| 2,79 | 33 | 65 | 3 | 130° | 924 161 | | | | | 3,18 | 36 | 68 | 4 | 130° | 924 196 | | | | |
| 2,8 | 33 | 65 | 3 | 130° | 921 008 | | | | | 3,19 | 36 | 68 | 4 | 130° | 924 197 | | | | |
| 2,81 | 33 | 65 | 3 | 130° | 924 162 | | | | | 3,2 | 36 | 68 | 4 | 130° | 921 012 | | | | |
| 2,82 | 33 | 65 | 3 | 130° | 924 163 | | | | | 3,21 | 36 | 68 | 4 | 130° | 924 198 | | | | |
| 2,83 | 33 | 65 | 3 | 130° | 924 164 | | | | | 3,22 | 36 | 68 | 4 | 130° | 924 199 | | | | |
| 2,84 | 33 | 65 | 3 | 130° | 924 165 | | | | | 3,23 | 36 | 68 | 4 | 130° | 924 200 | | | | |
| 2,85 | 33 | 65 | 3 | 130° | 924 166 | | | | | 3,24 | 36 | 68 | 4 | 130° | 924 201 | | | | |
| 2,86 | 33 | 65 | 3 | 130° | 924 167 | | | | | 3,25 | 36 | 68 | 4 | 130° | 924 202 | | | | |
| 2,87 | 33 | 65 | 3 | 130° | 924 168 | | | | | 3,26 | 36 | 68 | 4 | 130° | 924 203 | | | | |
| 2,88 | 33 | 65 | 3 | 130° | 924 169 | | | | | 3,27 | 36 | 68 | 4 | 130° | 924 204 | | | | |
| 2,89 | 33 | 65 | 3 | 130° | 924 170 | | | | | 3,28 | 36 | 68 | 4 | 130° | 924 205 | | | | |
| 2,9 | 33 | 65 | 3 | 130° | 921 009 | | | | | 3,29 | 36 | 68 | 4 | 130° | 924 206 | | | | |
| 2,91 | 33 | 65 | 3 | 130° | 924 171 | | | | | 3,3 | 36 | 68 | 4 | 130° | 921 013 | | | | |
| 2,92 | 33 | 65 | 3 | 130° | 924 172 | | | | | 3,31 | 36 | 68 | 4 | 130° | 924 207 | | | | |
| 2,93 | 33 | 65 | 3 | 130° | 924 173 | | | | | 3,32 | 36 | 68 | 4 | 130° | 924 208 | | | | |
| 2,94 | 33 | 65 | 3 | 130° | 924 174 | | | | | 3,33 | 36 | 68 | 4 | 130° | 924 209 | | | | |
| 2,95 | 33 | 65 | 3 | 130° | 924 175 | | | | | 3,34 | 36 | 68 | 4 | 130° | 924 210 | | | | |
| 2,96 | 33 | 65 | 3 | 130° | 924 176 | | | | | 3,35 | 36 | 68 | 4 | 130° | 924 211 | | | | |
| 2,97 | 33 | 65 | 3 | 130° | 924 177 | | | | | 3,36 | 39 | 71 | 4 | 130° | 924 212 | | | | |
| 2,98 | 33 | 65 | 3 | 130° | 924 178 | | | | | 3,37 | 39 | 71 | 4 | 130° | 924 213 | | | | |
| 2,99 | 33 | 65 | 3 | 130° | 924 179 | | | | | 3,38 | 39 | 71 | 4 | 130° | 924 214 | | | | |
| 3 | 33 | 65 | 3 | 130° | 921 010 | | | | | 3,39 | 39 | 71 | 4 | 130° | 924 215 | | | | |
| 3,01 | 36 | 68 | 4 | 130° | 924 180 | | | | | 3,4 | 39 | 71 | 4 | 130° | 921 014 | | | | |
| 3,02 | 36 | 68 | 4 | 130° | 924 181 | | | | | 3,41 | 39 | 71 | 4 | 130° | 924 216 | | | | |
| 3,03 | 36 | 68 | 4 | 130° | 924 182 | | | | | 3,42 | 39 | 71 | 4 | 130° | 924 217 | | | | |
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| 3,05 | 36 | 68 | 4 | 130° | 924 184 | | | | | 3,44 | 39 | 71 | 4 | 130° | 924 219 | | | | |
| 3,06 | 36 | 68 | 4 | 130° | 924 185 | | | | | 3,45 | 39 | 71 | 4 | 130° | 924 220 | | | | |
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| 3,13 | 36 | 68 | 4 | 130° | 924 191 | | | | | 3,52 | 39 | 71 | 4 | 130° | 924 226 | | | | |
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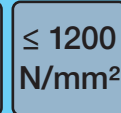
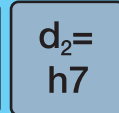
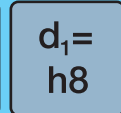
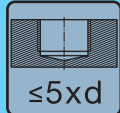


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semi-bold = Semistandard
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|---|------------------------|--|------------------------|---|---------|--|------------------------|------------------------|------------------------|----------|---------|
| Catalogue n° ^{W%} Nr. di catalogo ^{W%} | | TiN | | Catalogue n° ^{W%} Nr. di catalogo ^{W%} | | TiN | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | |
| | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | | |
| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
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| 3,59 | 39 | 71 | 4 | 130° | 924 233 | 3,98 | 43 | 75 | 4 | 130° | 924 268 |
| 3,6 | 39 | 71 | 4 | 130° | 921 016 | 3,99 | 43 | 75 | 4 | 130° | 924 269 |
| 3,61 | 39 | 71 | 4 | 130° | 924 234 | 4 | 43 | 75 | 4 | 130° | 921 020 |
| 3,62 | 39 | 71 | 4 | 130° | 924 235 | 4,01 | 43 | 87 | 6 | 120° | 924 270 |
| 3,63 | 39 | 71 | 4 | 130° | 924 236 | 4,02 | 43 | 87 | 6 | 120° | 924 271 |
| 3,64 | 39 | 71 | 4 | 130° | 924 237 | 4,03 | 43 | 87 | 6 | 120° | 924 272 |
| 3,65 | 39 | 71 | 4 | 130° | 924 238 | 4,04 | 43 | 87 | 6 | 120° | 924 273 |
| 3,66 | 39 | 71 | 4 | 130° | 924 239 | 4,05 | 43 | 87 | 6 | 120° | 924 274 |
| 3,67 | 39 | 71 | 4 | 130° | 924 240 | 4,06 | 43 | 87 | 6 | 120° | 924 275 |
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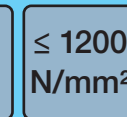
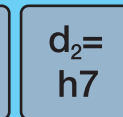
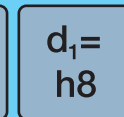
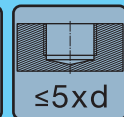
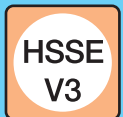




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semi-bold = Semistandard
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| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | |
| d₁ [mm] | | | | | l₂ [mm] | | | | | l₁ [mm] | | | | | d₂ [mm] | | | | | σ [°] | | | | | | | | | |
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| 4,43 | 47 | 91 | 6 | 120° | 924 308 | 4,82 | 52 | 96 | 6 | 120° | 924 342 | | | | | | | | | | | | | | | | | | |
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| 4,45 | 47 | 91 | 6 | 120° | 924 310 | 4,84 | 52 | 96 | 6 | 120° | 924 344 | | | | | | | | | | | | | | | | | | |
| 4,46 | 47 | 91 | 6 | 120° | 924 311 | 4,85 | 52 | 96 | 6 | 120° | 924 345 | | | | | | | | | | | | | | | | | | |
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| 4,53 | 47 | 91 | 6 | 120° | 924 317 | 4,92 | 52 | 96 | 6 | 120° | 924 351 | | | | | | | | | | | | | | | | | | |
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| 4,69 | 47 | 91 | 6 | 120° | 924 331 | 5,08 | 52 | 96 | 6 | 120° | 924 366 | | | | | | | | | | | | | | | | | | |
| 4,7 | 47 | 91 | 6 | 120° | 921 027 | 5,09 | 52 | 96 | 6 | 120° | 924 367 | | | | | | | | | | | | | | | | | | |
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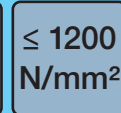
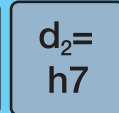
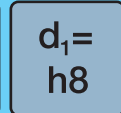
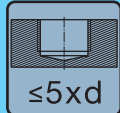


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|---|------------------------------|------------------------------|------------------------------|-----------------|---|------------------------------|------------------------------|------------------------------|------------------------------|---|-----------------|------------------------------|------------------------------|------------------------------|---|-----------------|-----------------|--|--|
| Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | | Werkstoffgruppen Groupes de matières Classification of work materials Gruppo materiali | | | | | 1.1-1.6; 2.1-2.3; 3.1-3.3; 4.1-4.5 | | | | |
| d₁ [mm] | l₂ [mm] | l₁ [mm] | d₂ [mm] | σ [°] | Code | d₁ [mm] | l₂ [mm] | l₁ [mm] | d₂ [mm] | σ [°] | Code | d₁ [mm] | l₂ [mm] | l₁ [mm] | d₂ [mm] | σ [°] | Code | | |
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| 5,14 | 52 | 96 | 6 | 120° | 924 371 | 5,53 | 57 | 101 | 6 | 120° | 924 406 | 5,14 | 52 | 96 | 6 | 120° | 924 371 | | |
| 5,15 | 52 | 96 | 6 | 120° | 924 372 | 5,54 | 57 | 101 | 6 | 120° | 924 407 | 5,15 | 52 | 96 | 6 | 120° | 924 372 | | |
| 5,16 | 52 | 96 | 6 | 120° | 924 373 | 5,55 | 57 | 101 | 6 | 120° | 921 191 | 5,16 | 52 | 96 | 6 | 120° | 924 373 | | |
| 5,17 | 52 | 96 | 6 | 120° | 924 374 | 5,56 | 57 | 101 | 6 | 120° | 924 408 | 5,17 | 52 | 96 | 6 | 120° | 924 374 | | |
| 5,18 | 52 | 96 | 6 | 120° | 924 375 | 5,57 | 57 | 101 | 6 | 120° | 924 409 | 5,18 | 52 | 96 | 6 | 120° | 924 375 | | |
| 5,19 | 52 | 96 | 6 | 120° | 924 376 | 5,58 | 57 | 101 | 6 | 120° | 924 410 | 5,19 | 52 | 96 | 6 | 120° | 924 376 | | |
| 5,2 | 52 | 96 | 6 | 120° | 921 032 | 5,59 | 57 | 101 | 6 | 120° | 924 411 | 5,2 | 52 | 96 | 6 | 120° | 921 032 | | |
| 5,21 | 52 | 96 | 6 | 120° | 924 377 | 5,6 | 57 | 101 | 6 | 120° | 921 036 | 5,21 | 52 | 96 | 6 | 120° | 924 377 | | |
| 5,22 | 52 | 96 | 6 | 120° | 924 378 | 5,61 | 57 | 101 | 6 | 120° | 924 412 | 5,22 | 52 | 96 | 6 | 120° | 924 378 | | |
| 5,23 | 52 | 96 | 6 | 120° | 924 379 | 5,62 | 57 | 101 | 6 | 120° | 924 413 | 5,23 | 52 | 96 | 6 | 120° | 924 379 | | |
| 5,24 | 52 | 96 | 6 | 120° | 924 380 | 5,63 | 57 | 101 | 6 | 120° | 924 414 | 5,24 | 52 | 96 | 6 | 120° | 924 380 | | |
| 5,25 | 52 | 96 | 6 | 120° | 924 381 | 5,64 | 57 | 101 | 6 | 120° | 924 415 | 5,25 | 52 | 96 | 6 | 120° | 924 381 | | |
| 5,26 | 52 | 96 | 6 | 120° | 924 382 | 5,65 | 57 | 101 | 6 | 120° | 924 416 | 5,26 | 52 | 96 | 6 | 120° | 924 382 | | |
| 5,27 | 52 | 96 | 6 | 120° | 924 383 | 5,66 | 57 | 101 | 6 | 120° | 924 417 | 5,27 | 52 | 96 | 6 | 120° | 924 383 | | |
| 5,28 | 52 | 96 | 6 | 120° | 924 384 | 5,67 | 57 | 101 | 6 | 120° | 924 418 | 5,28 | 52 | 96 | 6 | 120° | 924 384 | | |
| 5,29 | 52 | 96 | 6 | 120° | 924 385 | 5,68 | 57 | 101 | 6 | 120° | 924 419 | 5,29 | 52 | 96 | 6 | 120° | 924 385 | | |
| 5,3 | 52 | 96 | 6 | 120° | 921 033 | 5,69 | 57 | 101 | 6 | 120° | 924 420 | 5,3 | 52 | 96 | 6 | 120° | 921 033 | | |
| 5,31 | 57 | 101 | 6 | 120° | 924 386 | 5,7 | 57 | 101 | 6 | 120° | 921 037 | 5,31 | 57 | 101 | 6 | 120° | 924 386 | | |
| 5,32 | 57 | 101 | 6 | 120° | 924 387 | 5,71 | 57 | 101 | 6 | 120° | 924 421 | 5,32 | 57 | 101 | 6 | 120° | 924 387 | | |
| 5,33 | 57 | 101 | 6 | 120° | 924 388 | 5,72 | 57 | 101 | 6 | 120° | 924 422 | 5,33 | 57 | 101 | 6 | 120° | 924 388 | | |
| 5,34 | 57 | 101 | 6 | 120° | 924 389 | 5,73 | 57 | 101 | 6 | 120° | 924 423 | 5,34 | 57 | 101 | 6 | 120° | 924 389 | | |
| 5,35 | 57 | 101 | 6 | 120° | 924 390 | 5,74 | 57 | 101 | 6 | 120° | 924 424 | 5,35 | 57 | 101 | 6 | 120° | 924 390 | | |
| 5,36 | 57 | 101 | 6 | 120° | 924 391 | 5,75 | 57 | 101 | 6 | 120° | 924 425 | 5,36 | 57 | 101 | 6 | 120° | 924 391 | | |
| 5,37 | 57 | 101 | 6 | 120° | 924 392 | 5,76 | 57 | 101 | 6 | 120° | 924 426 | 5,37 | 57 | 101 | 6 | 120° | 924 392 | | |
| 5,38 | 57 | 101 | 6 | 120° | 924 393 | 5,77 | 57 | 101 | 6 | 120° | 924 427 | 5,38 | 57 | 101 | 6 | 120° | 924 393 | | |
| 5,39 | 57 | 101 | 6 | 120° | 924 394 | 5,78 | 57 | 101 | 6 | 120° | 924 428 | 5,39 | 57 | 101 | 6 | 120° | 924 394 | | |
| 5,4 | 57 | 101 | 6 | 120° | 921 034 | 5,79 | 57 | 101 | 6 | 120° | 924 429 | 5,4 | 57 | 101 | 6 | 120° | 921 034 | | |
| 5,41 | 57 | 101 | 6 | 120° | 924 395 | 5,8 | 57 | 101 | 6 | 120° | 921 038 | 5,41 | 57 | 101 | 6 | 120° | 924 395 | | |
| 5,42 | 57 | 101 | 6 | 120° | 924 396 | 5,81 | 57 | 101 | 6 | 120° | 924 430 | 5,42 | 57 | 101 | 6 | 120° | 924 396 | | |
| 5,43 | 57 | 101 | 6 | 120° | 924 397 | 5,82 | 57 | 101 | 6 | 120° | 924 431 | 5,43 | 57 | 101 | 6 | 120° | 924 397 | | |
| 5,44 | 57 | 101 | 6 | 120° | 924 398 | 5,83 | 57 | 101 | 6 | 120° | 924 432 | 5,44 | 57 | 101 | 6 | 120° | 924 398 | | |
| 5,45 | 57 | 101 | 6 | 120° | 924 399 | 5,84 | 57 | 101 | 6 | 120° | 924 433 | 5,45 | 57 | 101 | 6 | 120° | 924 399 | | |
| 5,46 | 57 | 101 | 6 | 120° | 924 400 | 5,85 | 57 | 101 | 6 | 120° | 924 434 | 5,46 | 57 | 101 | 6 | 120° | 924 400 | | |
| 5,47 | 57 | 101 | 6 | 120° | 924 401 | 5,86 | 57 | 101 | 6 | 120° | 924 435 | 5,47 | 57 | 101 | 6 | 120° | 924 401 | | |
| 5,48 | 57 | 101 | 6 | 120° | 924 402 | 5,87 | 57 | 101 | 6 | 120° | 924 436 | 5,48 | 57 | 101 | 6 | 120° | 924 402 | | |
| 5,49 | 57 | 101 | 6 | 120° | 924 403 | 5,88 | 57 | 101 | 6 | 120° | 924 437 | 5,49 | 57 | 101 | 6 | 120° | 924 403 | | |
| 5,5 | 57 | 101 | 6 | 120° | 921 035 | 5,89 | 57 | 101 | 6 | 120° | 924 438 | 5,5 | 57 | 101 | 6 | 120° | 921 035 | | |

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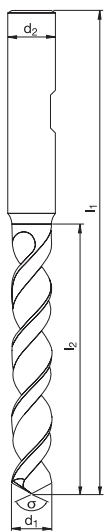
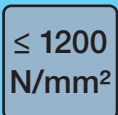
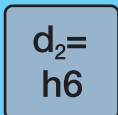
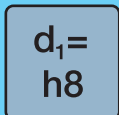
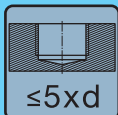
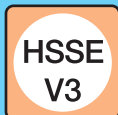




halbfett = Semistandard
semi-bold = Semistandard
demi-gras = Semistandard
in chiaro = Semistandard

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| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | | | | | | | | | | |
|---|--|--|--|--|---|--|--|--|--|---|--|--|--|--|---|--|--|--|--|-----------------|--|--|--|--|---------|--|--|--|--|
| Werkstoffgruppen Groupes de matières | | | | | Werkstoffgruppen Groupes de matières | | | | | Werkstoffgruppen Groupes de matières | | | | | Werkstoffgruppen Groupes de matières | | | | | | | | | | | | | | |
| Classification of work materials Gruppo materiali | | | | | Classification of work materials Gruppo materiali | | | | | Classification of work materials Gruppo materiali | | | | | Classification of work materials Gruppo materiali | | | | | | | | | | | | | | |
| d₁ [mm] | | | | | l₂ [mm] | | | | | l₁ [mm] | | | | | d₂ [mm] | | | | | σ [°] | | | | | | | | | |
| Code | | | | | Code | | | | | Code | | | | | Code | | | | | | | | | | | | | | |
| 5,9 | | | | | 57 | | | | | 101 | | | | | 6 | | | | | 120° | | | | | 921 039 | | | | |
| 5,91 | | | | | 57 | | | | | 101 | | | | | 6 | | | | | 120° | | | | | 924 439 | | | | |
| 5,92 | | | | | 57 | | | | | 101 | | | | | 6 | | | | | 120° | | | | | 924 440 | | | | |
| 5,93 | | | | | 57 | | | | | 101 | | | | | 6 | | | | | 120° | | | | | 924 441 | | | | |
| 5,94 | | | | | 57 | | | | | 101 | | | | | 6 | | | | | 120° | | | | | 924 442 | | | | |
| 5,95 | | | | | 57 | | | | | 101 | | | | | 6 | | | | | 120° | | | | | 924 443 | | | | |
| 5,96 | | | | | 57 | | | | | 101 | | | | | 6 | | | | | 120° | | | | | 924 444 | | | | |
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| 6 | | | | | 57 | | | | | 101 | | | | | 6 | | | | | 120° | | | | | 921 040 | | | | |
| 6,1 | | | | | 63 | | | | | 107 | | | | | 8 | | | | | 120° | | | | | 921 041 | | | | |
| 6,2 | | | | | 63 | | | | | 107 | | | | | 8 | | | | | 120° | | | | | 921 042 | | | | |
| 6,3 | | | | | 63 | | | | | 107 | | | | | 8 | | | | | 120° | | | | | 921 043 | | | | |
| 6,4 | | | | | 63 | | | | | 107 | | | | | 8 | | | | | 120° | | | | | 921 044 | | | | |
| 6,5 | | | | | 63 | | | | | 107 | | | | | 8 | | | | | 120° | | | | | 921 045 | | | | |
| 6,6 | | | | | 63 | | | | | 107 | | | | | 8 | | | | | 120° | | | | | 921 046 | | | | |
| 6,7 | | | | | 63 | | | | | 107 | | | | | 8 | | | | | 120° | | | | | 921 047 | | | | |
| 6,8 | | | | | 69 | | | | | 113 | | | | | 8 | | | | | 120° | | | | | 921 048 | | | | |
| 6,9 | | | | | 69 | | | | | 113 | | | | | 8 | | | | | 120° | | | | | 921 049 | | | | |
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| 7,4 | | | | | 69 | | | | | 113 | | | | | 8 | | | | | 120° | | | | | 921 054 | | | | |
| 7,5 | | | | | 69 | | | | | 113 | | | | | 8 | | | | | 120° | | | | | 921 055 | | | | |
| 7,55 | | | | | 75 | | | | | 119 | | | | | 8 | | | | | 120° | | | | | 921 192 | | | | |
| 7,6 | | | | | 75 | | | | | 119 | | | | | 8 | | | | | 120° | | | | | 921 056 | | | | |
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| 8,1 | | | | | 75 | | | | | 125 | | | | | 10 | | | | | 120° | | | | | 921 061 | | | | |
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| 8,4 | | | | | 75 | | | | | 125 | | | | | 10 | | | | | 120° | | | | | 921 064 | | | | |
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| 8,7 | | | | | 81 | | | | | 131 | | | | | 10 | | | | | 120° | | | | | 921 067 | | | | |



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Katalog-Nr. ^{W%} Catalogue no. ^{W%} **529 100**⁶²⁰
 Catalogue n° ^{W%} Nr. di catalogo ^{W%} **TiN**

Werkstoffgruppen Classification of work materials 1.1–1.6; 2.1–2.3;
 Groupes de matières Gruppo materiali 3.1–3.3; 4.1–4.5

| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
|------------------------|------------------------|------------------------|------------------------|----------|----------|
| 12,1 | 101 | 161 | 16 | 120° | 921 201 |
| 12,2 | 101 | 161 | 16 | 120° | 921 202 |
| 12,3 | 101 | 161 | 16 | 120° | 921 203 |
| 12,4 | 101 | 161 | 16 | 120° | 921 204 |
| 12,5 | 101 | 161 | 16 | 120° | 921 205 |
| 12,6 | 101 | 161 | 16 | 120° | 921 206 |
| 12,7 | 101 | 161 | 16 | 120° | 921 207 |
| 12,8 | 101 | 161 | 16 | 120° | 921 208 |
| 12,9 | 101 | 161 | 16 | 120° | 921 209 |
| 13 | 101 | 161 | 16 | 120° | 921 210 |
| 13,5 | 106 | 166 | 16 | 120° | 921 215 |
| 14 | 106 | 166 | 16 | 120° | 921 220 |
| 14,5 | 109 | 169 | 16 | 120° | 921 225 |
| 15 | 109 | 169 | 16 | 120° | 921 230 |
| 15,5 | 112 | 172 | 16 | 120° | 921 235 |
| 16 | 112 | 172 | 16 | 120° | 921 240 |
| 16,5 | 115 | 181 | 20 | 120° | 921 245 |
| 17 | 115 | 181 | 20 | 120° | 921 250 |
| 17,5 | 118 | 184 | 20 | 120° | 921 255 |
| 18 | 118 | 184 | 20 | 120° | 921 260 |
| 18,5 | 122 | 188 | 20 | 120° | 921 265 |
| 19 | 122 | 188 | 20 | 120° | 921 270 |
| 19,5 | 125 | 191 | 20 | 120° | 921 275 |
| 20 | 125 | 191 | 20 | 120° | 921 280 |



**HSS-Co Tieflochbohrer / HSS-Co deep hole drills /
HSS-Co forets perçage profond /
HSS-Co punte foratura profunda**



Eine neu entwickelte Ausspitzung in Verbindung mit einer weiterentwickelten TiAlN-Beschichtung sowie flache Nutenformen sind Wiedererkennungsmerkmale des HSS-Co Tieflochbohrers.

Die Kombination dieser drei Merkmale reduzieren signifikant das Drehmoment sowie die Axialkraft und die Reibung. Durch diese Eigenschaften ist ein Bohren von bis zu 20xD ohne Entspänen möglich.

A new developed thinning form in connection with a modified TiAlN-Coating and wide flutes are the characteristics of the HSS-Co deep hole drill.

The combination of these three specifications reduce the torque, friction and the axial-strength significant. These benefits enable a drilling up to 20xD without steps.

Le foret HSS-Co pour trous profonds est reconnaissable à un nouvel appointissage combiné à un revêtement TiAlN perfectionné ainsi qu'à des formes plates de goujures.

La combinaison de ces trois caractéristiques réduit significativement le couple ainsi que la force axiale et le frottement. Ces propriétés permettent de procéder à un perçage allant jusqu'à 20xD sans dégageement des copeaux.

Un nuovo tagliente della punta e un rivestimento TiAlN di nuova generazione, oltre alle forme piatte delle scanalature, sono le caratteristiche distintive delle punte per fori profondi HSS-Co.

L'abbinamento di queste tre caratteristiche riduce in modo significativo il momento torcente, la forza assiale e l'attrito. Grazie a queste caratteristiche è possibile effettuare una foratura fino a 20 volte il diametro senza asportazione di truciolo.



Abmessungsbereich • Size Range •

Plage de dimension • Gamma misure

Ø 1,6–12,0 mm

Ausgelegte Beschichtung für einen niedrigen Reibungskoeffizient •

A special developed coating for a small friction coefficient •

Revêtement conçu pour un coefficient bas de frottement •

Rivestimento realizzato per ottenere un basso coefficiente di attrito

TiAlN

Bohren ohne zu entspänen bis • Non-step drilling up to •

Perçage sans dégageement de copeaux jusqu'à •

Foratura senza interruzioni fino a

≤ 20 x D

Bohren bis • Drilling up to •

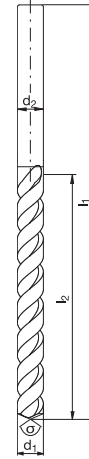
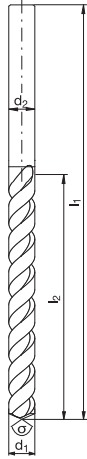
Perçage jusqu'à • Foratura die materiali con durezza

~ 30 HRC

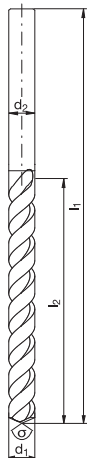
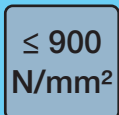
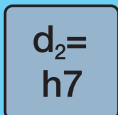
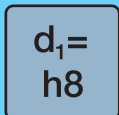
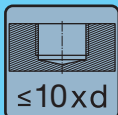




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| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 528 010 ⁶²⁰ | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 528 010 ⁶²⁰ | | | | | |
|--|------------------------|--|------------------------|--|----------|--|------------------------|------------------------|------------------------|----------|----------|
| Catalogue n ^o W% | | TiAIN | | Catalogue n ^o W% | | TiAIN | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | |
| | | 1.1-1.3; 1.5; 2.1-2.3 | | | | 1.1-1.3; 1.5; 2.1-2.3 | | | | | |
| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
| 1,6 | 26 | 75 | 1,6 | 120° | 926 416 | 5,7 | 78 | 128 | 5,7 | 120° | 926 457 |
| 1,8 | 26 | 75 | 1,8 | 120° | 926 418 | 5,8 | 78 | 128 | 5,8 | 120° | 926 458 |
| 2 | 26 | 75 | 2 | 120° | 926 420 | 5,9 | 78 | 128 | 5,9 | 120° | 926 459 |
| 2,1 | 33 | 75 | 2,1 | 120° | 926 421 | 6 | 78 | 128 | 6 | 120° | 926 460 |
| 2,2 | 33 | 75 | 2,2 | 120° | 926 422 | 6,1 | 78 | 140 | 6,1 | 120° | 926 461 |
| 2,3 | 33 | 75 | 2,3 | 120° | 926 423 | 6,2 | 87 | 140 | 6,2 | 120° | 926 462 |
| 2,4 | 33 | 75 | 2,4 | 120° | 926 424 | 6,3 | 87 | 140 | 6,3 | 120° | 926 463 |
| 2,5 | 33 | 75 | 2,5 | 120° | 926 425 | 6,4 | 87 | 140 | 6,4 | 120° | 926 464 |
| 2,6 | 40 | 90 | 2,6 | 120° | 926 426 | 6,5 | 87 | 140 | 6,5 | 120° | 926 465 |
| 2,7 | 40 | 90 | 2,7 | 120° | 926 427 | 6,6 | 87 | 140 | 6,6 | 120° | 926 466 |
| 2,8 | 40 | 90 | 2,8 | 120° | 926 428 | 6,7 | 87 | 140 | 6,7 | 120° | 926 467 |
| 2,9 | 40 | 90 | 2,9 | 120° | 926 429 | 6,8 | 90 | 140 | 6,8 | 120° | 926 468 |
| 3 | 40 | 90 | 3 | 120° | 926 430 | 6,9 | 90 | 140 | 6,9 | 120° | 926 469 |
| 3,1 | 45 | 100 | 3,1 | 120° | 926 431 | 7 | 90 | 140 | 7 | 120° | 926 470 |
| 3,2 | 45 | 100 | 3,2 | 120° | 926 432 | 7,1 | 100 | 155 | 7,1 | 120° | 926 471 |
| 3,3 | 45 | 100 | 3,3 | 120° | 926 433 | 7,2 | 100 | 155 | 7,2 | 120° | 926 472 |
| 3,4 | 50 | 100 | 3,4 | 120° | 926 434 | 7,3 | 100 | 155 | 7,3 | 120° | 926 473 |
| 3,5 | 50 | 100 | 3,5 | 120° | 926 435 | 7,4 | 100 | 155 | 7,4 | 120° | 926 474 |
| 3,6 | 50 | 100 | 3,6 | 120° | 926 436 | 7,5 | 100 | 155 | 7,5 | 120° | 926 475 |
| 3,7 | 50 | 100 | 3,7 | 120° | 926 437 | 7,6 | 105 | 155 | 7,6 | 120° | 926 476 |
| 3,8 | 50 | 100 | 3,8 | 120° | 926 438 | 7,7 | 105 | 155 | 7,7 | 120° | 926 477 |
| 3,9 | 50 | 100 | 3,9 | 120° | 926 439 | 7,8 | 105 | 155 | 7,8 | 120° | 926 478 |
| 4 | 50 | 100 | 4 | 120° | 926 440 | 7,9 | 105 | 155 | 7,9 | 120° | 926 479 |
| 4,1 | 55 | 115 | 4,1 | 120° | 926 441 | 8 | 105 | 155 | 8 | 120° | 926 480 |
| 4,2 | 55 | 115 | 4,2 | 120° | 926 442 | 8,1 | 110 | 165 | 8,1 | 120° | 926 481 |
| 4,3 | 60 | 115 | 4,3 | 120° | 926 443 | 8,2 | 110 | 165 | 8,2 | 120° | 926 482 |
| 4,4 | 60 | 115 | 4,4 | 120° | 926 444 | 8,3 | 110 | 165 | 8,3 | 120° | 926 483 |
| 4,5 | 60 | 115 | 4,5 | 120° | 926 445 | 8,4 | 110 | 165 | 8,4 | 120° | 926 484 |
| 4,6 | 60 | 115 | 4,6 | 120° | 926 446 | 8,5 | 110 | 165 | 8,5 | 120° | 926 485 |
| 4,7 | 60 | 115 | 4,7 | 120° | 926 447 | 8,6 | 115 | 165 | 8,6 | 120° | 926 486 |
| 4,8 | 65 | 115 | 4,8 | 120° | 926 448 | 8,7 | 115 | 165 | 8,7 | 120° | 926 487 |
| 4,9 | 65 | 115 | 4,9 | 120° | 926 449 | 8,8 | 115 | 165 | 8,8 | 120° | 926 488 |
| 5 | 65 | 115 | 5 | 120° | 926 450 | 8,9 | 115 | 165 | 8,9 | 120° | 926 489 |
| 5,1 | 70 | 128 | 5,1 | 120° | 926 451 | 9 | 115 | 165 | 9 | 120° | 926 490 |
| 5,2 | 70 | 128 | 5,2 | 120° | 926 452 | 9,1 | 125 | 190 | 9,1 | 120° | 926 491 |
| 5,3 | 70 | 128 | 5,3 | 120° | 926 453 | 9,2 | 125 | 190 | 9,2 | 120° | 926 492 |
| 5,4 | 78 | 128 | 5,4 | 120° | 926 454 | 9,3 | 125 | 190 | 9,3 | 120° | 926 493 |
| 5,5 | 78 | 128 | 5,5 | 120° | 926 455 | 9,4 | 125 | 190 | 9,4 | 120° | 926 494 |
| 5,6 | 78 | 128 | 5,6 | 120° | 926 456 | 9,5 | 125 | 190 | 9,5 | 120° | 926 495 |



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Katalog-Nr. ^{W%} **Catalogue no.** ^{W%} **528 010** ⁶²⁰
Catalogue n° ^{W%} **Nr. di catalogo** ^{W%} **TiAIN**

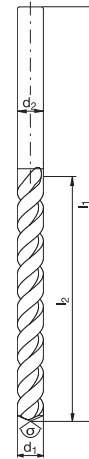
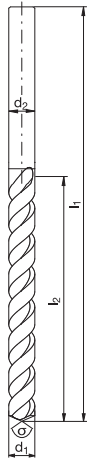
Werkstoffgruppen **Classification of work materials** 1.1-1.3; 1.5;
Groupes de matières **Gruppo materiali** 2.1-2.3

| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
|------------------------|------------------------|------------------------|------------------------|----------|----------|
| 9,6 | 130 | 190 | 9,6 | 120° | 926 496 |
| 9,7 | 130 | 190 | 9,7 | 120° | 926 497 |
| 9,8 | 130 | 190 | 9,8 | 120° | 926 498 |
| 9,9 | 130 | 190 | 9,9 | 120° | 926 499 |
| 10 | 130 | 190 | 10 | 120° | 926 500 |
| 10,1 | 140 | 205 | 10,1 | 120° | 926 501 |
| 10,2 | 140 | 205 | 10,2 | 120° | 926 502 |
| 10,3 | 140 | 205 | 10,3 | 120° | 926 503 |
| 10,4 | 140 | 205 | 10,4 | 120° | 926 504 |
| 10,5 | 140 | 205 | 10,5 | 120° | 926 505 |
| 10,6 | 145 | 205 | 10,6 | 120° | 926 506 |
| 10,7 | 145 | 205 | 10,7 | 120° | 926 507 |
| 10,8 | 145 | 205 | 10,8 | 120° | 926 508 |
| 10,9 | 145 | 205 | 10,9 | 120° | 926 509 |
| 11 | 145 | 205 | 11 | 120° | 926 510 |
| 11,1 | 155 | 215 | 11,1 | 120° | 926 511 |
| 11,2 | 155 | 215 | 11,2 | 120° | 926 512 |
| 11,3 | 155 | 215 | 11,3 | 120° | 926 513 |
| 11,4 | 155 | 215 | 11,4 | 120° | 926 514 |
| 11,5 | 155 | 215 | 11,5 | 120° | 926 515 |
| 11,6 | 155 | 215 | 11,6 | 120° | 926 516 |
| 11,7 | 155 | 215 | 11,7 | 120° | 926 517 |
| 11,8 | 155 | 215 | 11,8 | 120° | 926 518 |
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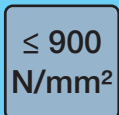
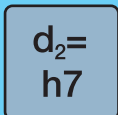
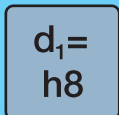
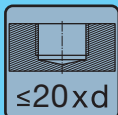


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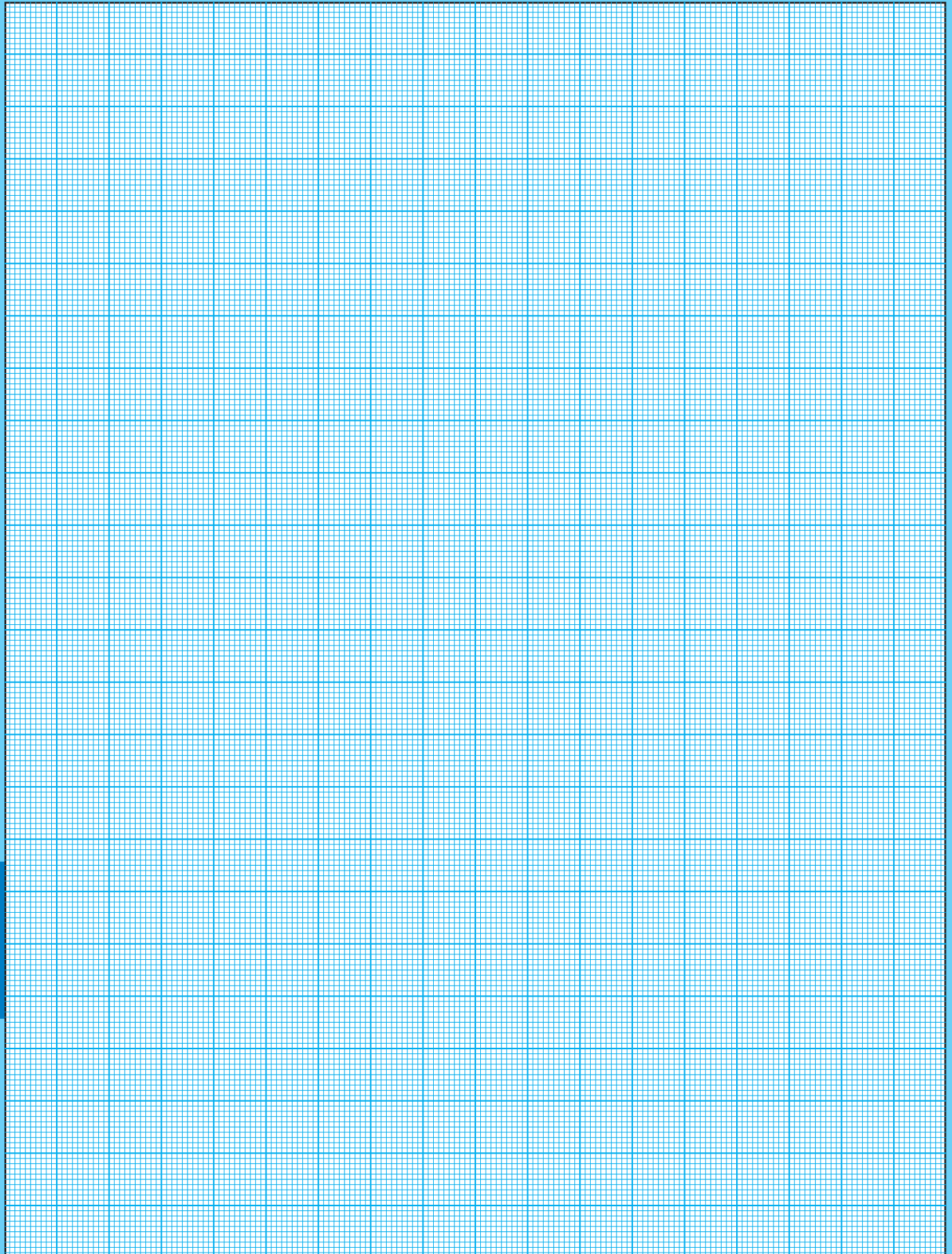
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|--|------------------------|--|------------------------|--------------------------|----------|--|------------------------|--|------------------------|--------------------------|----------|
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1.1-1.3; 1.5; 2.1-2.3 | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1.1-1.3; 1.5; 2.1-2.3 | |
| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
| 1,6 | 30 | 70 | 1,6 | 120° | 926 616 | 5,7 | 104 | 165 | 5,7 | 120° | 926 657 |
| 1,8 | 34 | 75 | 1,8 | 120° | 926 618 | 5,8 | 106 | 165 | 5,8 | 120° | 926 658 |
| 2 | 36 | 80 | 2 | 120° | 926 620 | 6 | 108 | 170 | 6 | 120° | 926 660 |
| 2,1 | 38 | 80 | 2,1 | 120° | 926 621 | 6,2 | 112 | 170 | 6,2 | 120° | 926 662 |
| 2,2 | 40 | 80 | 2,2 | 120° | 926 622 | 6,3 | 114 | 175 | 6,3 | 120° | 926 663 |
| 2,3 | 42 | 85 | 2,3 | 120° | 926 623 | 6,5 | 118 | 200 | 6,5 | 120° | 926 665 |
| 2,4 | 44 | 85 | 2,4 | 120° | 926 624 | 6,6 | 120 | 200 | 6,6 | 120° | 926 666 |
| 2,5 | 46 | 85 | 2,5 | 120° | 926 625 | 6,8 | 124 | 200 | 6,8 | 120° | 926 668 |
| 2,6 | 48 | 100 | 2,6 | 120° | 926 626 | 6,9 | 126 | 200 | 6,9 | 120° | 926 669 |
| 2,7 | 50 | 100 | 2,7 | 120° | 926 627 | 7 | 126 | 200 | 7 | 120° | 926 670 |
| 2,8 | 50 | 100 | 2,8 | 120° | 926 628 | 7,1 | 128 | 200 | 7,1 | 120° | 926 671 |
| 2,9 | 54 | 105 | 2,9 | 120° | 926 629 | 7,5 | 136 | 205 | 7,5 | 120° | 926 675 |
| 3 | 54 | 105 | 3 | 120° | 926 630 | 8 | 144 | 215 | 8 | 120° | 926 680 |
| 3,1 | 56 | 110 | 3,1 | 120° | 926 631 | 8,1 | 146 | 215 | 8,1 | 120° | 926 681 |
| 3,2 | 58 | 110 | 3,2 | 120° | 926 632 | 8,2 | 148 | 220 | 8,2 | 120° | 926 682 |
| 3,3 | 60 | 110 | 3,3 | 120° | 926 633 | 8,5 | 154 | 225 | 8,5 | 120° | 926 685 |
| 3,4 | 62 | 115 | 3,4 | 120° | 926 634 | 8,6 | 156 | 225 | 8,6 | 120° | 926 686 |
| 3,5 | 64 | 115 | 3,5 | 120° | 926 635 | 8,8 | 160 | 230 | 8,8 | 120° | 926 688 |
| 3,6 | 66 | 115 | 3,6 | 120° | 926 636 | 9 | 162 | 230 | 9 | 120° | 926 690 |
| 3,7 | 68 | 120 | 3,7 | 120° | 926 637 | 9,3 | 168 | 240 | 9,3 | 120° | 926 693 |
| 3,8 | 70 | 120 | 3,8 | 120° | 926 638 | 9,5 | 172 | 240 | 9,5 | 120° | 926 695 |
| 3,9 | 70 | 120 | 3,9 | 120° | 926 639 | 9,7 | 176 | 245 | 9,7 | 120° | 926 697 |
| 4 | 72 | 120 | 4 | 120° | 926 640 | 9,8 | 178 | 245 | 9,8 | 120° | 926 698 |
| 4,1 | 74 | 135 | 4,1 | 120° | 926 641 | 10 | 180 | 250 | 10 | 120° | 926 700 |
| 4,2 | 76 | 135 | 4,2 | 120° | 926 642 | 10,5 | 190 | 270 | 10,5 | 120° | 926 705 |
| 4,3 | 78 | 140 | 4,3 | 120° | 926 643 | 11 | 200 | 280 | 11 | 120° | 926 710 |
| 4,4 | 80 | 140 | 4,4 | 120° | 926 644 | 11,5 | 208 | 290 | 11,5 | 120° | 926 715 |
| 4,5 | 82 | 140 | 4,5 | 120° | 926 645 | 11,8 | 214 | 295 | 11,8 | 120° | 926 718 |
| 4,6 | 84 | 145 | 4,6 | 120° | 926 646 | 12 | 216 | 300 | 12 | 120° | 926 720 |
| 4,7 | 86 | 145 | 4,7 | 120° | 926 647 | | | | | | |
| 4,8 | 86 | 145 | 4,8 | 120° | 926 648 | | | | | | |
| 4,9 | 88 | 150 | 4,9 | 120° | 926 649 | | | | | | |
| 5 | 90 | 150 | 5 | 120° | 926 650 | | | | | | |
| 5,1 | 92 | 150 | 5,1 | 120° | 926 651 | | | | | | |
| 5,2 | 94 | 155 | 5,2 | 120° | 926 652 | | | | | | |
| 5,3 | 96 | 155 | 5,3 | 120° | 926 653 | | | | | | |
| 5,4 | 98 | 155 | 5,4 | 120° | 926 654 | | | | | | |
| 5,5 | 100 | 155 | 5,5 | 120° | 926 655 | | | | | | |
| 5,6 | 102 | 160 | 5,6 | 120° | 926 656 | | | | | | |

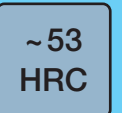
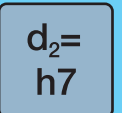
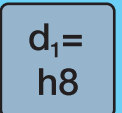
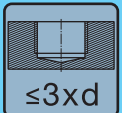
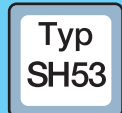




| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | 528 020 ⁶²⁰ TiAIN | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | 528 020 ⁶²⁰ TiAIN | | | | |
|--|------------------------------|--|------------------------------|-----------------|---|------------|------------|-----|-----|--|------------------------------|--|------------------------------|-----------------|---|--|--|--|--|
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1.1-1.3; 1.5; 2.1-2.3 | | | | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1.1-1.3; 1.5; 2.1-2.3 | | | | |
| d₁ [mm] | l₂ [mm] | l₁ [mm] | d₂ [mm] | σ [°] | Code | | | | | d₁ [mm] | l₂ [mm] | l₁ [mm] | d₂ [mm] | σ [°] | Code | | | | |
| 1,6 | 38 | 85 | 1,6 | 120° | 926 816 | 7,5 | 174 | 245 | 7,5 | 120° | 926 875 | | | | | | | | |
| 1,8 | 42 | 85 | 1,8 | 120° | 926 818 | 8 | 184 | 255 | 8 | 120° | 926 880 | | | | | | | | |
| 2 | 46 | 85 | 2 | 120° | 926 820 | 8,1 | 188 | 255 | 8,1 | 120° | 926 881 | | | | | | | | |
| 2,1 | 50 | 90 | 2,1 | 120° | 926 821 | 8,2 | 190 | 260 | 8,2 | 120° | 926 882 | | | | | | | | |
| 2,2 | 52 | 90 | 2,2 | 120° | 926 822 | 8,5 | 196 | 265 | 8,5 | 120° | 926 885 | | | | | | | | |
| 2,3 | 54 | 95 | 2,3 | 120° | 926 823 | 9 | 208 | 275 | 9 | 120° | 926 890 | | | | | | | | |
| 2,4 | 56 | 95 | 2,4 | 120° | 926 824 | 10 | 230 | 300 | 10 | 120° | 926 900 | | | | | | | | |
| 2,5 | 58 | 100 | 2,5 | 120° | 926 825 | 11 | 254 | 350 | 11 | 120° | 926 910 | | | | | | | | |
| 2,6 | 60 | 110 | 2,6 | 120° | 926 826 | 12 | 276 | 350 | 12 | 120° | 926 920 | | | | | | | | |
| 2,7 | 64 | 115 | 2,7 | 120° | 926 827 | | | | | | | | | | | | | | |
| 2,8 | 66 | 115 | 2,8 | 120° | 926 828 | | | | | | | | | | | | | | |
| 2,9 | 68 | 120 | 2,9 | 120° | 926 829 | | | | | | | | | | | | | | |
| 3 | 70 | 120 | 3 | 120° | 926 830 | | | | | | | | | | | | | | |
| 3,1 | 72 | 125 | 3,1 | 120° | 926 831 | | | | | | | | | | | | | | |
| 3,2 | 74 | 125 | 3,2 | 120° | 926 832 | | | | | | | | | | | | | | |
| 3,3 | 76 | 125 | 3,4 | 120° | 926 833 | | | | | | | | | | | | | | |
| 3,4 | 80 | 130 | 3,4 | 120° | 926 834 | | | | | | | | | | | | | | |
| 3,5 | 82 | 130 | 3,5 | 120° | 926 835 | | | | | | | | | | | | | | |
| 3,7 | 86 | 135 | 3,7 | 120° | 926 837 | | | | | | | | | | | | | | |
| 3,8 | 88 | 140 | 3,8 | 120° | 926 838 | | | | | | | | | | | | | | |
| 4 | 92 | 140 | 4 | 120° | 926 840 | | | | | | | | | | | | | | |
| 4,1 | 96 | 155 | 4,1 | 120° | 926 841 | | | | | | | | | | | | | | |
| 4,2 | 98 | 155 | 4,2 | 120° | 926 842 | | | | | | | | | | | | | | |
| 4,3 | 100 | 160 | 4,3 | 120° | 926 843 | | | | | | | | | | | | | | |
| 4,5 | 104 | 165 | 4,5 | 120° | 926 845 | | | | | | | | | | | | | | |
| 4,6 | 106 | 165 | 4,6 | 120° | 926 846 | | | | | | | | | | | | | | |
| 4,8 | 112 | 170 | 4,8 | 120° | 926 848 | | | | | | | | | | | | | | |
| 5 | 116 | 175 | 5 | 120° | 926 850 | | | | | | | | | | | | | | |
| 5,1 | 118 | 180 | 5,1 | 120° | 926 851 | | | | | | | | | | | | | | |
| 5,2 | 120 | 180 | 5,2 | 120° | 926 852 | | | | | | | | | | | | | | |
| 5,5 | 128 | 185 | 5,5 | 120° | 926 855 | | | | | | | | | | | | | | |
| 5,7 | 132 | 190 | 5,7 | 120° | 926 857 | | | | | | | | | | | | | | |
| 5,8 | 134 | 200 | 5,8 | 120° | 926 858 | | | | | | | | | | | | | | |
| 6 | 138 | 200 | 6 | 120° | 926 860 | | | | | | | | | | | | | | |
| 6,3 | 146 | 200 | 6,3 | 120° | 926 863 | | | | | | | | | | | | | | |
| 6,5 | 150 | 225 | 6,5 | 120° | 926 865 | | | | | | | | | | | | | | |
| 6,8 | 158 | 225 | 6,8 | 120° | 926 868 | | | | | | | | | | | | | | |
| 6,9 | 160 | 230 | 6,9 | 120° | 926 869 | | | | | | | | | | | | | | |
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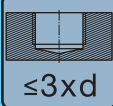




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| d₁ [mm] | l₂ [mm] | l₁ [mm] | d₂ [mm] | σ [°] | Code | | | | | d₁ [mm] | l₂ [mm] | l₁ [mm] | d₂ [mm] | σ [°] | Code | | | | | | | | | | | | | | |
| 0,5 | 3 | 38 | 3 | 130° | 925 170 | | | | | 4,4 | 24 | 68 | 6 | 130° | 925 024 | | | | | | | | | | | | | | |
| 0,6 | 4 | 38 | 3 | 130° | 925 171 | | | | | 4,5 | 24 | 68 | 6 | 130° | 925 025 | | | | | | | | | | | | | | |
| 0,7 | 5 | 38 | 3 | 130° | 925 172 | | | | | 4,6 | 24 | 68 | 6 | 130° | 925 026 | | | | | | | | | | | | | | |
| 0,8 | 5 | 38 | 3 | 130° | 925 173 | | | | | 4,7 | 24 | 68 | 6 | 130° | 925 027 | | | | | | | | | | | | | | |
| 0,9 | 6 | 38 | 3 | 130° | 925 174 | | | | | 4,8 | 26 | 70 | 6 | 130° | 925 028 | | | | | | | | | | | | | | |
| 1 | 6 | 38 | 3 | 130° | 925 175 | | | | | 4,9 | 26 | 70 | 6 | 130° | 925 029 | | | | | | | | | | | | | | |
| 1,1 | 7 | 39 | 3 | 130° | 925 176 | | | | | 5 | 26 | 70 | 6 | 130° | 925 030 | | | | | | | | | | | | | | |
| 1,2 | 8 | 40 | 3 | 130° | 925 177 | | | | | 5,1 | 26 | 70 | 6 | 130° | 925 031 | | | | | | | | | | | | | | |
| 1,3 | 8 | 40 | 3 | 130° | 925 180 | | | | | 5,2 | 26 | 70 | 6 | 130° | 925 032 | | | | | | | | | | | | | | |
| 1,4 | 9 | 41 | 3 | 130° | 925 181 | | | | | 5,3 | 26 | 70 | 6 | 130° | 925 033 | | | | | | | | | | | | | | |
| 1,5 | 9 | 41 | 3 | 130° | 925 182 | | | | | 5,4 | 28 | 72 | 6 | 130° | 925 034 | | | | | | | | | | | | | | |
| 1,6 | 10 | 42 | 3 | 130° | 925 183 | | | | | 5,5 | 28 | 72 | 6 | 130° | 925 035 | | | | | | | | | | | | | | |
| 1,7 | 10 | 42 | 3 | 130° | 925 184 | | | | | 5,6 | 28 | 72 | 6 | 130° | 925 036 | | | | | | | | | | | | | | |
| 1,8 | 11 | 43 | 3 | 130° | 925 185 | | | | | 5,7 | 28 | 72 | 6 | 130° | 925 037 | | | | | | | | | | | | | | |
| 1,9 | 11 | 43 | 3 | 130° | 925 186 | | | | | 5,8 | 28 | 72 | 6 | 130° | 925 038 | | | | | | | | | | | | | | |
| 2 | 12 | 44 | 3 | 130° | 925 000 | | | | | 5,9 | 28 | 72 | 6 | 130° | 925 039 | | | | | | | | | | | | | | |
| 2,1 | 12 | 44 | 3 | 130° | 925 001 | | | | | 6 | 28 | 72 | 6 | 130° | 925 040 | | | | | | | | | | | | | | |
| 2,2 | 13 | 45 | 3 | 130° | 925 002 | | | | | 6,1 | 31 | 75 | 8 | 130° | 925 041 | | | | | | | | | | | | | | |
| 2,3 | 13 | 45 | 3 | 130° | 925 003 | | | | | 6,2 | 31 | 75 | 8 | 130° | 925 042 | | | | | | | | | | | | | | |
| 2,4 | 14 | 46 | 3 | 130° | 925 004 | | | | | 6,3 | 31 | 75 | 8 | 130° | 925 043 | | | | | | | | | | | | | | |
| 2,5 | 14 | 46 | 3 | 130° | 925 005 | | | | | 6,4 | 31 | 75 | 8 | 130° | 925 044 | | | | | | | | | | | | | | |
| 2,6 | 14 | 46 | 3 | 130° | 925 006 | | | | | 6,5 | 31 | 75 | 8 | 130° | 925 045 | | | | | | | | | | | | | | |
| 2,7 | 16 | 48 | 3 | 130° | 925 007 | | | | | 6,6 | 31 | 75 | 8 | 130° | 925 046 | | | | | | | | | | | | | | |
| 2,8 | 16 | 48 | 3 | 130° | 925 008 | | | | | 6,7 | 31 | 75 | 8 | 130° | 925 047 | | | | | | | | | | | | | | |
| 2,9 | 16 | 48 | 3 | 130° | 925 009 | | | | | 6,8 | 34 | 78 | 8 | 130° | 925 048 | | | | | | | | | | | | | | |
| 3 | 16 | 48 | 3 | 130° | 925 010 | | | | | 6,9 | 34 | 78 | 8 | 130° | 925 049 | | | | | | | | | | | | | | |
| 3,1 | 18 | 50 | 4 | 130° | 925 011 | | | | | 7 | 34 | 78 | 8 | 130° | 925 050 | | | | | | | | | | | | | | |
| 3,2 | 18 | 50 | 4 | 130° | 925 012 | | | | | 7,1 | 34 | 78 | 8 | 130° | 925 051 | | | | | | | | | | | | | | |
| 3,3 | 18 | 50 | 4 | 130° | 925 013 | | | | | 7,2 | 34 | 78 | 8 | 130° | 925 052 | | | | | | | | | | | | | | |
| 3,4 | 20 | 52 | 4 | 130° | 925 014 | | | | | 7,3 | 34 | 78 | 8 | 130° | 925 053 | | | | | | | | | | | | | | |
| 3,5 | 20 | 52 | 4 | 130° | 925 015 | | | | | 7,4 | 34 | 78 | 8 | 130° | 925 054 | | | | | | | | | | | | | | |
| 3,6 | 20 | 52 | 4 | 130° | 925 016 | | | | | 7,5 | 34 | 78 | 8 | 130° | 925 055 | | | | | | | | | | | | | | |
| 3,7 | 20 | 52 | 4 | 130° | 925 017 | | | | | 7,6 | 37 | 81 | 8 | 130° | 925 056 | | | | | | | | | | | | | | |
| 3,8 | 22 | 54 | 4 | 130° | 925 018 | | | | | 7,7 | 37 | 81 | 8 | 130° | 925 057 | | | | | | | | | | | | | | |
| 3,9 | 22 | 54 | 4 | 130° | 925 019 | | | | | 7,8 | 37 | 81 | 8 | 130° | 925 058 | | | | | | | | | | | | | | |
| 4 | 22 | 54 | 4 | 130° | 925 020 | | | | | 7,9 | 37 | 81 | 8 | 130° | 925 059 | | | | | | | | | | | | | | |
| 4,1 | 22 | 66 | 6 | 130° | 925 021 | | | | | 8 | 37 | 81 | 8 | 130° | 925 060 | | | | | | | | | | | | | | |
| 4,2 | 22 | 66 | 6 | 130° | 925 022 | | | | | 8,1 | 37 | 87 | 10 | 130° | 925 061 | | | | | | | | | | | | | | |
| 4,3 | 24 | 68 | 6 | 130° | 925 023 | | | | | 8,2 | 37 | 87 | 10 | 130° | 925 062 | | | | | | | | | | | | | | |

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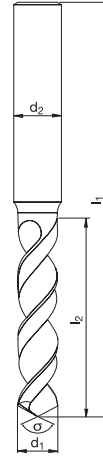
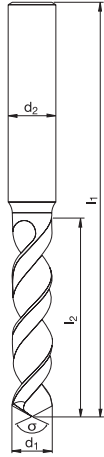


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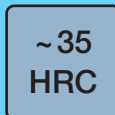
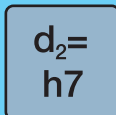
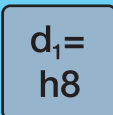
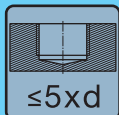
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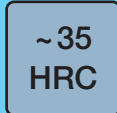
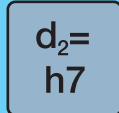
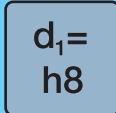
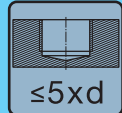


| Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 529 500 ⁶³⁰ TiCN | | Katalog-Nr. ^{W%} Catalogue n ^o ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 529 500 ⁶³⁰ TiCN | |
|---|------------------------|--|------------------------|---------------------------------------|----------|---|------------------------|--|------------------------|---------------------------------------|----------|
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| 8,3 | 37 | 87 | 10 | 130° | 925 063 | 12,2 | 51 | 108 | 12 | 130° | 925 102 |
| 8,4 | 37 | 87 | 10 | 130° | 925 064 | 12,3 | 51 | 108 | 12 | 130° | 925 103 |
| 8,5 | 37 | 87 | 10 | 130° | 925 065 | 12,4 | 51 | 108 | 12 | 130° | 925 104 |
| 8,6 | 40 | 90 | 10 | 130° | 925 066 | 12,5 | 51 | 108 | 12 | 130° | 925 105 |
| 8,7 | 40 | 90 | 10 | 130° | 925 067 | 12,6 | 51 | 108 | 12 | 130° | 925 106 |
| 8,8 | 40 | 90 | 10 | 130° | 925 068 | 12,7 | 51 | 108 | 12 | 130° | 925 107 |
| 8,9 | 40 | 90 | 10 | 130° | 925 069 | 12,8 | 51 | 108 | 12 | 130° | 925 108 |
| 9 | 40 | 90 | 10 | 130° | 925 070 | 12,9 | 51 | 108 | 12 | 130° | 925 109 |
| 9,1 | 40 | 90 | 10 | 130° | 925 071 | 13 | 51 | 108 | 12 | 130° | 925 110 |
| 9,2 | 40 | 90 | 10 | 130° | 925 072 | 14,1 | 56 | 116 | 16 | 130° | 925 121 |
| 9,3 | 40 | 90 | 10 | 130° | 925 073 | 17,7 | 62 | 128 | 20 | 130° | 925 157 |
| 9,4 | 40 | 90 | 10 | 130° | 925 074 | | | | | | |
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| 9,8 | 43 | 93 | 10 | 130° | 925 078 | | | | | | |
| 9,9 | 43 | 93 | 10 | 130° | 925 079 | | | | | | |
| 10 | 43 | 93 | 10 | 130° | 925 080 | | | | | | |
| 10,1 | 43 | 100 | 12 | 130° | 925 081 | | | | | | |
| 10,2 | 43 | 104 | 12 | 130° | 925 082 | | | | | | |
| 10,3 | 43 | 100 | 12 | 130° | 925 083 | | | | | | |
| 10,4 | 43 | 104 | 12 | 130° | 925 084 | | | | | | |
| 10,5 | 43 | 104 | 12 | 130° | 925 085 | | | | | | |
| 10,6 | 43 | 100 | 12 | 130° | 925 086 | | | | | | |
| 10,7 | 47 | 104 | 12 | 130° | 925 087 | | | | | | |
| 10,8 | 47 | 104 | 12 | 130° | 925 088 | | | | | | |
| 10,9 | 47 | 104 | 12 | 130° | 925 089 | | | | | | |
| 11 | 47 | 104 | 12 | 130° | 925 090 | | | | | | |
| 11,1 | 47 | 104 | 12 | 130° | 925 091 | | | | | | |
| 11,2 | 47 | 104 | 12 | 130° | 925 092 | | | | | | |
| 11,3 | 47 | 104 | 12 | 130° | 925 093 | | | | | | |
| 11,4 | 47 | 104 | 12 | 130° | 925 094 | | | | | | |
| 11,5 | 47 | 104 | 12 | 130° | 925 095 | | | | | | |
| 11,6 | 47 | 104 | 12 | 130° | 925 096 | | | | | | |
| 11,7 | 47 | 104 | 12 | 130° | 925 097 | | | | | | |
| 11,8 | 47 | 104 | 12 | 130° | 925 098 | | | | | | |
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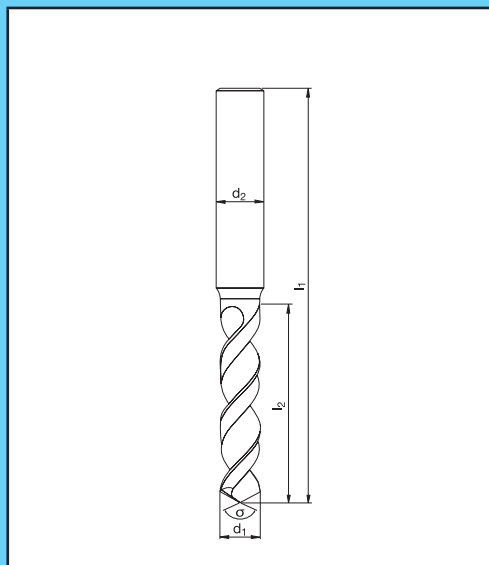
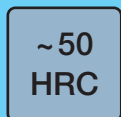
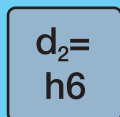
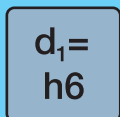
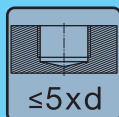
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|----------------------------|----------------|----------------------------------|----------------|------|------------------------|--|--|--|--|----------------------------|----------------|----------------------------------|----------------|------|------------------------|--|--|--|--|
| Catalogue n° ^{W%} | | Nr. di catalogo ^{W%} | | | TiCN | | | | | Catalogue n° ^{W%} | | Nr. di catalogo ^{W%} | | | TiCN | | | | |
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| 2,2 | 27 | 59 | 3 | 120° | 927 003 | | | | | 6,1 | 63 | 107 | 8 | 120° | 927 042 | | | | |
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| 3 | 33 | 65 | 3 | 120° | 927 011 | | | | | 6,9 | 69 | 113 | 8 | 120° | 927 050 | | | | |
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| 3,2 | 36 | 68 | 4 | 120° | 927 013 | | | | | 7,1 | 69 | 113 | 8 | 120° | 927 052 | | | | |
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| 5,8 | 57 | 101 | 6 | 120° | 927 039 | | | | | 9,7 | 87 | 137 | 10 | 120° | 927 078 | | | | |



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| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | 529 700 ⁶³⁰ TiCN | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | 529 700 ⁶³⁰ TiCN | | | | | | | | | |
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| 9,9 | 87 | 137 | 10 | 120° | 927 080 | 17 | 115 | 181 | 20 | 120° | 927 147 | | | | | | | | | | | | | |
| 10 | 87 | 137 | 10 | 120° | 927 081 | 17,5 | 118 | 184 | 20 | 120° | 927 152 | | | | | | | | | | | | | |
| 10,1 | 87 | 144 | 12 | 120° | 927 082 | 18 | 118 | 184 | 20 | 120° | 927 157 | | | | | | | | | | | | | |
| 10,2 | 87 | 144 | 12 | 120° | 927 083 | 18,5 | 122 | 188 | 20 | 120° | 927 162 | | | | | | | | | | | | | |
| 10,3 | 87 | 144 | 12 | 120° | 927 084 | 19 | 122 | 188 | 20 | 120° | 927 167 | | | | | | | | | | | | | |
| 10,4 | 87 | 144 | 12 | 120° | 927 085 | 19,5 | 125 | 191 | 20 | 120° | 927 172 | | | | | | | | | | | | | |
| 10,5 | 87 | 144 | 12 | 120° | 927 086 | 20 | 125 | 191 | 20 | 120° | 927 177 | | | | | | | | | | | | | |
| 10,6 | 87 | 144 | 12 | 120° | 927 087 | 20,5 | 128 | 204 | 25 | 120° | 927 182 | | | | | | | | | | | | | |
| 10,7 | 94 | 151 | 12 | 120° | 927 088 | 21 | 128 | 204 | 25 | 120° | 927 187 | | | | | | | | | | | | | |
| 10,8 | 94 | 151 | 12 | 120° | 927 089 | 21,5 | 132 | 208 | 25 | 120° | 927 192 | | | | | | | | | | | | | |
| 10,9 | 94 | 151 | 12 | 120° | 927 090 | 22 | 132 | 208 | 25 | 120° | 927 197 | | | | | | | | | | | | | |
| 11 | 94 | 151 | 12 | 120° | 927 091 | 22,5 | 136 | 212 | 25 | 120° | 927 202 | | | | | | | | | | | | | |
| 11,1 | 94 | 151 | 12 | 120° | 927 092 | 23 | 136 | 212 | 25 | 120° | 927 207 | | | | | | | | | | | | | |
| 11,2 | 94 | 151 | 12 | 120° | 927 093 | 23,5 | 136 | 212 | 25 | 120° | 927 212 | | | | | | | | | | | | | |
| 11,3 | 94 | 151 | 12 | 120° | 927 094 | 24 | 140 | 216 | 25 | 120° | 927 217 | | | | | | | | | | | | | |
| 11,4 | 94 | 151 | 12 | 120° | 927 095 | 24,5 | 140 | 216 | 25 | 120° | 927 222 | | | | | | | | | | | | | |
| 11,5 | 94 | 151 | 12 | 120° | 927 096 | 25 | 140 | 216 | 25 | 120° | 927 227 | | | | | | | | | | | | | |
| 11,6 | 94 | 151 | 12 | 120° | 927 097 | 25,5 | 145 | 225 | 32 | 120° | 927 232 | | | | | | | | | | | | | |
| 11,7 | 94 | 151 | 12 | 120° | 927 098 | 26 | 145 | 225 | 32 | 120° | 927 237 | | | | | | | | | | | | | |
| 11,8 | 94 | 151 | 12 | 120° | 927 099 | 26,5 | 145 | 225 | 32 | 120° | 927 242 | | | | | | | | | | | | | |
| 11,9 | 101 | 158 | 12 | 120° | 927 100 | 27 | 150 | 230 | 32 | 120° | 927 247 | | | | | | | | | | | | | |
| 12 | 101 | 158 | 12 | 120° | 927 101 | 28 | 150 | 230 | 32 | 120° | 927 257 | | | | | | | | | | | | | |
| 12,1 | 101 | 158 | 12 | 120° | 927 102 | 29 | 155 | 235 | 32 | 120° | 927 267 | | | | | | | | | | | | | |
| 12,2 | 101 | 158 | 12 | 120° | 927 103 | 30 | 155 | 235 | 32 | 120° | 927 277 | | | | | | | | | | | | | |
| 12,3 | 101 | 158 | 12 | 120° | 927 104 | 31 | 160 | 240 | 32 | 120° | 927 287 | | | | | | | | | | | | | |
| 12,4 | 101 | 158 | 12 | 120° | 927 105 | 32 | 165 | 245 | 32 | 120° | 927 297 | | | | | | | | | | | | | |
| 12,5 | 101 | 158 | 12 | 120° | 927 106 | | | | | | | | | | | | | | | | | | | |
| 12,6 | 101 | 158 | 12 | 120° | 927 107 | | | | | | | | | | | | | | | | | | | |
| 12,7 | 101 | 158 | 12 | 120° | 927 108 | | | | | | | | | | | | | | | | | | | |
| 12,8 | 101 | 158 | 12 | 120° | 927 109 | | | | | | | | | | | | | | | | | | | |
| 12,9 | 101 | 158 | 12 | 120° | 927 110 | | | | | | | | | | | | | | | | | | | |
| 13 | 101 | 158 | 12 | 120° | 927 111 | | | | | | | | | | | | | | | | | | | |
| 13,5 | 106 | 166 | 16 | 120° | 927 112 | | | | | | | | | | | | | | | | | | | |
| 14 | 106 | 166 | 16 | 120° | 927 117 | | | | | | | | | | | | | | | | | | | |
| 14,5 | 109 | 169 | 16 | 120° | 927 122 | | | | | | | | | | | | | | | | | | | |
| 15 | 109 | 169 | 16 | 120° | 927 127 | | | | | | | | | | | | | | | | | | | |
| 15,5 | 112 | 172 | 16 | 120° | 927 132 | | | | | | | | | | | | | | | | | | | |
| 16 | 112 | 172 | 16 | 120° | 927 137 | | | | | | | | | | | | | | | | | | | |






Katalog-Nr. ^{W%} Catalogue no. ^{W%} **026 005⁶¹⁰**
 Catalogue n° ^{W%} Nr. di catalogo ^{W%} **FUTURA TOP**


Werkstoffgruppen Classification of work materials 1.1-1.6; 2.1-2.4;
 Groupes de matières Gruppo materiali 3.1-3.5; 4; 5; 7

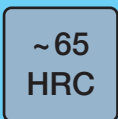
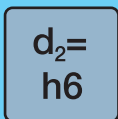
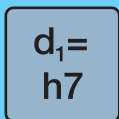
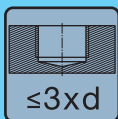
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| 0,35 | 5,5 | 38 | 3 | 130° | 022 035 |
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| 0,45 | 6,0 | 38 | 3 | 130° | 022 045 |
| 0,50 | 6,0 | 38 | 3 | 130° | 022 050 |
| 0,55 | 8,0 | 38 | 3 | 130° | 022 055 |
| 0,60 | 8,0 | 38 | 3 | 130° | 022 060 |
| 0,65 | 8,0 | 38 | 3 | 130° | 022 065 |
| 0,70 | 8,0 | 38 | 3 | 130° | 022 070 |
| 0,75 | 8,0 | 38 | 3 | 130° | 022 075 |
| 0,80 | 8,0 | 38 | 3 | 130° | 022 080 |
| 0,85 | 8,0 | 38 | 3 | 130° | 022 085 |
| 0,90 | 8,0 | 38 | 3 | 130° | 022 090 |
| 0,95 | 8,0 | 38 | 3 | 130° | 022 095 |
| 1,00 | 10,0 | 38 | 3 | 130° | 022 100 |
| 1,05 | 10,0 | 38 | 3 | 130° | 022 105 |
| 1,10 | 10,0 | 38 | 3 | 130° | 022 110 |
| 1,15 | 10,0 | 38 | 3 | 130° | 022 115 |
| 1,20 | 10,0 | 38 | 3 | 130° | 022 120 |
| 1,25 | 10,0 | 38 | 3 | 130° | 022 125 |
| 1,30 | 10,0 | 38 | 3 | 130° | 022 130 |
| 1,35 | 10,0 | 38 | 3 | 130° | 022 135 |
| 1,40 | 10,0 | 38 | 3 | 130° | 022 140 |
| 1,45 | 10,0 | 38 | 3 | 130° | 022 145 |
| 1,50 | 12,0 | 38 | 3 | 130° | 022 150 |
| 1,55 | 12,0 | 38 | 3 | 130° | 022 155 |
| 1,60 | 12,0 | 38 | 3 | 130° | 022 160 |
| 1,65 | 12,0 | 38 | 3 | 130° | 022 165 |
| 1,70 | 12,0 | 38 | 3 | 130° | 022 170 |
| 1,75 | 12,0 | 38 | 3 | 130° | 022 175 |
| 1,80 | 12,0 | 38 | 3 | 130° | 022 180 |
| 1,85 | 12,0 | 38 | 3 | 130° | 022 185 |
| 1,90 | 12,0 | 38 | 3 | 130° | 022 190 |
| 1,95 | 12,0 | 38 | 3 | 130° | 022 195 |



| 026 005 | | VHM | Typ UNI | ≤5xd | FUTURA TOP |  | | | | | | | | | | | |
|-----------------------|---------|----------------------|-------------|----------------------|-------------|---|-------------|----------------------|-------------|-------------------------|-------------|----------------------|-------------|----------------------|-------------|----------------------|-------------|
| MAT | 320-325 | 1.1-1.3 | | 1.4-1.5 | | | | | | | | 1.6.1-1.6.4 | | 1.6.5-1.6.6 | | 2.1-2.2; 7.3 | |
| | | | | (<1000 N/mm²) | | (1000-1200 N/mm²) | | (1200-1500 N/mm²) | | (<50 HRC) (<1700 N/mm²) | | | | | | | |
| V _c | | 50 ~ 70 m/min | | 50 ~ 60 m/min | | 45 ~ 55 m/min | | 30 ~ 35 m/min | | 15 ~ 25 m/min | | 25 ~ 40 m/min | | 20 ~ 32 m/min | | 60 ~ 80 m/min | |
| d ₁ ∅ [mm] | | n | f | n | f | n | f | n | f | n | f | n | f | n | f | n | f |
| | | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] |
| 0,1 ~ 0,2 | | 42.000 | 0,002~0,004 | 42.000 | 0,002~0,004 | 42.000 | 0,002~0,004 | 42.000 | 0,002~0,004 | 42.000 | 0,002~0,004 | 42.000 | 0,002~0,004 | 42.000 | 0,002~0,004 | 42.000 | 0,002~0,004 |
| 0,25 ~ 0,35 | | 42.000 | 0,004~0,006 | 42.000 | 0,004~0,006 | 42.000 | 0,004~0,006 | 31.830 | 0,004~0,006 | 22.740 | 0,004~0,006 | 36.380 | 0,004~0,006 | 29.100 | 0,004~0,006 | 42.000 | 0,004~0,006 |
| 0,4 ~ 0,5 | | 42.000 | 0,006~0,008 | 38.200 | 0,006~0,008 | 35.010 | 0,006~0,008 | 22.280 | 0,006~0,008 | 15.920 | 0,006~0,008 | 25.460 | 0,006~0,008 | 20.370 | 0,006~0,008 | 42.000 | 0,006~0,008 |
| 0,55 ~ 0,65 | | 31.830 | 0,008~0,01 | 29.380 | 0,008~0,01 | 26.930 | 0,008~0,01 | 17.140 | 0,008~0,01 | 12.240 | 0,008~0,01 | 19.590 | 0,008~0,01 | 15.670 | 0,008~0,01 | 39.180 | 0,008~0,01 |
| 0,7 ~ 0,8 | | 25.860 | 0,01~0,012 | 23.870 | 0,01~0,012 | 21.880 | 0,01~0,012 | 13.930 | 0,01~0,012 | 9.950 | 0,01~0,012 | 15.920 | 0,01~0,012 | 12.730 | 0,01~0,012 | 31.830 | 0,01~0,012 |
| 0,85 ~ 0,95 | | 21.780 | 0,012~0,018 | 20.100 | 0,012~0,018 | 18.430 | 0,012~0,018 | 11.730 | 0,012~0,018 | 8.380 | 0,012~0,016 | 13.400 | 0,012~0,018 | 10.720 | 0,012~0,018 | 26.810 | 0,012~0,018 |
| 1,0 ~ 1,2 | | 17.240 | 0,018~0,024 | 15.920 | 0,018~0,024 | 14.590 | 0,018~0,024 | 9.280 | 0,018~0,024 | 6.630 | 0,016~0,02 | 10.610 | 0,018~0,024 | 8.490 | 0,018~0,024 | 21.220 | 0,018~0,024 |
| 1,25 ~ 1,45 | | 14.270 | 0,024~0,032 | 13.170 | 0,024~0,032 | 12.070 | 0,024~0,032 | 7.680 | 0,024~0,032 | 5.490 | 0,02~0,024 | 8.780 | 0,024~0,032 | 7.020 | 0,024~0,032 | 17.560 | 0,024~0,032 |
| 1,5 ~ 1,7 | | 12.170 | 0,032~0,040 | 11.230 | 0,032~0,040 | 10.300 | 0,032~0,040 | 6.550 | 0,032~0,040 | 4.680 | 0,024~0,032 | 7.490 | 0,032~0,040 | 5.990 | 0,032~0,040 | 14.980 | 0,032~0,040 |
| 1,75 ~ 1,95 | | 10.610 | 0,040~0,048 | 9.790 | 0,040~0,048 | 8.980 | 0,040~0,048 | 5.710 | 0,040~0,048 | 4.080 | 0,032~0,04 | 6.530 | 0,040~0,048 | 5.220 | 0,040~0,048 | 13.060 | 0,040~0,048 |

| MAT | 320-325 | 2.3-2.4 | | 3.1-3.3 | | 3.4-3.5 | | 4.1-4.2; 7.1 | | 4.3-4.5; 7.2 | | 5 | |
|-----------------------|---------|----------------------|-------------|----------------------|-------------|----------------------|-------------|----------------------|-------------|----------------------|-------------|----------------------|-------------|
| V _c | | 50 ~ 70 m/min | | 30 ~ 45 m/min | | 25 ~ 35 m/min | | 100 ~ 140 m/min | | 60 ~ 90 m/min | | 15 ~ 20 m/min | |
| d ₁ ∅ [mm] | | n | f | n | f | n | f | n | f | n | f | n | f |
| | | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] |
| 0,1 ~ 0,2 | | 42.000 | 0,002~0,004 | 42.000 | 0,002~0,004 | 42.000 | 0,002~0,004 | 42.000 | 0,002~0,004 | 42.000 | 0,002~0,004 | 31.830 | 0,002~0,004 |
| 0,25 ~ 0,35 | | 42.000 | 0,004~0,006 | 40.930 | 0,004~0,006 | 31.830 | 0,004~0,006 | 42.000 | 0,004~0,006 | 42.000 | 0,004~0,006 | 18.190 | 0,004~0,006 |
| 0,4 ~ 0,5 | | 42.000 | 0,006~0,008 | 28.650 | 0,006~0,008 | 22.280 | 0,006~0,008 | 42.000 | 0,006~0,008 | 42.000 | 0,006~0,008 | 12.730 | 0,006~0,008 |
| 0,55 ~ 0,65 | | 31.830 | 0,008~0,01 | 22.040 | 0,008~0,01 | 17.140 | 0,008~0,01 | 42.000 | 0,008~0,01 | 42.000 | 0,008~0,01 | 9.790 | 0,008~0,01 |
| 0,7 ~ 0,8 | | 25.860 | 0,01~0,012 | 17.900 | 0,01~0,012 | 13.930 | 0,01~0,012 | 42.000 | 0,01~0,012 | 35.810 | 0,01~0,012 | 7.960 | 0,01~0,012 |
| 0,85 ~ 0,95 | | 21.780 | 0,012~0,018 | 15.080 | 0,012~0,018 | 11.730 | 0,012~0,016 | 42.000 | 0,012~0,021 | 30.160 | 0,012~0,018 | 6.700 | 0,012~0,018 |
| 1,0 ~ 1,2 | | 17.240 | 0,018~0,024 | 11.940 | 0,018~0,024 | 9.280 | 0,016~0,02 | 37.140 | 0,021~0,032 | 23.870 | 0,018~0,024 | 5.310 | 0,018~0,024 |
| 1,25 ~ 1,45 | | 14.270 | 0,024~0,032 | 9.880 | 0,024~0,032 | 7.680 | 0,02~0,024 | 30.730 | 0,032~0,048 | 19.760 | 0,024~0,032 | 4.390 | 0,024~0,032 |
| 1,5 ~ 1,7 | | 12.170 | 0,032~0,040 | 8.430 | 0,032~0,040 | 6.550 | 0,024~0,032 | 26.210 | 0,048~0,064 | 15.920 | 0,032~0,040 | 3.740 | 0,032~0,040 |
| 1,75 ~ 1,95 | | 10.610 | 0,040~0,048 | 7.350 | 0,040~0,048 | 5.710 | 0,032~0,04 | 22.850 | 0,064~0,08 | 13.760 | 0,040~0,048 | 3.260 | 0,040~0,048 |

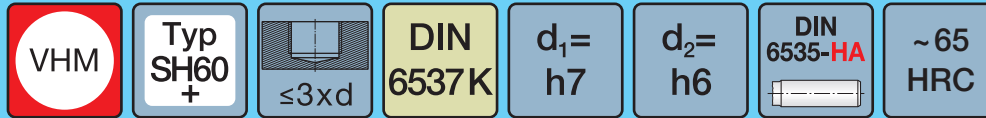
| | |
|---|--|
|  | <p>Als Kühlmittel sollte Emulsion verwendet werden. As coolant please use emulsion. Il est nécessaire de lubrifier avec de l'émulsion. Il lubrificante consigliato e' l'emulsione.</p> |
|---|--|



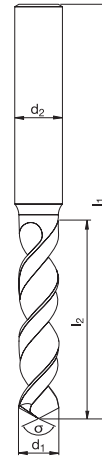
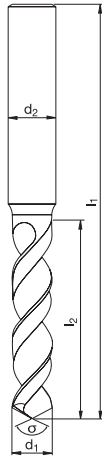
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | 022 003 ⁶¹⁰ TiAlN | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | | | | 022 003 ⁶¹⁰ TiAlN | | | | |
|--|------------------------|------------------------|------------------------|----------|--|------------------------|------------------------|------------------------|------------------------|--|------------|--|--|--|--|--|--|--|--|
| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | |
| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | | | | | | | | |
| 2 | 20 | 55 | 4 | 140° | 422 020 HA | 5,8 | 28 | 66 | 6 | 140° | 422 058 HA | | | | | | | | |
| 2,1 | 20 | 55 | 4 | 140° | 422 021 HA | 5,9 | 28 | 66 | 6 | 140° | 422 059 HA | | | | | | | | |
| 2,2 | 20 | 55 | 4 | 140° | 422 022 HA | 6 | 28 | 66 | 6 | 140° | 422 060 HA | | | | | | | | |
| 2,3 | 20 | 55 | 4 | 140° | 422 023 HA | 6,1 | 34 | 79 | 8 | 140° | 422 061 HA | | | | | | | | |
| 2,4 | 20 | 55 | 4 | 140° | 422 024 HA | 6,2 | 34 | 79 | 8 | 140° | 422 062 HA | | | | | | | | |
| 2,5 | 20 | 55 | 4 | 140° | 422 025 HA | 6,3 | 34 | 79 | 8 | 140° | 422 063 HA | | | | | | | | |
| 2,55 | 20 | 55 | 4 | 140° | 422 0255 HA | 6,4 | 34 | 79 | 8 | 140° | 422 064 HA | | | | | | | | |
| 2,6 | 20 | 55 | 4 | 140° | 422 026 HA | 6,5 | 34 | 79 | 8 | 140° | 422 065 HA | | | | | | | | |
| 2,7 | 20 | 55 | 4 | 140° | 422 027 HA | 6,6 | 34 | 79 | 8 | 140° | 422 066 HA | | | | | | | | |
| 2,8 | 20 | 55 | 4 | 140° | 422 028 HA | 6,7 | 34 | 79 | 8 | 140° | 422 067 HA | | | | | | | | |
| 2,9 | 20 | 55 | 4 | 140° | 422 029 HA | 6,8 | 34 | 79 | 8 | 140° | 422 068 HA | | | | | | | | |
| 3 | 20 | 62 | 6 | 140° | 422 030 HA | 6,9 | 34 | 79 | 8 | 140° | 422 069 HA | | | | | | | | |
| 3,1 | 20 | 62 | 6 | 140° | 422 031 HA | 7 | 34 | 79 | 8 | 140° | 422 070 HA | | | | | | | | |
| 3,2 | 20 | 62 | 6 | 140° | 422 032 HA | 7,1 | 41 | 79 | 8 | 140° | 422 071 HA | | | | | | | | |
| 3,3 | 20 | 62 | 6 | 140° | 422 033 HA | 7,2 | 41 | 79 | 8 | 140° | 422 072 HA | | | | | | | | |
| 3,4 | 20 | 62 | 6 | 140° | 422 034 HA | 7,3 | 41 | 79 | 8 | 140° | 422 073 HA | | | | | | | | |
| 3,5 | 20 | 62 | 6 | 140° | 422 035 HA | 7,4 | 41 | 79 | 8 | 140° | 422 074 HA | | | | | | | | |
| 3,6 | 20 | 62 | 6 | 140° | 422 036 HA | 7,5 | 41 | 79 | 8 | 140° | 422 075 HA | | | | | | | | |
| 3,7 | 20 | 62 | 6 | 140° | 422 037 HA | 7,6 | 41 | 79 | 8 | 140° | 422 076 HA | | | | | | | | |
| 3,8 | 24 | 66 | 6 | 140° | 422 038 HA | 7,7 | 41 | 79 | 8 | 140° | 422 077 HA | | | | | | | | |
| 3,9 | 24 | 66 | 6 | 140° | 422 039 HA | 7,8 | 41 | 79 | 8 | 140° | 422 078 HA | | | | | | | | |
| 4 | 24 | 66 | 6 | 140° | 422 040 HA | 7,9 | 41 | 79 | 8 | 140° | 422 079 HA | | | | | | | | |
| 4,1 | 24 | 66 | 6 | 140° | 422 041 HA | 8 | 41 | 79 | 8 | 140° | 422 080 HA | | | | | | | | |
| 4,2 | 24 | 66 | 6 | 140° | 422 042 HA | 8,1 | 47 | 89 | 10 | 140° | 422 081 HA | | | | | | | | |
| 4,3 | 24 | 66 | 6 | 140° | 422 043 HA | 8,2 | 47 | 89 | 10 | 140° | 422 082 HA | | | | | | | | |
| 4,4 | 24 | 66 | 6 | 140° | 422 044 HA | 8,3 | 47 | 89 | 10 | 140° | 422 083 HA | | | | | | | | |
| 4,5 | 24 | 66 | 6 | 140° | 422 045 HA | 8,4 | 47 | 89 | 10 | 140° | 422 084 HA | | | | | | | | |
| 4,6 | 24 | 66 | 6 | 140° | 422 046 HA | 8,5 | 47 | 89 | 10 | 140° | 422 085 HA | | | | | | | | |
| 4,7 | 24 | 66 | 6 | 140° | 422 047 HA | 8,6 | 47 | 89 | 10 | 140° | 422 086 HA | | | | | | | | |
| 4,8 | 28 | 66 | 6 | 140° | 422 048 HA | 8,7 | 47 | 89 | 10 | 140° | 422 087 HA | | | | | | | | |
| 4,9 | 28 | 66 | 6 | 140° | 422 049 HA | 8,8 | 47 | 89 | 10 | 140° | 422 088 HA | | | | | | | | |
| 5 | 28 | 66 | 6 | 140° | 422 050 HA | 8,9 | 47 | 89 | 10 | 140° | 422 089 HA | | | | | | | | |
| 5,1 | 28 | 66 | 6 | 140° | 422 051 HA | 9 | 47 | 89 | 10 | 140° | 422 090 HA | | | | | | | | |
| 5,2 | 28 | 66 | 6 | 140° | 422 052 HA | 9,1 | 47 | 89 | 10 | 140° | 422 091 HA | | | | | | | | |
| 5,3 | 28 | 66 | 6 | 140° | 422 053 HA | 9,2 | 47 | 89 | 10 | 140° | 422 092 HA | | | | | | | | |
| 5,4 | 28 | 66 | 6 | 140° | 422 054 HA | 9,3 | 47 | 89 | 10 | 140° | 422 093 HA | | | | | | | | |
| 5,5 | 28 | 66 | 6 | 140° | 422 055 HA | 9,4 | 47 | 89 | 10 | 140° | 422 094 HA | | | | | | | | |
| 5,6 | 28 | 66 | 6 | 140° | 422 056 HA | 9,5 | 47 | 89 | 10 | 140° | 422 095 HA | | | | | | | | |
| 5,7 | 28 | 66 | 6 | 140° | 422 057 HA | 9,6 | 47 | 89 | 10 | 140° | 422 096 HA | | | | | | | | |

VHM



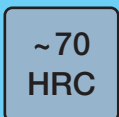
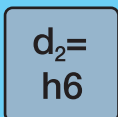
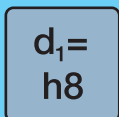
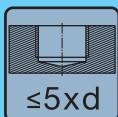


VHM



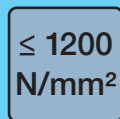
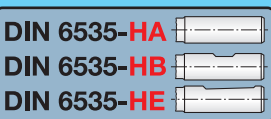
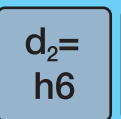
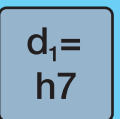
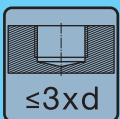
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|---|------------------------|--|------------------------|----------|--|------------------------|---|------------------------|--|----------|------------|--|--|
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1.1-1.5; 2.1-2.3; 8.2 | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1.1-1.5; 2.1-2.3; 8.2 | |
| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | | |
| 9,7 | 47 | 89 | 10 | 140° | 422 097 HA | 15,5 | 65 | 115 | 16 | 140° | 422 155 HA | | |
| 9,8 | 47 | 89 | 10 | 140° | 422 098 HA | 16 | 65 | 115 | 16 | 140° | 422 160 HA | | |
| 9,9 | 47 | 89 | 10 | 140° | 422 099 HA | 16,5 | 73 | 123 | 18 | 140° | 422 165 HA | | |
| 10 | 47 | 89 | 10 | 140° | 422 100 HA | 17 | 73 | 123 | 18 | 140° | 422 170 HA | | |
| 10,1 | 55 | 102 | 12 | 140° | 422 101 HA | 17,5 | 73 | 123 | 18 | 140° | 422 175 HA | | |
| 10,2 | 55 | 102 | 12 | 140° | 422 102 HA | 17,7 | 73 | 123 | 18 | 140° | 422 177 HA | | |
| 10,3 | 55 | 102 | 12 | 140° | 422 103 HA | 18 | 73 | 123 | 18 | 140° | 422 180 HA | | |
| 10,4 | 55 | 102 | 12 | 140° | 422 104 HA | 18,5 | 79 | 131 | 20 | 140° | 422 185 HA | | |
| 10,5 | 55 | 102 | 12 | 140° | 422 105 HA | 18,6 | 79 | 131 | 20 | 140° | 422 186 HA | | |
| 10,6 | 55 | 102 | 12 | 140° | 422 106 HA | 19 | 79 | 131 | 20 | 140° | 422 190 HA | | |
| 10,7 | 55 | 102 | 12 | 140° | 422 107 HA | 19,5 | 79 | 131 | 20 | 140° | 422 195 HA | | |
| 10,8 | 55 | 102 | 12 | 140° | 422 108 HA | 20 | 79 | 131 | 20 | 140° | 422 200 HA | | |
| 10,9 | 55 | 102 | 12 | 140° | 422 109 HA | | | | | | | | |
| 11 | 55 | 102 | 12 | 140° | 422 110 HA | | | | | | | | |
| 11,1 | 55 | 102 | 12 | 140° | 422 111 HA | | | | | | | | |
| 11,2 | 55 | 102 | 12 | 140° | 422 112 HA | | | | | | | | |
| 11,3 | 55 | 102 | 12 | 140° | 422 113 HA | | | | | | | | |
| 11,4 | 55 | 102 | 12 | 140° | 422 114 HA | | | | | | | | |
| 11,5 | 55 | 102 | 12 | 140° | 422 115 HA | | | | | | | | |
| 11,6 | 55 | 102 | 12 | 140° | 422 116 HA | | | | | | | | |
| 11,7 | 55 | 102 | 12 | 140° | 422 117 HA | | | | | | | | |
| 11,8 | 55 | 102 | 12 | 140° | 422 118 HA | | | | | | | | |
| 11,9 | 55 | 102 | 12 | 140° | 422 119 HA | | | | | | | | |
| 12 | 55 | 102 | 12 | 140° | 422 120 HA | | | | | | | | |
| 12,1 | 60 | 107 | 14 | 140° | 422 121 HA | | | | | | | | |
| 12,2 | 60 | 107 | 14 | 140° | 422 122 HA | | | | | | | | |
| 12,5 | 60 | 107 | 14 | 140° | 422 125 HA | | | | | | | | |
| 12,6 | 60 | 107 | 14 | 140° | 422 126 HA | | | | | | | | |
| 13 | 60 | 107 | 14 | 140° | 422 130 HA | | | | | | | | |
| 13,5 | 60 | 107 | 14 | 140° | 422 135 HA | | | | | | | | |
| 14 | 60 | 107 | 14 | 140° | 422 140 HA | | | | | | | | |
| 14,1 | 65 | 115 | 16 | 140° | 422 141 HA | | | | | | | | |
| 14,2 | 65 | 115 | 16 | 140° | 422 142 HA | | | | | | | | |
| 14,5 | 65 | 115 | 16 | 140° | 422 145 HA | | | | | | | | |
| 14,6 | 65 | 115 | 16 | 140° | 422 146 HA | | | | | | | | |
| 15 | 65 | 115 | 16 | 140° | 422 150 HA | | | | | | | | |



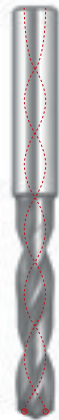
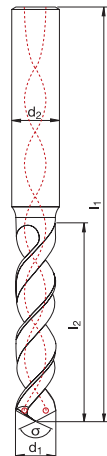
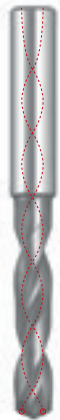
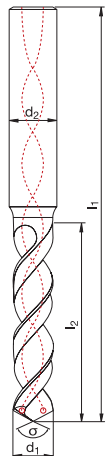


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|---|------------------------|------------------------|------------------------|----------|---|------------------------|------------------------|------------------------|------------------------|---|----------|------------------------|------------------------|------------------------|---|----------|----------|--|--|
| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | |
| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | | |
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| 2,55 | 14 | 44 | 3 | 120° | 020 600 | 11,9 | 71 | 119 | 11,9 | 120° | 020 690 | | | | | | | | |
| 3 | 16 | 46 | 3 | 120° | 020 601 | 12 | 71 | 127 | 12 | 120° | 020 691 | | | | | | | | |
| 3,1 | 16 | 48 | 4 | 120° | 020 602 | 12,1 | 76 | 136 | 16 | 120° | 020 692 | | | | | | | | |
| 3,2 | 16 | 48 | 4 | 120° | 020 603 | 12,6 | 79 | 139 | 16 | 120° | 020 693 | | | | | | | | |
| 3,3 | 18 | 48 | 4 | 120° | 020 604 | 14,1 | 90 | 150 | 16 | 120° | 020 694 | | | | | | | | |
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| 3,5 | 20 | 50 | 4 | 120° | 020 606 | 17,7 | 108 | 168 | 20 | 120° | 020 699 | | | | | | | | |
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| 3,8 | 22 | 52 | 4 | 120° | 020 609 | | | | | | | | | | | | | | |
| 4 | 22 | 52 | 4 | 120° | 020 611 | | | | | | | | | | | | | | |
| 4,1 | 25 | 65 | 6 | 120° | 020 612 | | | | | | | | | | | | | | |
| 4,2 | 25 | 65 | 6 | 120° | 020 613 | | | | | | | | | | | | | | |
| 4,3 | 28 | 68 | 6 | 120° | 020 614 | | | | | | | | | | | | | | |
| 4,4 | 28 | 68 | 6 | 120° | 020 615 | | | | | | | | | | | | | | |
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| 5,1 | 32 | 72 | 6 | 120° | 020 622 | | | | | | | | | | | | | | |
| 5,2 | 32 | 72 | 6 | 120° | 020 623 | | | | | | | | | | | | | | |
| 5,5 | 35 | 75 | 6 | 120° | 020 626 | | | | | | | | | | | | | | |
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| 5,9 | 35 | 75 | 6 | 120° | 020 630 | | | | | | | | | | | | | | |
| 6 | 35 | 75 | 6 | 120° | 020 631 | | | | | | | | | | | | | | |
| 6,5 | 40 | 80 | 6,5 | 120° | 020 636 | | | | | | | | | | | | | | |
| 6,6 | 40 | 80 | 6,6 | 120° | 020 637 | | | | | | | | | | | | | | |
| 6,9 | 45 | 85 | 6,9 | 120° | 020 640 | | | | | | | | | | | | | | |
| 7 | 45 | 85 | 7 | 120° | 020 641 | | | | | | | | | | | | | | |
| 7,1 | 45 | 85 | 7,1 | 120° | 020 642 | | | | | | | | | | | | | | |
| 7,4 | 45 | 85 | 7,4 | 120° | 020 645 | | | | | | | | | | | | | | |
| 7,6 | 50 | 98 | 7,6 | 120° | 020 647 | | | | | | | | | | | | | | |
| 8,6 | 57 | 105 | 8,6 | 120° | 020 657 | | | | | | | | | | | | | | |
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| 8,9 | 57 | 105 | 8,9 | 120° | 020 660 | | | | | | | | | | | | | | |
| 9 | 57 | 105 | 9 | 120° | 020 661 | | | | | | | | | | | | | | |
| 9,1 | 57 | 105 | 9,1 | 120° | 020 662 | | | | | | | | | | | | | | |
| 10 | 63 | 111 | 10 | 120° | 020 671 | | | | | | | | | | | | | | |
| 10,4 | 63 | 111 | 10,4 | 120° | 020 675 | | | | | | | | | | | | | | |
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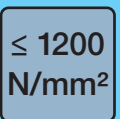
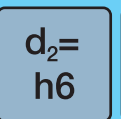
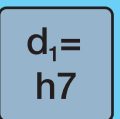
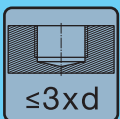


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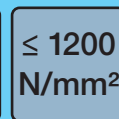
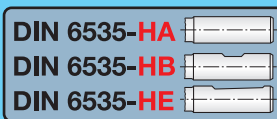
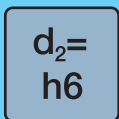
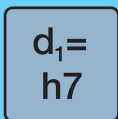
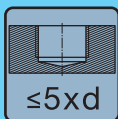
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|--|------------------------|--|------------------------|--|-------------------|--|------------------------|------------------------|------------------------|----------|-------------------|
| Catalogue n ^o ^{W%} | | TiAlN | | Catalogue n ^o ^{W%} | | TiAlN | | | | | |
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | |
| | | 1.1-1.6; 2.1-2.4; 3.1-3.4; 4; 5 | | | | 1.1-1.6; 2.1-2.4; 3.1-3.4; 4; 5 | | | | | |
| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
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| 2,1 | 20 | 55 | 4 | 135° | 423 321 HA | 6 | 28 | 66 | 6 | 135° | 423 360 H? |
| 2,2 | 20 | 55 | 4 | 135° | 423 322 HA | 6,1 | 34 | 79 | 8 | 135° | 423 361 H? |
| 2,3 | 20 | 55 | 4 | 135° | 423 323 HA | 6,2 | 34 | 79 | 8 | 135° | 423 362 H? |
| 2,4 | 20 | 55 | 4 | 135° | 423 324 HA | 6,3 | 34 | 79 | 8 | 135° | 423 363 H? |
| 2,5 | 20 | 55 | 4 | 135° | 423 325 HA | 6,4 | 34 | 79 | 8 | 135° | 423 364 H? |
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| 2,7 | 20 | 55 | 4 | 135° | 423 327 HA | 6,6 | 34 | 79 | 8 | 135° | 423 366 H? |
| 2,8 | 20 | 55 | 4 | 135° | 423 328 HA | 6,7 | 34 | 79 | 8 | 135° | 423 367 H? |
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| 3 | 20 | 62 | 6 | 135° | 423 330 H? | 6,9 | 34 | 79 | 8 | 135° | 423 369 H? |
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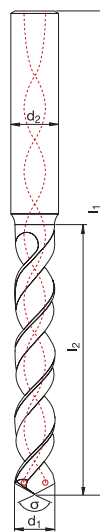
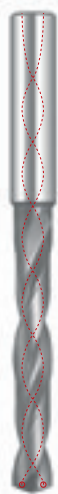
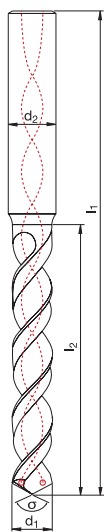


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|---|------------------------|------------------------|------------------------|----------|--|------------------------|------------------------|------------------------|------------------------|---|-------------------|------------------------|------------------------|------------------------|--|----------|-------------------|--|--|
| Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | | Werkstoffgruppen Groupes de matières | | | | | Classification of work materials Gruppo materiali | | | | |
| 1.1–1.6; 2.1–2.4; 3.1–3.4; 4; 5 | | | | | 1.1–1.6; 2.1–2.4; 3.1–3.4; 4; 5 | | | | | 1.1–1.6; 2.1–2.4; 3.1–3.4; 4; 5 | | | | | 1.1–1.6; 2.1–2.4; 3.1–3.4; 4; 5 | | | | |
| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | | |
| 9,8 | 47 | 89 | 10 | 135° | 423 398 H? | 17,8 | 73 | 123 | 18 | 135° | 423 478 H? | 9,8 | 47 | 89 | 10 | 135° | 423 398 H? | | |
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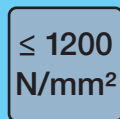
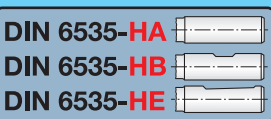
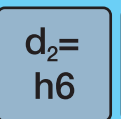
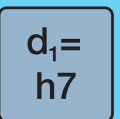
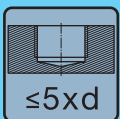




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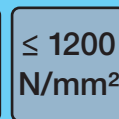
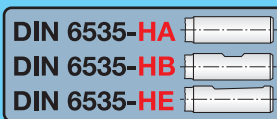
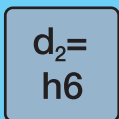
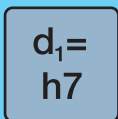
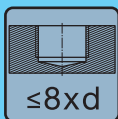


| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 024 005 ⁶¹⁰ TiAlN | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | 024 005 ⁶¹⁰ TiAlN | | | | | |
|--|------------------------|--|------------------------|--|-------------------|--|------------------------|------------------------|------------------------|----------|-------------------|
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | | | |
| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
| 2 | 21 | 57 | 4 | 135° | 424 320 HA | 5,3 | 44 | 82 | 6 | 135° | 424 353 H? |
| 2,1 | 21 | 57 | 4 | 135° | 424 321 HA | 5,4 | 44 | 82 | 6 | 135° | 424 354 H? |
| 2,2 | 21 | 57 | 4 | 135° | 424 322 HA | 5,5 | 44 | 82 | 6 | 135° | 424 355 H? |
| 2,3 | 21 | 57 | 4 | 135° | 424 323 HA | 5,52 | 44 | 82 | 6 | 135° | 424 508 H? |
| 2,4 | 21 | 57 | 4 | 135° | 424 324 HA | 5,6 | 44 | 82 | 6 | 135° | 424 356 H? |
| 2,5 | 21 | 57 | 4 | 135° | 424 325 HA | 5,7 | 44 | 82 | 6 | 135° | 424 357 H? |
| 2,52 | 21 | 57 | 4 | 135° | 424 502 HA | 5,8 | 44 | 82 | 6 | 135° | 424 358 H? |
| 2,6 | 21 | 57 | 4 | 135° | 424 326 HA | 5,9 | 44 | 82 | 6 | 135° | 424 359 H? |
| 2,7 | 21 | 57 | 4 | 135° | 424 327 HA | 6 | 44 | 82 | 6 | 135° | 424 360 H? |
| 2,8 | 21 | 57 | 4 | 135° | 424 328 HA | 6,02 | 44 | 82 | 6 | 135° | 424 509 H? |
| 2,9 | 21 | 57 | 4 | 135° | 424 329 HA | 6,1 | 53 | 91 | 8 | 135° | 424 361 H? |
| 3 | 28 | 66 | 6 | 135° | 424 330 H? | 6,2 | 53 | 91 | 8 | 135° | 424 362 H? |
| 3,02 | 28 | 66 | 6 | 135° | 424 503 H? | 6,3 | 53 | 91 | 8 | 135° | 424 363 H? |
| 3,1 | 28 | 66 | 6 | 135° | 424 331 H? | 6,4 | 53 | 91 | 8 | 135° | 424 364 H? |
| 3,2 | 28 | 66 | 6 | 135° | 424 332 H? | 6,5 | 53 | 91 | 8 | 135° | 424 365 H? |
| 3,3 | 28 | 66 | 6 | 135° | 424 333 H? | 6,52 | 53 | 91 | 8 | 135° | 424 510 H? |
| 3,4 | 28 | 66 | 6 | 135° | 424 334 H? | 6,6 | 53 | 91 | 8 | 135° | 424 366 H? |
| 3,5 | 28 | 66 | 6 | 135° | 424 335 H? | 6,7 | 53 | 91 | 8 | 135° | 424 367 H? |
| 3,52 | 28 | 66 | 6 | 135° | 424 504 H? | 6,8 | 53 | 91 | 8 | 135° | 424 368 H? |
| 3,6 | 28 | 66 | 6 | 135° | 424 336 H? | 6,9 | 53 | 91 | 8 | 135° | 424 369 H? |
| 3,7 | 28 | 66 | 6 | 135° | 424 337 H? | 7 | 53 | 91 | 8 | 135° | 424 370 H? |
| 3,8 | 36 | 74 | 6 | 135° | 424 338 H? | 7,02 | 53 | 91 | 8 | 135° | 424 511 H? |
| 3,9 | 36 | 74 | 6 | 135° | 424 339 H? | 7,1 | 53 | 91 | 8 | 135° | 424 371 H? |
| 4 | 36 | 74 | 6 | 135° | 424 340 H? | 7,2 | 53 | 91 | 8 | 135° | 424 372 H? |
| 4,02 | 36 | 74 | 6 | 135° | 424 505 H? | 7,3 | 53 | 91 | 8 | 135° | 424 373 H? |
| 4,1 | 36 | 74 | 6 | 135° | 424 341 H? | 7,4 | 53 | 91 | 8 | 135° | 424 374 H? |
| 4,2 | 36 | 74 | 6 | 135° | 424 342 H? | 7,5 | 53 | 91 | 8 | 135° | 424 375 H? |
| 4,3 | 36 | 74 | 6 | 135° | 424 343 H? | 7,6 | 53 | 91 | 8 | 135° | 424 376 H? |
| 4,4 | 36 | 74 | 6 | 135° | 424 344 H? | 7,7 | 53 | 91 | 8 | 135° | 424 377 H? |
| 4,5 | 36 | 74 | 6 | 135° | 424 345 H? | 7,8 | 53 | 91 | 8 | 135° | 424 378 H? |
| 4,52 | 36 | 74 | 6 | 135° | 424 506 H? | 7,9 | 53 | 91 | 8 | 135° | 424 379 H? |
| 4,6 | 36 | 74 | 6 | 135° | 424 346 H? | 8 | 53 | 91 | 8 | 135° | 424 380 H? |
| 4,7 | 36 | 74 | 6 | 135° | 424 347 H? | 8,02 | 53 | 91 | 8 | 135° | 424 512 H? |
| 4,8 | 44 | 82 | 6 | 135° | 424 348 H? | 8,1 | 61 | 103 | 10 | 135° | 424 381 H? |
| 4,9 | 44 | 82 | 6 | 135° | 424 349 H? | 8,2 | 61 | 103 | 10 | 135° | 424 382 H? |
| 5 | 44 | 82 | 6 | 135° | 424 350 H? | 8,3 | 61 | 103 | 10 | 135° | 424 383 H? |
| 5,02 | 44 | 82 | 6 | 135° | 424 507 H? | 8,4 | 61 | 103 | 10 | 135° | 424 384 H? |
| 5,1 | 44 | 82 | 6 | 135° | 424 351 H? | 8,5 | 61 | 103 | 10 | 135° | 424 385 H? |
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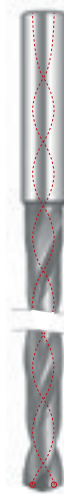
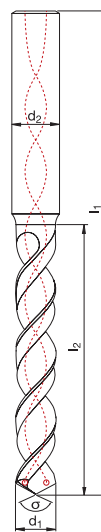
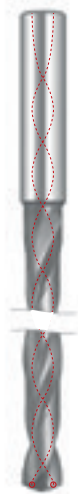
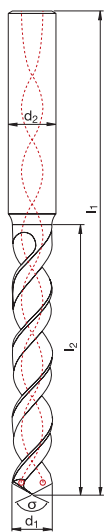


| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | 024 005 ⁶¹⁰ | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | 024 005 ⁶¹⁰ |
|--|------------------------|--|------------------------|----------|------------------------------------|--|------------------------|--|------------------------|----------|------------------------------------|
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1.1-1.6; 2.1-2.4; 3.1-3.4; 4; 5 | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1.1-1.6; 2.1-2.4; 3.1-3.4; 4; 5 |
| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
| 8,6 | 61 | 103 | 10 | 135° | 424 386 H? | 13 | 77 | 124 | 14 | 135° | 424 430 H? |
| 8,7 | 61 | 103 | 10 | 135° | 424 387 H? | 13,5 | 77 | 124 | 14 | 135° | 424 435 H? |
| 8,8 | 61 | 103 | 10 | 135° | 424 388 H? | 13,8 | 77 | 124 | 14 | 135° | 424 438 H? |
| 8,9 | 61 | 103 | 10 | 135° | 424 389 H? | 14 | 77 | 124 | 14 | 135° | 424 440 H? |
| 9 | 61 | 103 | 10 | 135° | 424 390 H? | 14,5 | 83 | 133 | 16 | 135° | 424 445 H? |
| 9,1 | 61 | 103 | 10 | 135° | 424 391 H? | 14,8 | 83 | 133 | 16 | 135° | 424 448 H? |
| 9,2 | 61 | 103 | 10 | 135° | 424 392 H? | 15 | 83 | 133 | 16 | 135° | 424 450 H? |
| 9,3 | 61 | 103 | 10 | 135° | 424 393 H? | 15,5 | 83 | 133 | 16 | 135° | 424 455 H? |
| 9,4 | 61 | 103 | 10 | 135° | 424 394 H? | 15,8 | 83 | 133 | 16 | 135° | 424 458 H? |
| 9,5 | 61 | 103 | 10 | 135° | 424 395 H? | 16 | 83 | 133 | 16 | 135° | 424 460 H? |
| 9,6 | 61 | 103 | 10 | 135° | 424 396 H? | 16,5 | 93 | 143 | 18 | 135° | 424 465 H? |
| 9,7 | 61 | 103 | 10 | 135° | 424 397 H? | 16,8 | 93 | 143 | 18 | 135° | 424 468 H? |
| 9,8 | 61 | 103 | 10 | 135° | 424 398 H? | 17 | 93 | 143 | 18 | 135° | 424 470 H? |
| 9,9 | 61 | 103 | 10 | 135° | 424 399 H? | 17,5 | 93 | 143 | 18 | 135° | 424 475 H? |
| 10 | 61 | 103 | 10 | 135° | 424 400 H? | 17,8 | 93 | 143 | 18 | 135° | 424 478 H? |
| 10,02 | 61 | 103 | 10 | 135° | 424 513 H? | 18 | 93 | 143 | 18 | 135° | 424 480 H? |
| 10,1 | 71 | 118 | 12 | 135° | 424 401 H? | 18,5 | 101 | 153 | 20 | 135° | 424 485 H? |
| 10,2 | 71 | 118 | 12 | 135° | 424 402 H? | 18,8 | 101 | 153 | 20 | 135° | 424 488 H? |
| 10,3 | 71 | 118 | 12 | 135° | 424 403 H? | 19 | 101 | 153 | 20 | 135° | 424 490 H? |
| 10,4 | 71 | 118 | 12 | 135° | 424 404 H? | 19,5 | 101 | 153 | 20 | 135° | 424 495 H? |
| 10,5 | 71 | 118 | 12 | 135° | 424 405 H? | 19,8 | 101 | 153 | 20 | 135° | 424 498 H? |
| 10,6 | 71 | 118 | 12 | 135° | 424 406 H? | 20 | 101 | 153 | 20 | 135° | 424 500 H? |
| 10,7 | 71 | 118 | 12 | 135° | 424 407 H? | | | | | | |
| 10,8 | 71 | 118 | 12 | 135° | 424 408 H? | | | | | | |
| 10,9 | 71 | 118 | 12 | 135° | 424 409 H? | | | | | | |
| 11 | 71 | 118 | 12 | 135° | 424 410 H? | | | | | | |
| 11,1 | 71 | 118 | 12 | 135° | 424 411 H? | | | | | | |
| 11,2 | 71 | 118 | 12 | 135° | 424 412 H? | | | | | | |
| 11,3 | 71 | 118 | 12 | 135° | 424 413 H? | | | | | | |
| 11,4 | 71 | 118 | 12 | 135° | 424 414 H? | | | | | | |
| 11,5 | 71 | 118 | 12 | 135° | 424 415 H? | | | | | | |
| 11,6 | 71 | 118 | 12 | 135° | 424 416 H? | | | | | | |
| 11,7 | 71 | 118 | 12 | 135° | 424 417 H? | | | | | | |
| 11,8 | 71 | 118 | 12 | 135° | 424 418 H? | | | | | | |
| 11,9 | 71 | 118 | 12 | 135° | 424 419 H? | | | | | | |
| 12 | 71 | 118 | 12 | 135° | 424 420 H? | | | | | | |
| 12,02 | 71 | 118 | 12 | 135° | 424 514 H? | | | | | | |
| 12,5 | 77 | 124 | 14 | 135° | 424 425 H? | | | | | | |
| 12,8 | 77 | 124 | 14 | 135° | 424 428 H? | | | | | | |





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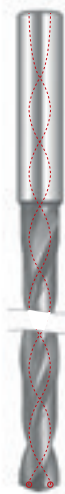
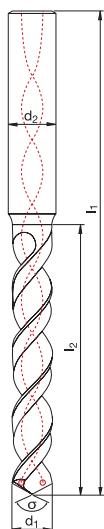
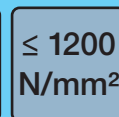
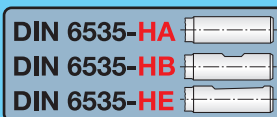
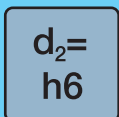
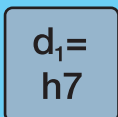
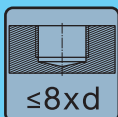


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|---|--|---|---|--|---|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 024 008 ⁶¹⁰ TiAlN | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 024 008 ⁶¹⁰ TiAlN |
|---|--|---|---|--|---|

| | | | | | |
|---|--|---------------------|---|--|---------------------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.6; 2.1-2.4; 5 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1.1-1.6; 2.1-2.4; 5 |
|---|--|---------------------|---|--|---------------------|

| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
|------------------------|------------------------|------------------------|------------------------|----------|-------------------|------------------------|------------------------|------------------------|------------------------|----------|-------------------|
| 3 | 34 | 72 | 6 | 135° | 425 330 H? | 6,9 | 76 | 114 | 8 | 135° | 425 369 H? |
| 3,1 | 34 | 72 | 6 | 135° | 425 331 H? | 7 | 76 | 114 | 8 | 135° | 425 370 H? |
| 3,2 | 34 | 72 | 6 | 135° | 425 332 H? | 7,1 | 76 | 114 | 8 | 135° | 425 371 H? |
| 3,3 | 34 | 72 | 6 | 135° | 425 333 H? | 7,2 | 76 | 114 | 8 | 135° | 425 372 H? |
| 3,4 | 34 | 72 | 6 | 135° | 425 334 H? | 7,3 | 76 | 114 | 8 | 135° | 425 373 H? |
| 3,5 | 34 | 72 | 6 | 135° | 425 335 H? | 7,4 | 76 | 114 | 8 | 135° | 425 374 H? |
| 3,6 | 34 | 72 | 6 | 135° | 425 336 H? | 7,5 | 76 | 114 | 8 | 135° | 425 375 H? |
| 3,7 | 34 | 72 | 6 | 135° | 425 337 H? | 7,6 | 76 | 114 | 8 | 135° | 425 376 H? |
| 3,8 | 43 | 81 | 6 | 135° | 425 338 H? | 7,7 | 76 | 114 | 8 | 135° | 425 377 H? |
| 3,9 | 43 | 81 | 6 | 135° | 425 339 H? | 7,8 | 76 | 114 | 8 | 135° | 425 378 H? |
| 4 | 43 | 81 | 6 | 135° | 425 340 H? | 7,9 | 76 | 114 | 8 | 135° | 425 379 H? |
| 4,1 | 43 | 81 | 6 | 135° | 425 341 H? | 8 | 76 | 114 | 8 | 135° | 425 380 H? |
| 4,2 | 43 | 81 | 6 | 135° | 425 342 H? | 8,1 | 95 | 142 | 10 | 135° | 425 381 H? |
| 4,3 | 43 | 81 | 6 | 135° | 425 343 H? | 8,2 | 95 | 142 | 10 | 135° | 425 382 H? |
| 4,4 | 43 | 81 | 6 | 135° | 425 344 H? | 8,3 | 95 | 142 | 10 | 135° | 425 383 H? |
| 4,5 | 43 | 81 | 6 | 135° | 425 345 H? | 8,4 | 95 | 142 | 10 | 135° | 425 384 H? |
| 4,6 | 43 | 81 | 6 | 135° | 425 346 H? | 8,5 | 95 | 142 | 10 | 135° | 425 385 H? |
| 4,7 | 43 | 81 | 6 | 135° | 425 347 H? | 8,6 | 95 | 142 | 10 | 135° | 425 386 H? |
| 4,8 | 57 | 95 | 6 | 135° | 425 348 H? | 8,7 | 95 | 142 | 10 | 135° | 425 387 H? |
| 4,9 | 57 | 95 | 6 | 135° | 425 349 H? | 8,8 | 95 | 142 | 10 | 135° | 425 388 H? |
| 5 | 57 | 95 | 6 | 135° | 425 350 H? | 8,9 | 95 | 142 | 10 | 135° | 425 389 H? |
| 5,1 | 57 | 95 | 6 | 135° | 425 351 H? | 9 | 95 | 142 | 10 | 135° | 425 390 H? |
| 5,2 | 57 | 95 | 6 | 135° | 425 352 H? | 9,1 | 95 | 142 | 10 | 135° | 425 391 H? |
| 5,3 | 57 | 95 | 6 | 135° | 425 353 H? | 9,2 | 95 | 142 | 10 | 135° | 425 392 H? |
| 5,4 | 57 | 95 | 6 | 135° | 425 354 H? | 9,3 | 95 | 142 | 10 | 135° | 425 393 H? |
| 5,5 | 57 | 95 | 6 | 135° | 425 355 H? | 9,4 | 95 | 142 | 10 | 135° | 425 394 H? |
| 5,6 | 57 | 95 | 6 | 135° | 425 356 H? | 9,5 | 95 | 142 | 10 | 135° | 425 395 H? |
| 5,7 | 57 | 95 | 6 | 135° | 425 357 H? | 9,6 | 95 | 142 | 10 | 135° | 425 396 H? |
| 5,8 | 57 | 95 | 6 | 135° | 425 358 H? | 9,7 | 95 | 142 | 10 | 135° | 425 397 H? |
| 5,9 | 57 | 95 | 6 | 135° | 425 359 H? | 9,8 | 95 | 142 | 10 | 135° | 425 398 H? |
| 6 | 57 | 95 | 6 | 135° | 425 360 H? | 9,9 | 95 | 142 | 10 | 135° | 425 399 H? |
| 6,1 | 76 | 114 | 8 | 135° | 425 361 H? | 10 | 95 | 142 | 10 | 135° | 425 400 H? |
| 6,2 | 76 | 114 | 8 | 135° | 425 362 H? | 10,1 | 114 | 162 | 12 | 135° | 425 401 H? |
| 6,3 | 76 | 114 | 8 | 135° | 425 363 H? | 10,2 | 114 | 162 | 12 | 135° | 425 402 H? |
| 6,4 | 76 | 114 | 8 | 135° | 425 364 H? | 10,3 | 114 | 162 | 12 | 135° | 425 403 H? |
| 6,5 | 76 | 114 | 8 | 135° | 425 365 H? | 10,4 | 114 | 162 | 12 | 135° | 425 404 H? |
| 6,6 | 76 | 114 | 8 | 135° | 425 366 H? | 10,5 | 114 | 162 | 12 | 135° | 425 405 H? |
| 6,7 | 76 | 114 | 8 | 135° | 425 367 H? | 10,6 | 114 | 162 | 12 | 135° | 425 406 H? |
| 6,8 | 76 | 114 | 8 | 135° | 425 368 H? | 10,7 | 114 | 162 | 12 | 135° | 425 407 H? |





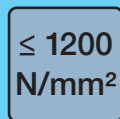
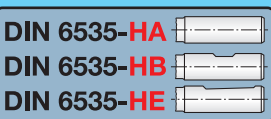
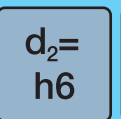
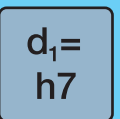
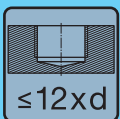
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Katalog-Nr. ^{W%} Catalogue no. ^{W%} **024 008**⁶¹⁰
 Catalogue n° ^{W%} Nr. di catalogo ^{W%} **TiAlN**

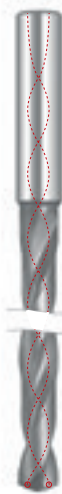
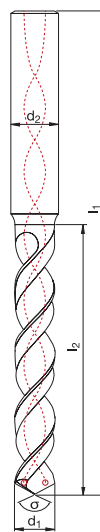
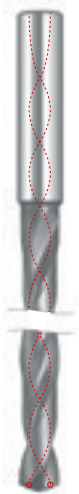
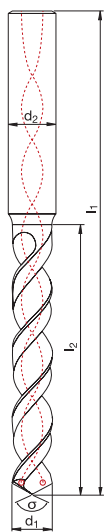
Werkstoffgruppen Classification of work materials
 Groupes de matières Gruppo materiali 1.1-1.6; 2.1-2.4; 5

| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
|------------------------|------------------------|------------------------|------------------------|----------|-------------------|
| 10,8 | 114 | 162 | 12 | 135° | 425 408 H? |
| 10,9 | 114 | 162 | 12 | 135° | 425 409 H? |
| 11 | 114 | 162 | 12 | 135° | 425 410 H? |
| 11,1 | 114 | 162 | 12 | 135° | 425 411 H? |
| 11,2 | 114 | 162 | 12 | 135° | 425 412 H? |
| 11,3 | 114 | 162 | 12 | 135° | 425 413 H? |
| 11,4 | 114 | 162 | 12 | 135° | 425 414 H? |
| 11,5 | 114 | 162 | 12 | 135° | 425 415 H? |
| 11,6 | 114 | 162 | 12 | 135° | 425 416 H? |
| 11,7 | 114 | 162 | 12 | 135° | 425 417 H? |
| 11,8 | 114 | 162 | 12 | 135° | 425 418 H? |
| 11,9 | 114 | 162 | 12 | 135° | 425 419 H? |
| 12 | 114 | 162 | 12 | 135° | 425 420 H? |
| 12,5 | 133 | 178 | 14 | 135° | 425 425 H? |
| 12,8 | 133 | 178 | 14 | 135° | 425 428 H? |
| 13 | 133 | 178 | 14 | 135° | 425 430 H? |
| 13,5 | 133 | 178 | 14 | 135° | 425 435 H? |
| 13,8 | 133 | 178 | 14 | 135° | 425 438 H? |
| 14 | 133 | 178 | 14 | 135° | 425 440 H? |
| 14,5 | 152 | 203 | 16 | 135° | 425 445 H? |
| 14,8 | 152 | 203 | 16 | 135° | 425 448 H? |
| 15 | 152 | 203 | 16 | 135° | 425 450 H? |
| 15,5 | 152 | 203 | 16 | 135° | 425 455 H? |
| 15,8 | 152 | 203 | 16 | 135° | 425 458 H? |
| 16 | 152 | 203 | 16 | 135° | 425 460 H? |
| 16,5 | 171 | 222 | 18 | 135° | 425 465 H? |
| 16,8 | 171 | 222 | 18 | 135° | 425 468 H? |
| 17 | 171 | 222 | 18 | 135° | 425 470 H? |
| 17,5 | 171 | 222 | 18 | 135° | 425 475 H? |
| 17,8 | 171 | 222 | 18 | 135° | 425 478 H? |
| 18 | 171 | 222 | 18 | 135° | 425 480 H? |
| 18,5 | 190 | 243 | 20 | 135° | 425 485 H? |
| 18,8 | 190 | 243 | 20 | 135° | 425 488 H? |
| 19 | 190 | 243 | 20 | 135° | 425 490 H? |
| 19,5 | 190 | 243 | 20 | 135° | 425 495 H? |
| 19,8 | 190 | 243 | 20 | 135° | 425 498 H? |
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Katalog-Nr. ^{W%}
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Nr. di catalogo ^{W%}

024 012⁶¹⁰
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Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

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Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

1.1-1.6; 2.1-2.4; 5

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

1.1-1.6; 2.1-2.4; 5

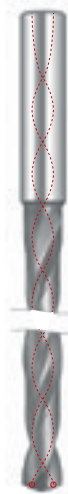
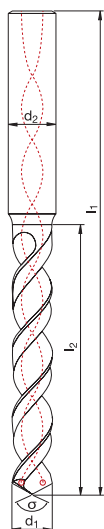
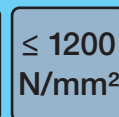
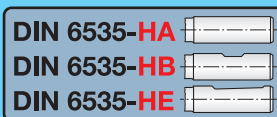
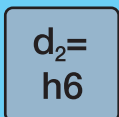
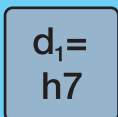
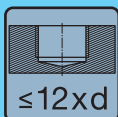
d₁ [mm] l₂ [mm] l₁ [mm] d₂ [mm] σ [°]

Code

d₁ [mm] l₂ [mm] l₁ [mm] d₂ [mm] σ [°]

Code

| | | | | | | | | | | | |
|-----|-----|-----|---|------|------------------|------|-----|-----|----|------|------------------|
| 3 | 54 | 92 | 6 | 135° | 426330 H? | 6,9 | 108 | 146 | 8 | 135° | 426369 H? |
| 3,1 | 54 | 92 | 6 | 135° | 426331 H? | 7 | 108 | 146 | 8 | 135° | 426370 H? |
| 3,2 | 54 | 92 | 6 | 135° | 426332 H? | 7,1 | 108 | 146 | 8 | 135° | 426371 H? |
| 3,3 | 54 | 92 | 6 | 135° | 426333 H? | 7,2 | 108 | 146 | 8 | 135° | 426372 H? |
| 3,4 | 54 | 92 | 6 | 135° | 426334 H? | 7,3 | 108 | 146 | 8 | 135° | 426373 H? |
| 3,5 | 54 | 92 | 6 | 135° | 426335 H? | 7,4 | 108 | 146 | 8 | 135° | 426374 H? |
| 3,6 | 54 | 92 | 6 | 135° | 426336 H? | 7,5 | 108 | 146 | 8 | 135° | 426375 H? |
| 3,7 | 54 | 92 | 6 | 135° | 426337 H? | 7,6 | 108 | 146 | 8 | 135° | 426376 H? |
| 3,8 | 64 | 102 | 6 | 135° | 426338 H? | 7,7 | 108 | 146 | 8 | 135° | 426377 H? |
| 3,9 | 64 | 102 | 6 | 135° | 426339 H? | 7,8 | 108 | 146 | 8 | 135° | 426378 H? |
| 4 | 64 | 102 | 6 | 135° | 426340 H? | 7,9 | 108 | 146 | 8 | 135° | 426379 H? |
| 4,1 | 64 | 102 | 6 | 135° | 426341 H? | 8 | 108 | 146 | 8 | 135° | 426380 H? |
| 4,2 | 64 | 102 | 6 | 135° | 426342 H? | 8,1 | 120 | 162 | 10 | 135° | 426381 H? |
| 4,3 | 64 | 102 | 6 | 135° | 426343 H? | 8,2 | 120 | 162 | 10 | 135° | 426382 H? |
| 4,4 | 64 | 102 | 6 | 135° | 426344 H? | 8,3 | 120 | 162 | 10 | 135° | 426383 H? |
| 4,5 | 64 | 102 | 6 | 135° | 426345 H? | 8,4 | 120 | 162 | 10 | 135° | 426384 H? |
| 4,6 | 64 | 102 | 6 | 135° | 426346 H? | 8,5 | 120 | 162 | 10 | 135° | 426385 H? |
| 4,7 | 64 | 102 | 6 | 135° | 426347 H? | 8,6 | 120 | 162 | 10 | 135° | 426386 H? |
| 4,8 | 78 | 116 | 6 | 135° | 426348 H? | 8,7 | 120 | 162 | 10 | 135° | 426387 H? |
| 4,9 | 78 | 116 | 6 | 135° | 426349 H? | 8,8 | 120 | 162 | 10 | 135° | 426388 H? |
| 5 | 78 | 116 | 6 | 135° | 426350 H? | 8,9 | 120 | 162 | 10 | 135° | 426389 H? |
| 5,1 | 78 | 116 | 6 | 135° | 426351 H? | 9 | 120 | 162 | 10 | 135° | 426390 H? |
| 5,2 | 78 | 116 | 6 | 135° | 426352 H? | 9,1 | 120 | 162 | 10 | 135° | 426391 H? |
| 5,3 | 78 | 116 | 6 | 135° | 426353 H? | 9,2 | 120 | 162 | 10 | 135° | 426392 H? |
| 5,4 | 78 | 116 | 6 | 135° | 426354 H? | 9,3 | 120 | 162 | 10 | 135° | 426393 H? |
| 5,5 | 78 | 116 | 6 | 135° | 426355 H? | 9,4 | 120 | 162 | 10 | 135° | 426394 H? |
| 5,6 | 78 | 116 | 6 | 135° | 426356 H? | 9,5 | 120 | 162 | 10 | 135° | 426395 H? |
| 5,7 | 78 | 116 | 6 | 135° | 426357 H? | 9,6 | 120 | 162 | 10 | 135° | 426396 H? |
| 5,8 | 78 | 116 | 6 | 135° | 426358 H? | 9,7 | 120 | 162 | 10 | 135° | 426397 H? |
| 5,9 | 78 | 116 | 6 | 135° | 426359 H? | 9,8 | 120 | 162 | 10 | 135° | 426398 H? |
| 6 | 78 | 116 | 6 | 135° | 426360 H? | 9,9 | 120 | 162 | 10 | 135° | 426399 H? |
| 6,1 | 108 | 146 | 8 | 135° | 426361 H? | 10 | 120 | 162 | 10 | 135° | 426400 H? |
| 6,2 | 108 | 146 | 8 | 135° | 426362 H? | 10,1 | 156 | 204 | 12 | 135° | 426401 H? |
| 6,3 | 108 | 146 | 8 | 135° | 426363 H? | 10,2 | 156 | 204 | 12 | 135° | 426402 H? |
| 6,4 | 108 | 146 | 8 | 135° | 426364 H? | 10,3 | 156 | 204 | 12 | 135° | 426403 H? |
| 6,5 | 108 | 146 | 8 | 135° | 426365 H? | 10,4 | 156 | 204 | 12 | 135° | 426404 H? |
| 6,6 | 108 | 146 | 8 | 135° | 426366 H? | 10,5 | 156 | 204 | 12 | 135° | 426405 H? |
| 6,7 | 108 | 146 | 8 | 135° | 426367 H? | 10,6 | 156 | 204 | 12 | 135° | 426406 H? |
| 6,8 | 108 | 146 | 8 | 135° | 426368 H? | 10,7 | 156 | 204 | 12 | 135° | 426407 H? |



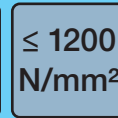
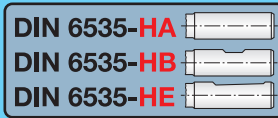
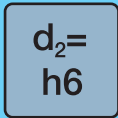
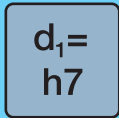
VHM

Katalog-Nr. ^{W%} Catalogue no. ^{W%} **024 012⁶¹⁰**
 Catalogue n° ^{W%} Nr. di catalogo ^{W%} **TiAlN**

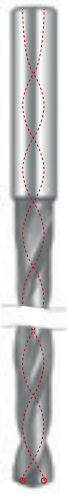
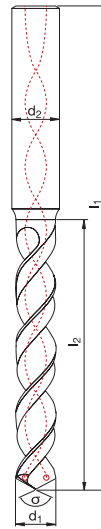
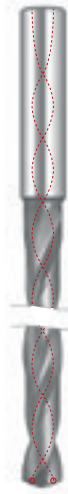
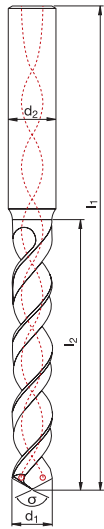
Werkstoffgruppen Classification of work materials
 Groupes de matières Gruppo materiali 1.1-1.6; 2.1-2.4; 5

| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
|------------------------|------------------------|------------------------|------------------------|----------|-------------------|
| 10,8 | 156 | 204 | 12 | 135° | 426 408 H? |
| 10,9 | 156 | 204 | 12 | 135° | 426 409 H? |
| 11 | 156 | 204 | 12 | 135° | 426 410 H? |
| 11,1 | 156 | 204 | 12 | 135° | 426 411 H? |
| 11,2 | 156 | 204 | 12 | 135° | 426 412 H? |
| 11,3 | 156 | 204 | 12 | 135° | 426 413 H? |
| 11,4 | 156 | 204 | 12 | 135° | 426 414 H? |
| 11,5 | 156 | 204 | 12 | 135° | 426 415 H? |
| 11,6 | 156 | 204 | 12 | 135° | 426 416 H? |
| 11,7 | 156 | 204 | 12 | 135° | 426 417 H? |
| 11,8 | 156 | 204 | 12 | 135° | 426 418 H? |
| 11,9 | 156 | 204 | 12 | 135° | 426 419 H? |
| 12 | 156 | 204 | 12 | 135° | 426 420 H? |
| 12,5 | 182 | 230 | 14 | 135° | 426 425 H? |
| 12,8 | 182 | 230 | 14 | 135° | 426 428 H? |
| 13 | 182 | 230 | 14 | 135° | 426 430 H? |
| 13,5 | 182 | 230 | 14 | 135° | 426 435 H? |
| 13,8 | 182 | 230 | 14 | 135° | 426 438 H? |
| 14 | 182 | 230 | 14 | 135° | 426 440 H? |
| 14,5 | 208 | 260 | 16 | 135° | 426 445 H? |
| 14,8 | 208 | 260 | 16 | 135° | 426 448 H? |
| 15 | 208 | 260 | 16 | 135° | 426 450 H? |
| 15,5 | 208 | 260 | 16 | 135° | 426 455 H? |
| 15,8 | 208 | 260 | 16 | 135° | 426 458 H? |
| 16 | 208 | 260 | 16 | 135° | 426 460 H? |
| 16,5 | 234 | 285 | 18 | 135° | 426 465 H? |
| 16,8 | 234 | 285 | 18 | 135° | 426 468 H? |
| 17 | 234 | 285 | 18 | 135° | 426 470 H? |
| 17,5 | 234 | 285 | 18 | 135° | 426 475 H? |
| 17,8 | 234 | 285 | 18 | 135° | 426 478 H? |
| 18 | 234 | 285 | 18 | 135° | 426 480 H? |
| 18,5 | 258 | 310 | 20 | 135° | 426 485 H? |
| 18,8 | 258 | 310 | 20 | 135° | 426 488 H? |
| 19 | 258 | 310 | 20 | 135° | 426 490 H? |
| 19,5 | 258 | 310 | 20 | 135° | 426 495 H? |
| 19,8 | 258 | 310 | 20 | 135° | 426 498 H? |
| 20 | 258 | 310 | 20 | 135° | 426 500 H? |





VHM



Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

025 020⁶¹⁰
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Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

025 030⁶¹⁰
TiAlN

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

1.1-1.5;
1.6.1-1.6.5;
2.1-2.3

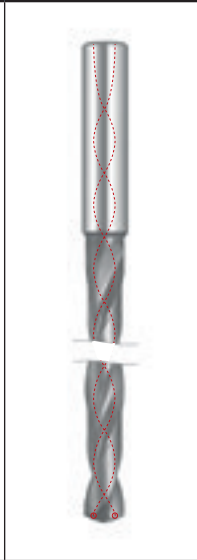
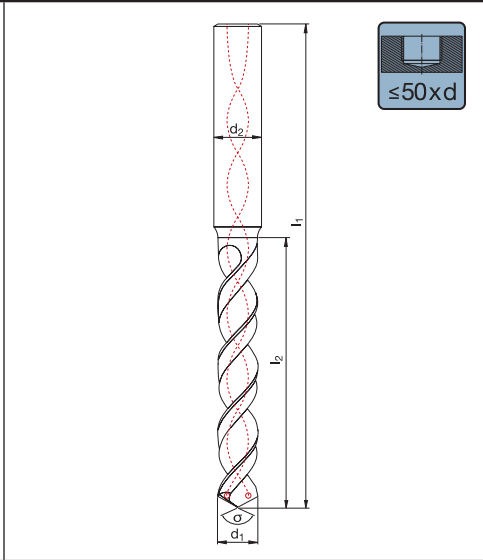
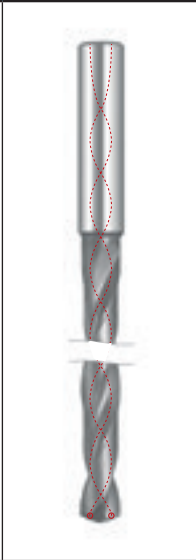
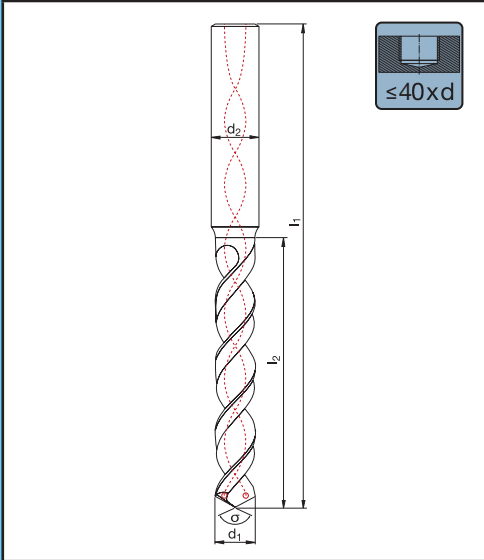
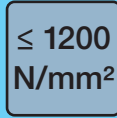
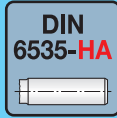
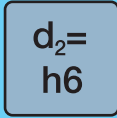
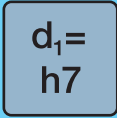
Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

1.1-1.5;
1.6.1-1.6.5;
2.1-2.3

| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
|------------------------|------------------------|------------------------|------------------------|----------|------------------|
| 3 | 80 | 120 | 6 | 135° | 427200 H? |
| 3,5 | 80 | 120 | 6 | 135° | 427201 H? |
| 4 | 90 | 130 | 6 | 135° | 427202 H? |
| 4,5 | 110 | 160 | 6 | 135° | 427203 H? |
| 5 | 120 | 160 | 6 | 135° | 427204 H? |
| 5,5 | 140 | 185 | 6 | 135° | 427205 H? |
| 6 | 140 | 185 | 6 | 135° | 427206 H? |
| 6,5 | 155 | 210 | 8 | 135° | 427207 H? |
| 7 | 160 | 210 | 8 | 135° | 427208 H? |
| 8 | 180 | 230 | 8 | 135° | 427209 H? |
| 8,5 | 195 | 260 | 10 | 135° | 427210 H? |
| 10 | 230 | 290 | 10 | 135° | 427211 H? |
| 12 | 270 | 315 | 12 | 135° | 427212 H? |

| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
|------------------------|------------------------|------------------------|------------------------|----------|------------------|
| 3 | 105 | 150 | 6 | 135° | 427300 H? |
| 4 | 135 | 185 | 6 | 135° | 427301 H? |
| 5 | 165 | 215 | 6 | 135° | 427302 H? |
| 5,5 | 180 | 230 | 6 | 135° | 427303 H? |
| 6 | 180 | 230 | 6 | 135° | 427304 H? |
| 6,5 | 215 | 280 | 8 | 135° | 427305 H? |
| 7 | 230 | 280 | 8 | 135° | 427306 H? |
| 8 | 265 | 315 | 8 | 135° | 427307 H? |
| 10 | 330 | 380 | 10 | 135° | 427308 H? |
| 12 | 380 | 430 | 12 | 135° | 427309 H? |





Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

025 040⁶¹⁰
TiAlN

Katalog-Nr. ^{W%}
Catalogue no. ^{W%}
Catalogue n^o ^{W%}
Nr. di catalogo ^{W%}

025 050⁶¹⁰
TiAlN

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

1.1-1.5;
1.6.1-1.6.5;
2.1-2.3

Werkstoffgruppen
Groupes de matières
Classification of work materials
Gruppo materiali

1.1-1.5;
1.6.1-1.6.5;
2.1-2.3

| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
|------------------------|------------------------|------------------------|------------------------|----------|------------|
| 3 | 150 | 195 | 6 | 135° | 427 400 HA |
| 4 | 175 | 220 | 6 | 135° | 427 401 HA |
| 5 | 230 | 275 | 6 | 135° | 427 405 HA |
| 6 | 260 | 305 | 6 | 135° | 427 408 HA |
| 7 | 300 | 345 | 8 | 135° | 427 411 HA |
| 8 | 340 | 385 | 8 | 135° | 427 414 HA |
| 9 | 380 | 430 | 10 | 135° | 427 417 HA |

| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | σ [°] | Code |
|------------------------|------------------------|------------------------|------------------------|----------|------------|
| 3 | 175 | 220 | 6 | 135° | 427 500 HA |
| 4 | 220 | 265 | 6 | 135° | 427 501 HA |
| 5 | 275 | 320 | 6 | 135° | 427 505 HA |
| 6 | 315 | 355 | 6 | 135° | 427 508 HA |
| 7 | 380 | 425 | 8 | 135° | 427 511 HA |





| 527 000 527 100 | | | | | | | | | | | | | | | | | |
|------------------------|--|----------------------|-----------|----------------------|-----------|----------------------|-----------|----------------------|-----------|----------------------|-----------|----------------------|-----------|----------------------|-----------|----------------------|-----------|
| MAT | | 1.1 / 1.2.2 / 1.2.4 | | 1.2.1 / 1.3 | | 1.2.3 | | 1.4 / 1.5 | | 1.6.1 / 1.6.2 | | 1.6.3 / 1.6.4 | | 1.6.5 | | 1.6.6 | |
| | | 32 ~ 40 m/min | | 20 ~ 25 m/min | | 50 ~ 60 m/min | | 18 ~ 22 m/min | | 13 ~ 18 m/min | | 15 ~ 20 m/min | | 15 ~ 20 m/min | | 8 ~ 12 m/min | |
| $d_1 \varnothing$ [mm] | | n | f | n | f | n | f | n | f | n | f | n | f | n | f | n | f |
| | | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] |
| 1 | | 11.460 | 0,02~0,05 | 7.160 | 0,03~0,05 | 17.510 | 0,03~0,05 | 6.370 | 0,03~0,05 | 4.930 | 0,02~0,04 | 5.570 | 0,01~0,03 | 5.570 | 0,02~0,04 | 3.180 | 0,01~0,03 |
| 2 | | 5.730 | 0,06~0,09 | 3.580 | 0,06~0,09 | 8.750 | 0,06~0,09 | 3.180 | 0,06~0,09 | 2.470 | 0,05~0,07 | 2.790 | 0,03~0,05 | 2.790 | 0,05~0,07 | 1.590 | 0,03~0,05 |
| 3 | | 3.820 | 0,10~0,13 | 2.390 | 0,09~0,13 | 5.840 | 0,09~0,13 | 2.120 | 0,09~0,13 | 1.640 | 0,06~0,09 | 1.860 | 0,04~0,06 | 1.860 | 0,06~0,09 | 1.060 | 0,04~0,06 |
| 4 | | 2.860 | 0,11~0,15 | 1.790 | 0,11~0,15 | 4.380 | 0,11~0,15 | 1.590 | 0,11~0,15 | 1.230 | 0,08~0,12 | 1.390 | 0,06~0,08 | 1.390 | 0,08~0,12 | 800 | 0,06~0,08 |
| 5 | | 2.290 | 0,12~0,18 | 1.430 | 0,12~0,18 | 3.500 | 0,12~0,18 | 1.270 | 0,12~0,18 | 990 | 0,10~0,15 | 1.110 | 0,08~0,10 | 1.110 | 0,10~0,15 | 640 | 0,08~0,10 |
| 6 | | 1.910 | 0,13~0,19 | 1.190 | 0,13~0,19 | 2.920 | 0,13~0,19 | 1.060 | 0,13~0,19 | 820 | 0,12~0,18 | 930 | 0,09~0,12 | 930 | 0,15~0,18 | 530 | 0,09~0,12 |
| 8 | | 1.430 | 0,17~0,24 | 900 | 0,17~0,24 | 2.190 | 0,17~0,24 | 800 | 0,17~0,24 | 620 | 0,16~0,24 | 700 | 0,12~0,16 | 700 | 0,20~0,24 | 400 | 0,12~0,16 |
| 10 | | 1.150 | 0,20~0,28 | 720 | 0,20~0,28 | 1.750 | 0,20~0,28 | 640 | 0,20~0,28 | 490 | 0,20~0,28 | 560 | 0,15~0,20 | 560 | 0,25~0,30 | 320 | 0,15~0,20 |
| 12 | | 950 | 0,24~0,34 | 600 | 0,24~0,34 | 1.460 | 0,24~0,34 | 530 | 0,24~0,34 | 410 | 0,24~0,34 | 460 | 0,18~0,24 | 460 | 0,30~0,36 | 270 | 0,18~0,24 |
| 13 | | 880 | 0,26~0,36 | 550 | 0,26~0,36 | 1.350 | 0,26~0,36 | 490 | 0,26~0,36 | 380 | 0,26~0,36 | 430 | 0,20~0,26 | 430 | 0,32~0,40 | 240 | 0,20~0,26 |
| 14 | | 820 | 0,27~0,39 | 510 | 0,28~0,39 | 1.250 | 0,28~0,39 | 450 | 0,28~0,39 | 350 | 0,28~0,39 | 400 | 0,21~0,30 | 400 | 0,35~0,45 | 230 | 0,21~0,30 |
| 15 | | 760 | 0,28~0,42 | 480 | 0,29~0,41 | 1.170 | 0,29~0,41 | 420 | 0,29~0,41 | 330 | 0,29~0,40 | 370 | 0,22~0,31 | 370 | 0,36~0,48 | 210 | 0,22~0,31 |
| 16 | | 720 | 0,29~0,43 | 450 | 0,30~0,43 | 1.090 | 0,30~0,43 | 400 | 0,30~0,43 | 310 | 0,30~0,43 | 350 | 0,23~0,32 | 350 | 0,37~0,50 | 200 | 0,23~0,32 |
| 17 | | 670 | 0,30~0,46 | 420 | 0,32~0,46 | 1.030 | 0,32~0,46 | 370 | 0,32~0,46 | 290 | 0,31~0,45 | 330 | 0,24~0,34 | 330 | 0,38~0,52 | 190 | 0,24~0,34 |
| 18 | | 640 | 0,32~0,49 | 400 | 0,34~0,49 | 970 | 0,34~0,49 | 350 | 0,34~0,49 | 270 | 0,32~0,47 | 310 | 0,25~0,36 | 310 | 0,39~0,54 | 180 | 0,25~0,36 |
| 19 | | 600 | 0,33~0,51 | 380 | 0,35~0,50 | 920 | 0,35~0,50 | 340 | 0,35~0,50 | 260 | 0,33~0,48 | 290 | 0,25~0,38 | 290 | 0,40~0,55 | 170 | 0,25~0,38 |
| 20 | | 570 | 0,34~0,52 | 360 | 0,36~0,50 | 880 | 0,36~0,50 | 320 | 0,36~0,50 | 250 | 0,34~0,50 | 280 | 0,26~0,40 | 280 | 0,40~0,56 | 160 | 0,26~0,40 |

Als Kühlmittel sollte Emulsion verwendet werden.
As coolant please use emulsion.
Il est nécessaire de lubrifier avec de l'émulsion.
Il lubrificante consigliato e' l'emulsione.





▶ Die Schnittdaten sind wie folgt zu reduzieren:
▶ The cutting data must be reduced as follows:
▶ Il faut réduire les paramètres comme suit:
▶ Ridurre i parametri come segue:


| | | | |
|--|-------|-------|-------|
| Bohrungstiefe · Depth of hole · Profondeur de perçage · Profondità di foratura | 4 x d | 5 x d | 6 x d |
| Schnittgeschwindigkeit · Cutting speed · Vitesse de coupe · Velocità di taglio | x 1,0 | x 0,9 | x 0,8 |

▶ Bei Bohrtiefen ≤ 4 x d ist kein Entspannen notwendig. Bei größeren Bohrtiefen sollte entspannt werden.
▶ In case of drilling ≤ 4 x d, step feed drilling is not necessary. If the drilling depth is > 4 x d, step feed drilling is recommended.
▶ En perçant ≤ 4 x d il n'est pas nécessaire de débourrer. En perçant plus profond il est indispensable de débourrer.
▶ Nel caso di forature ≤ 4 x d, non e' necessario scaricare il truciolo. Nel caso di forature > 4 x d, si consiglia di scaricare il truciolo.

| 527 000 527 100 | | HSSE | Typ UNI | ≤3xd | ≤5xd | TiAIN | | | |
|--|---------------------------------|---------------------------------|---------------------------------|--|---------------------------------|-------|--|--|--|
| MAT | 320-325 | 2.1-2.3 | 3.1-3.3 | 4.1 / 4.2 | 4.3-4.5 | | | | |
| V _c | | 32 ~ 40 m/min | 25 ~ 50 m/min | 32 ~ 63 m/min | 63 ~ 100 m/min | | | | |
| d ₁ Ø [mm] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | | | | |
| 1 | 11.460 0,03~0,05 | 11.940 0,01~0,03 | 14.320 0,02~0,06 | 25.460 0,02~0,06 | | | | | |
| 2 | 5.730 0,08~0,11 | 5.970 0,04~0,06 | 7.160 0,04~0,12 | 12.730 0,04~0,12 | | | | | |
| 3 | 3.820 0,11~0,16 | 3.980 0,06~0,09 | 4.770 0,06~0,18 | 8.490 0,06~0,18 | | | | | |
| 4 | 2.860 0,13~0,19 | 2.980 0,08~0,11 | 3.580 0,08~0,24 | 6.370 0,08~0,24 | | | | | |
| 5 | 2.290 0,16~0,22 | 2.390 0,10~0,13 | 2.860 0,10~0,30 | 5.090 0,10~0,30 | | | | | |
| 6 | 1.910 0,19~0,26 | 1.990 0,12~0,15 | 2.390 0,12~0,36 | 4.240 0,12~0,36 | | | | | |
| 8 | 1.430 0,21~0,30 | 1.490 0,16~0,20 | 1.790 0,16~0,45 | 3.180 0,16~0,45 | | | | | |
| 10 | 1.150 0,25~0,35 | 1.190 0,20~0,25 | 1.430 0,20~0,55 | 2.550 0,20~0,55 | | | | | |
| 12 | 950 0,30~0,42 | 990 0,24~0,30 | 1.190 0,24~0,66 | 2.120 0,24~0,66 | | | | | |
| 13 | 880 0,31~0,42 | 920 0,26~0,32 | 1.100 0,25~0,72 | 1.960 0,25~0,72 | | | | | |
| 14 | 820 0,32~0,44 | 850 0,26~0,32 | 1.020 0,27~0,74 | 1.820 0,27~0,74 | | | | | |
| 15 | 760 0,33~0,45 | 800 0,26~0,34 | 950 0,29~0,80 | 1.700 0,29~0,80 | | | | | |
| 16 | 720 0,34~0,46 | 750 0,27~0,36 | 900 0,30~0,83 | 1.590 0,30~0,83 | | | | | |
| 17 | 670 0,35~0,48 | 700 0,28~0,37 | 840 0,31~0,88 | 1.500 0,31~0,88 | | | | | |
| 18 | 640 0,36~0,50 | 660 0,29~0,41 | 800 0,32~0,94 | 1.410 0,32~0,94 | | | | | |
| 19 | 600 0,38~0,53 | 630 0,30~0,43 | 750 0,34~0,97 | 1.340 0,34~0,97 | | | | | |
| 20 | 570 0,40~0,56 | 600 0,30~0,44 | 720 0,36~1,00 | 1.270 0,36~1,00 | | | | | |
| <p> Als Kühlmittel sollte Emulsion verwendet werden. As coolant please use emulsion. Il est nécessaire de lubrifier avec de l'émulsion. Il lubrificante consigliato e' l'emulsione.</p> | | | | | | | | | |
| <p>▶ Die Schnittdaten sind wie folgt zu reduzieren: ▶ The cutting data must be reduced as follows: ▶ Il faut réduire les paramètres comme suit: ▶ Ridurre i parametri come segue:</p> | | | | | | | | | |
| Bohrungstiefe · Depth of hole · Profondeur de perçage · Profondità di foratura | | | | 4 x d | 5 x d | 6 x d | | | |
| Schnittgeschwindigkeit · Cutting speed · Vitesse de coupe · Velocità di taglio | | | |  x 1,0 | x 0,9 | x 0,8 | | | |
| <p>▶ Bei Bohrtiefen ≤ 4 x d ist kein Entspannen notwendig. Bei größeren Bohrtiefen sollte entspannt werden. ▶ In case of drilling ≤ 4 x d, step feed drilling is not necessary. If the drilling depth is > 4 x d, step feed drilling is recommended. ▶ En perçant ≤ 4 x d il n'est pas nécessaire de débouurrer. En perçant plus profond il est indispensable de débouurrer. ▶ Nel caso di forature ≤ 4 x d, non e' necessario scaricare il truciolo. Nel caso di forature > 4 x d, si consiglia di scaricare il truciolo.</p> | | | | | | | | | |




| 529 000 529 100 | | HSSE V3 | | Typ UNI | | ≤3xd | | ≤5xd | | TiN | |  | | | | | |
|--|---|---------------------|----------------------|---------------|----------------------|---------------|----------------------|---------------|----------------------|---------------|----------------------|---|----------------------|---------------|----------------------|---------------|--|
| MAT |  | 1.1 / 1.2.2 / 1.2.4 | | 1.2.1 / 1.3 | | 1.2.3 | | 1.4 / 1.5 | | 1.6.1 / 1.6.2 | | 1.6.3 / 1.6.4 | | 1.6.5 | | 1.6.6 | |
|  | 32 ~ 40 m/min | | 20 ~ 25 m/min | | 50 ~ 60 m/min | | 18 ~ 22 m/min | | 13 ~ 18 m/min | | 15 ~ 20 m/min | | 15 ~ 20 m/min | | 8 ~ 12 m/min | | |
| d ₁  | n | f | n | f | n | f | n | f | n | f | n | f | n | f | n | f | |
| [mm] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | |
| 1 | 11.460 | 0,02~ 0,05 | 7.160 | 0,03~ 0,05 | 17.510 | 0,03~ 0,05 | 6.370 | 0,03~ 0,05 | 4.930 | 0,02~ 0,04 | 5.570 | 0,01~ 0,03 | 5.570 | 0,02~ 0,04 | 3.180 | 0,01~ 0,03 | |
| 2 | 5.730 | 0,06~ 0,09 | 3.580 | 0,06~ 0,09 | 8.750 | 0,06~ 0,09 | 3.180 | 0,06~ 0,09 | 2.470 | 0,05~ 0,07 | 2.790 | 0,03~ 0,05 | 2.790 | 0,05~ 0,07 | 1.590 | 0,03~ 0,05 | |
| 3 | 3.820 | 0,10~ 0,13 | 2.390 | 0,09~ 0,13 | 5.840 | 0,09~ 0,13 | 2.120 | 0,09~ 0,13 | 1.640 | 0,06~ 0,09 | 1.860 | 0,04~ 0,06 | 1.860 | 0,06~ 0,09 | 1.060 | 0,04~ 0,06 | |
| 4 | 2.860 | 0,11~ 0,15 | 1.790 | 0,11~ 0,15 | 4.380 | 0,11~ 0,15 | 1.590 | 0,11~ 0,15 | 1.230 | 0,08~ 0,12 | 1.390 | 0,06~ 0,08 | 1.390 | 0,08~ 0,12 | 800 | 0,06~ 0,08 | |
| 5 | 2.290 | 0,12~ 0,18 | 1.430 | 0,12~ 0,18 | 3.500 | 0,12~ 0,18 | 1.270 | 0,12~ 0,18 | 990 | 0,10~ 0,15 | 1.110 | 0,08~ 0,10 | 1.110 | 0,10~ 0,15 | 640 | 0,08~ 0,10 | |
| 6 | 1.910 | 0,13~ 0,19 | 1.190 | 0,13~ 0,19 | 2.920 | 0,13~ 0,19 | 1.060 | 0,13~ 0,19 | 820 | 0,12~ 0,18 | 930 | 0,09~ 0,12 | 930 | 0,15~ 0,18 | 530 | 0,09~ 0,12 | |
| 8 | 1.430 | 0,17~ 0,24 | 900 | 0,17~ 0,24 | 2.190 | 0,17~ 0,24 | 800 | 0,17~ 0,24 | 620 | 0,16~ 0,24 | 700 | 0,12~ 0,16 | 700 | 0,20~ 0,24 | 400 | 0,12~ 0,16 | |
| 10 | 1.150 | 0,20~ 0,28 | 720 | 0,20~ 0,28 | 1.750 | 0,20~ 0,28 | 640 | 0,20~ 0,28 | 490 | 0,20~ 0,28 | 560 | 0,15~ 0,20 | 560 | 0,25~ 0,30 | 320 | 0,15~ 0,20 | |
| 12 | 950 | 0,24~ 0,34 | 600 | 0,24~ 0,34 | 1.460 | 0,24~ 0,34 | 530 | 0,24~ 0,34 | 410 | 0,24~ 0,34 | 460 | 0,18~ 0,24 | 460 | 0,30~ 0,36 | 270 | 0,18~ 0,24 | |
| 13 | 880 | 0,26~ 0,36 | 550 | 0,26~ 0,36 | 1.350 | 0,26~ 0,36 | 490 | 0,26~ 0,36 | 380 | 0,26~ 0,36 | 430 | 0,20~ 0,26 | 430 | 0,32~ 0,40 | 240 | 0,20~ 0,26 | |
| 14 | 820 | 0,27~ 0,39 | 510 | 0,28~ 0,39 | 1.250 | 0,28~ 0,39 | 450 | 0,28~ 0,39 | 350 | 0,28~ 0,39 | 400 | 0,21~ 0,30 | 400 | 0,35~ 0,45 | 230 | 0,21~ 0,30 | |
| 15 | 760 | 0,28~ 0,42 | 480 | 0,29~ 0,41 | 1.170 | 0,29~ 0,41 | 420 | 0,29~ 0,41 | 330 | 0,29~ 0,40 | 370 | 0,22~ 0,31 | 370 | 0,36~ 0,48 | 210 | 0,22~ 0,31 | |
| 16 | 720 | 0,29~ 0,43 | 450 | 0,30~ 0,43 | 1.090 | 0,30~ 0,43 | 400 | 0,30~ 0,43 | 310 | 0,30~ 0,43 | 350 | 0,23~ 0,32 | 350 | 0,37~ 0,50 | 200 | 0,23~ 0,32 | |
| 17 | 670 | 0,30~ 0,46 | 420 | 0,32~ 0,46 | 1.030 | 0,32~ 0,46 | 370 | 0,32~ 0,46 | 290 | 0,31~ 0,45 | 330 | 0,24~ 0,34 | 330 | 0,38~ 0,52 | 190 | 0,24~ 0,34 | |
| 18 | 640 | 0,32~ 0,49 | 400 | 0,34~ 0,49 | 970 | 0,34~ 0,49 | 350 | 0,34~ 0,49 | 270 | 0,32~ 0,47 | 310 | 0,25~ 0,36 | 310 | 0,39~ 0,54 | 180 | 0,25~ 0,36 | |
| 19 | 600 | 0,33~ 0,51 | 380 | 0,35~ 0,50 | 920 | 0,35~ 0,50 | 340 | 0,35~ 0,50 | 260 | 0,33~ 0,48 | 290 | 0,25~ 0,38 | 290 | 0,40~ 0,55 | 170 | 0,25~ 0,38 | |
| 20 | 570 | 0,34~ 0,52 | 360 | 0,36~ 0,50 | 880 | 0,36~ 0,50 | 320 | 0,36~ 0,50 | 250 | 0,34~ 0,50 | 280 | 0,26~ 0,40 | 280 | 0,40~ 0,56 | 160 | 0,26~ 0,40 | |






Als Kühlmittel sollte Emulsion verwendet werden.
As coolant please use emulsion.
Il est nécessaire de lubrifier avec de l'émulsion.
Il lubrificante consigliato e' l'emulsione.

▶ Die Schnittdaten sind wie folgt zu reduzieren:
▶ The cutting data must be reduced as follows:
▶ Il faut réduire les paramètres comme suit:
▶ Ridurre i parametri come segue:

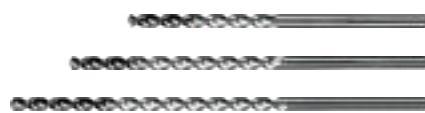
| | | | |
|---|--|-------|-------|
| Bohrungstiefe · Depth of hole · Profondeur de perçage · Profondità di foratura | 4 x d | 5 x d | 6 x d |
| Schnittgeschwindigkeit · Cutting speed · Vitesse de coupe · Velocità di taglio |  x 1,0 | x 0,9 | x 0,8 |

▶ Bei Bohrtiefen ≤ 4 x d ist kein Entspannen notwendig. Bei größeren Bohrtiefen sollte entspannt werden.
▶ In case of drilling ≤ 4 x d, step feed drilling is not necessary. If the drilling depth is > 4 x d, step feed drilling is recommended.
▶ En perçant ≤ 4 x d il n'est pas nécessaire de débouurrer. En perçant plus profond il est indispensable de débouurrer.
▶ Nel caso di forature ≤ 4 x d, non e' necessario scaricare il truciolo. Nel caso di forature > 4 x d, si consiglia di scaricare il truciolo.

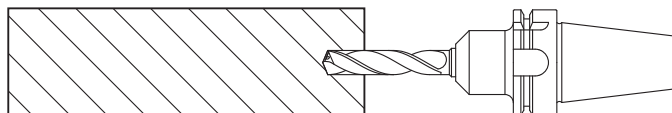
| 529 000 529 100 | | HSSE V3 | Typ UNI | ≤3xd | ≤5xd | TiN |  | | | | |
|--|---------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|--|---|-------|-------|--|--|
| MAT | 320-325 | 2.1-2.3 | 3.1-3.3 | 4.1 / 4.2 | 4.3-4.5 | | | | | | |
| V _c | | 32 ~ 40 m/min | 25 ~ 50 m/min | 32 ~ 63 m/min | 63 ~ 100 m/min | | | | | | |
| d ₁ Ø [mm] | | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | | | | | | |
| 1 | | 11.460 0,03~0,05 | 11.940 0,01~0,03 | 14.320 0,02~0,06 | 25.460 0,02~0,06 | | | | | | |
| 2 | | 5.730 0,08~0,11 | 5.970 0,04~0,06 | 7.160 0,04~0,12 | 12.730 0,04~0,12 | | | | | | |
| 3 | | 3.820 0,11~0,16 | 3.980 0,06~0,09 | 4.770 0,06~0,18 | 8.490 0,06~0,18 | | | | | | |
| 4 | | 2.860 0,13~0,19 | 2.980 0,08~0,11 | 3.580 0,08~0,24 | 6.370 0,08~0,24 | | | | | | |
| 5 | | 2.290 0,16~0,22 | 2.390 0,10~0,13 | 2.860 0,10~0,30 | 5.090 0,10~0,30 | | | | | | |
| 6 | | 1.910 0,19~0,26 | 1.990 0,12~0,15 | 2.390 0,12~0,36 | 4.240 0,12~0,36 | | | | | | |
| 8 | | 1.430 0,21~0,30 | 1.490 0,16~0,20 | 1.790 0,16~0,45 | 3.180 0,16~0,45 | | | | | | |
| 10 | | 1.150 0,25~0,35 | 1.190 0,20~0,25 | 1.430 0,20~0,55 | 2.550 0,20~0,55 | | | | | | |
| 12 | | 950 0,30~0,42 | 990 0,24~0,30 | 1.190 0,24~0,66 | 2.120 0,24~0,66 | | | | | | |
| 13 | | 880 0,31~0,42 | 920 0,26~0,32 | 1.100 0,25~0,72 | 1.960 0,25~0,72 | | | | | | |
| 14 | | 820 0,32~0,44 | 850 0,26~0,34 | 1.020 0,27~0,74 | 1.820 0,27~0,74 | | | | | | |
| 15 | | 760 0,33~0,45 | 800 0,26~0,36 | 950 0,29~0,80 | 1.700 0,29~0,80 | | | | | | |
| 16 | | 720 0,34~0,46 | 750 0,27~0,37 | 900 0,30~0,83 | 1.590 0,30~0,83 | | | | | | |
| 17 | | 670 0,35~0,48 | 700 0,28~0,39 | 840 0,31~0,88 | 1.500 0,31~0,88 | | | | | | |
| 18 | | 640 0,36~0,50 | 660 0,29~0,41 | 800 0,32~0,94 | 1.410 0,32~0,94 | | | | | | |
| 19 | | 600 0,38~0,53 | 630 0,30~0,43 | 750 0,34~0,97 | 1.340 0,34~0,97 | | | | | | |
| 20 | | 570 0,40~0,56 | 600 0,30~0,44 | 720 0,36~1,00 | 1.270 0,36~1,00 | | | | | | |
|  <p>Als Kühlmittel sollte Emulsion verwendet werden. As coolant please use emulsion. Il est nécessaire de lubrifier avec de l'émulsion. Il lubrificante consigliato e' l'emulsione.</p> | | | | | | | | | | | |
| <p>▶ Die Schnittdaten sind wie folgt zu reduzieren: ▶ The cutting data must be reduced as follows: ▶ Il faut réduire les paramètres comme suit: ▶ Ridurre i parametri come segue:</p> | | | | | | | | | | | |
| Bohrungstiefe · Depth of hole · Profondeur de perçage · Profondità di foratura | | | | | | 4 x d | 5 x d | 6 x d | | | |
| Schnittgeschwindigkeit · Cutting speed · Vitesse de coupe · Velocità di taglio | | | | | |  | x 1,0 | x 0,9 | x 0,8 | | |
| <p>▶ Bei Bohrtiefen ≤ 4 x d ist kein Entspannen notwendig. Bei größeren Bohrtiefen sollte entspannt werden. ▶ In case of drilling ≤ 4 x d, step feed drilling is not necessary. If the drilling depth is > 4 x d, step feed drilling is recommended. ▶ En perçant ≤ 4 x d il n'est pas nécessaire de débouurrer. En perçant plus profond il est indispensable de débouurrer. ▶ Nel caso di forature ≤ 4 x d, non e' necessario scaricare il truciolo. Nel caso di forature > 4 x d, si consiglia di scaricare il truciolo.</p> | | | | | | | | | | | |



528 010
528 015
528 020

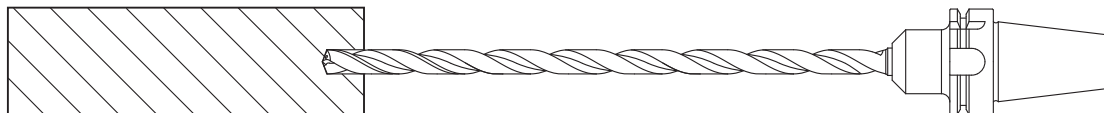


| MAT | 1.1 | 1.2-1.3 | 1.5 (bis 900 N) | 2.1-2.2 | 2.3 |
|-------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| V_c | 20 ~ 24 m/min | 18 ~ 22 m/min | 12 ~ 16 m/min | 18 ~ 24 m/min | 16 ~ 20 m/min |
| d_1 | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] |
| 1,6 | 4080 0,016 - 0,03 | 3980 0,016 - 0,03 | 2790 0,016 - 0,03 | 4170 0,03 - 0,05 | 3580 0,016 - 0,03 |
| 2 | 3500 0,02 - 0,05 | 3180 0,02 - 0,04 | 2230 0,02 - 0,04 | 3340 0,04 - 0,06 | 2860 0,02 - 0,04 |
| 3 | 2330 0,03 - 0,08 | 2120 0,03 - 0,08 | 1490 0,03 - 0,07 | 2230 0,06 - 0,10 | 1900 0,03 - 0,08 |
| 4 | 1750 0,04 - 0,10 | 1600 0,04 - 0,10 | 1100 0,04 - 0,09 | 1670 0,08 - 0,13 | 1430 0,04 - 0,10 |
| 5 | 1400 0,05 - 0,13 | 1270 0,05 - 0,13 | 890 0,05 - 0,12 | 1340 0,10 - 0,16 | 1140 0,05 - 0,13 |
| 6 | 1160 0,06 - 0,15 | 1060 0,06 - 0,15 | 740 0,06 - 0,14 | 1100 0,12 - 0,19 | 950 0,06 - 0,15 |
| 8 | 870 0,08 - 0,20 | 800 0,08 - 0,20 | 550 0,08 - 0,18 | 840 0,16 - 0,26 | 720 0,08 - 0,20 |
| 10 | 700 0,10 - 0,25 | 630 0,10 - 0,25 | 440 0,10 - 0,23 | 670 0,20 - 0,32 | 570 0,10 - 0,25 |
| 12 | 580 0,12 - 0,30 | 530 0,12 - 0,30 | 370 0,12 - 0,28 | 560 0,24 - 0,38 | 480 0,12 - 0,30 |



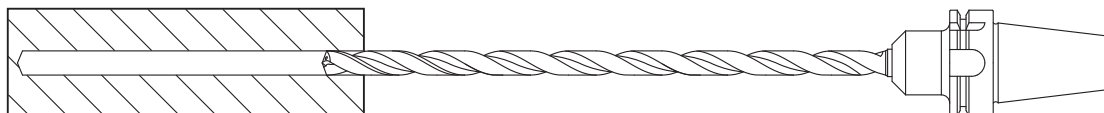
- ▶ Pilotbohrung erstellen mit WEXO-Spiralbohrer 529000 (d_1 max. + 0,1 mm).
- ▶ Produce the pilote hole with WEXO drill 529000 (d_1 max. + 0,1 mm).
- ▶ Effectuer le perçage pilote (pré perçage) avec foret Wexo 529000 (d_1 max. + 0,1 mm).
- ▶ Eseguire foro pilota con punte WEXO 529000 (d_1 max. + 0,1 mm).

Die Bohrtiefe der Pilotbohrung muss mindestens 3 x d_1 betragen.
The minimum depth of hole has to be 3 x d_1 .
La profondeur du perçage pilote doit être au minimum 3 x d_1 .
La profondità del foro pilota deve essere minimo 3 x d_1 .



- ▶ Beim Eintritt des Tieflochbohrers in die Pilotbohrung sind die Schnittdaten wie folgt zu reduzieren:
- ▶ At the entrance of the deep hole drill into the pilot hole the cutting data must be reduced as follows:
- ▶ En entrant dans le perçage pilote avec le foret long il faut réduire les paramètres de coupe comme suit :
- ▶ Inserendo la punta nel foro pilota, i parametri di taglio vanno ridotti come segue:


| | | |
|---|-------|-----------------------------|
| Drehzahl · Speed · Vitesse de rotation · Numero di giri | n | 300 ~ 400 min ⁻¹ |
| Vorschubgeschwindigkeit · Feed · Avance · Velocità di avanzamento | v_f | 30 ~ 40 % |




- ▶ Beim Ausfahren des Tieflochbohrers bis auf Tiefe der Pilotbohrung sind die Schnittdaten wie folgt zu reduzieren:
- ▶ During back out of the deep hole drill up to the depth of the pilot hole the cutting data must be reduced as follows:
- ▶ En sortant du trou avec le foret long jusqu'à la profondeur de perçage pilote il faut réduire les paramètres comme suit:
- ▶ Per estare la punta per fori profondi dal foro eseguito, ridurre i parametri come segue:

| | | |
|---|---|-----------------------------|
| Drehzahl · Speed · Vitesse de rotation · Numero di giri | n | 300 ~ 400 min ⁻¹ |
|---|---|-----------------------------|

- ▶ Für Prozesssichere Bearbeitung fördern Sie die Spanabfuhr indem möglichst viel Kühlmittel in die Bohrung eingebracht wird.
In order to achieve process reliability in machining operations, improve chip removal by adding as much coolant as possible to the drilling procedure.
- ▶ Pour un usinage fiable, vous favorisez l'évacuation des copeaux en introduisant le plus de réfrigérant possible dans le trou.
- ▶ Per ottenere una lavorazione sicura agevolate l'evacuazione del truciolo aumentando il piu possibile la quantità di refrigerante nel foro.


| 529 500 | | PS105 | Typ SH53 | ≤3xd | TiCN |  | | | | | | | | | | |
|-----------------------|------------------------|---------------------|------------------------|---|------------------------|---|------------------------|---------------|------------------------|-----------|------------------------|-----------|------------------------|----------|-------|-----------|
| MAT | 320-325 | 1.1.1 (< 500 N/mm²) | | 1.1.2-1.1.4 / 1.2.1 / 1.3 (710 ~ 900 N/mm²) | | 1.2.2 / 1.2.4 (< 710 N/mm²) | | 1.2.3 | | 1.4 / 1.5 | | | | 2.1-2.3 | | |
| | | (< 900 N/mm²) | | (< 1100 N/mm²) | | 34 ~ 43 HRC (1100 - 1400 N/mm²) | | | | | | | | | | |
| V _c | 38 ~ 50 m/min | 25 ~ 32 m/min | 25 ~ 36 m/min | 50 ~ 60 m/min | 12 ~ 20 m/min | 10 ~ 16 m/min | 16 ~ 20 m/min | 40 ~ 60 m/min | | | | | | | | |
| d ₁ ∅ [mm] | n [min ⁻¹] | f [mm/U] | n [min ⁻¹] | f [mm/U] | n [min ⁻¹] | f [mm/U] | n [min ⁻¹] | f [mm/U] | n [min ⁻¹] | f [mm/U] | n [min ⁻¹] | f [mm/U] | n [min ⁻¹] | f [mm/U] | | |
| 2 | 7.000 | 0,06~0,09 | 4.540 | 0,06~0,09 | 4.850 | 0,06~0,09 | 8.750 | 0,06~0,09 | 2.550 | 0,06~0,09 | 2.070 | 0,06~0,09 | 2.860 | 0,02 | 7.960 | 0,08~0,11 |
| 3 | 4.670 | 0,10~0,13 | 3.020 | 0,10~0,13 | 3.240 | 0,10~0,13 | 5.840 | 0,09~0,13 | 1.700 | 0,10~0,13 | 1.380 | 0,10~0,13 | 1.910 | 0,03 | 5.310 | 0,11~0,16 |
| 4 | 3.500 | 0,11~0,15 | 2.270 | 0,11~0,15 | 2.430 | 0,11~0,15 | 4.380 | 0,11~0,15 | 1.270 | 0,11~0,15 | 1.030 | 0,11~0,15 | 1.430 | 0,05 | 3.980 | 0,13~0,19 |
| 5 | 2.800 | 0,12~0,18 | 1.810 | 0,12~0,18 | 1.940 | 0,12~0,18 | 3.500 | 0,12~0,18 | 1.020 | 0,12~0,18 | 830 | 0,12~0,18 | 1.150 | 0,07 | 3.180 | 0,16~0,22 |
| 6 | 2.330 | 0,13~0,19 | 1.510 | 0,13~0,19 | 1.620 | 0,13~0,19 | 2.920 | 0,13~0,19 | 850 | 0,13~0,19 | 690 | 0,13~0,19 | 950 | 0,08 | 2.650 | 0,19~0,26 |
| 7 | 2.000 | 0,15~0,22 | 1.300 | 0,15~0,22 | 1.390 | 0,15~0,22 | 2.500 | 0,15~0,22 | 730 | 0,15~0,22 | 590 | 0,15~0,22 | 820 | 0,09 | 2.270 | 0,20~0,28 |
| 8 | 1.750 | 0,16~0,24 | 1.130 | 0,16~0,24 | 1.210 | 0,16~0,24 | 2.190 | 0,17~0,24 | 640 | 0,16~0,24 | 520 | 0,16~0,24 | 720 | 0,10 | 1.990 | 0,21~0,30 |
| 9 | 1.560 | 0,18~0,26 | 1.010 | 0,18~0,26 | 1.080 | 0,18~0,26 | 1.950 | 0,18~0,26 | 570 | 0,18~0,26 | 460 | 0,18~0,26 | 640 | 0,11 | 1.770 | 0,23~0,33 |
| 10 | 1.400 | 0,20~0,28 | 910 | 0,20~0,28 | 970 | 0,20~0,28 | 1.750 | 0,20~0,26 | 510 | 0,20~0,28 | 410 | 0,20~0,28 | 570 | 0,12 | 1.590 | 0,25~0,36 |
| 11 | 1.270 | 0,22~0,31 | 820 | 0,22~0,31 | 880 | 0,22~0,31 | 1.590 | 0,24~0,32 | 460 | 0,22~0,31 | 380 | 0,22~0,31 | 520 | 0,14 | 1.450 | 0,28~0,39 |
| 12 | 1.170 | 0,24~0,34 | 760 | 0,24~0,34 | 810 | 0,24~0,34 | 1.460 | 0,24~0,34 | 420 | 0,24~0,34 | 340 | 0,24~0,34 | 480 | 0,15 | 1.330 | 0,30~0,42 |
| 13 | 1.080 | 0,26~0,36 | 700 | 0,26~0,36 | 750 | 0,26~0,36 | 1.350 | 0,26~0,36 | 390 | 0,26~0,36 | 320 | 0,26~0,36 | 440 | 0,16 | 1.220 | 0,31~0,42 |
| 14,1 | 990 | 0,28~0,38 | 640 | 0,28~0,38 | 690 | 0,28~0,38 | 1.240 | 0,28~0,39 | 360 | 0,28~0,38 | 290 | 0,28~0,38 | 410 | 0,17 | 1.130 | 0,32~0,44 |
| 17,7 | 790 | 0,36~0,46 | 510 | 0,36~0,46 | 550 | 0,36~0,46 | 990 | 0,32~0,48 | 290 | 0,36~0,46 | 230 | 0,36~0,46 | 320 | 0,21 | 900 | 0,36~0,52 |

| MAT | 320-325 | 8.2.1 | | | | | | |
|-----------------------|------------------------|-------------|------------------------|---------------------------------|---------------------------------|----------|-------|------|
| | | 5 | 6 | 43 ~ 48 HRC (1400 - 1600 N/mm²) | 48 ~ 53 HRC (1600 - 1900 N/mm²) | | | |
| V _c | 6 ~ 10 m/min | 6 ~ 8 m/min | 12 ~ 15 m/min | 8 ~ 12 m/min | | | | |
| d ₁ ∅ [mm] | n [min ⁻¹] | f [mm/U] | n [min ⁻¹] | f [mm/U] | n [min ⁻¹] | f [mm/U] | | |
| 2 | 1.270 | 0,02~0,04 | 1.110 | 0,02~0,04 | 2.150 | 0,02 | 1.590 | 0,02 |
| 3 | 850 | 0,03~0,06 | 740 | 0,03~0,06 | 1.430 | 0,03 | 1.060 | 0,03 |
| 4 | 640 | 0,04~0,08 | 560 | 0,04~0,08 | 1.070 | 0,04 | 800 | 0,04 |
| 5 | 510 | 0,05~0,10 | 450 | 0,05~0,10 | 860 | 0,05 | 640 | 0,05 |
| 6 | 420 | 0,06~0,12 | 370 | 0,06~0,12 | 720 | 0,06 | 530 | 0,06 |
| 7 | 360 | 0,07~0,14 | 320 | 0,07~0,14 | 610 | 0,07 | 450 | 0,07 |
| 8 | 320 | 0,08~0,16 | 280 | 0,08~0,16 | 540 | 0,08 | 400 | 0,08 |
| 9 | 280 | 0,09~0,18 | 250 | 0,09~0,18 | 480 | 0,09 | 350 | 0,09 |
| 10 | 250 | 0,10~0,20 | 220 | 0,10~0,20 | 430 | 0,10 | 320 | 0,10 |
| 11 | 230 | 0,11~0,22 | 200 | 0,11~0,22 | 390 | 0,11 | 290 | 0,11 |
| 12 | 210 | 0,12~0,24 | 190 | 0,12~0,24 | 360 | 0,12 | 270 | 0,12 |
| 13 | 200 | 0,13~0,26 | 170 | 0,13~0,26 | 330 | 0,13 | 240 | 0,13 |
| 14,1 | 180 | 0,14~0,28 | 160 | 0,14~0,28 | 300 | 0,14 | 230 | 0,14 |
| 17,7 | 140 | 0,18~0,34 | 130 | 0,18~0,34 | 240 | 0,18 | 180 | 0,18 |


| | |
|---|--|
|  | <p>Als Kühlmittel sollte Emulsion verwendet werden. As coolant please use emulsion. Il est nécessaire de lubrifier avec de l'émulsion. Il lubrificante consigliato e' l'emulsione.</p> |
| ▶ | Bei Bohrtiefen ≤ 3 x d ist kein Entspannen notwendig. Bei größeren Bohrtiefen sollte entspannt werden. |
| ▶ | In case of drilling ≤ 3 x d, step feed drilling is not necessary. If the drilling depth is > 3 x d, step feed drilling is recommended. |
| ▶ | En perçant ≤ 3 x d il n'est pas nécessaire de déburrer. En perçant plus profond il est indispensable de déburrer. |
| ▶ | Nel caso di forature ≤ 3 x d, non e' necessario scaricare il truciolo. Nel caso di forature > 3 x d, si consiglia di scaricare il truciolo. |




| 529 700 | | PS 105 | | ≤5xd | | TiCN | | | | | | | |
|-----------------------|---------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| MAT | 320-325 | 1.1.1 | 1.1.2-1.1.4 / 1.2.1 / 1.3 | 1.2.2 / 1.2.4 | 1.2.3 | 1.4 / 1.5.1-1.5.3 | 1.5.4-1.5.5 < 35 HRC | 2.1-2.3 | 4.3-4.5 | | | | |
| V _c | | 38 ~ 50 m/min | 25 ~ 32 m/min | 25 ~ 36 m/min | 50 ~ 60 m/min | 12 ~ 20 m/min | 10 ~ 16 m/min | 40 ~ 63 m/min | 70 ~ 120 m/min | | | | |
| d ₁ ∅ [mm] | | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] |
| 2 | | 7.000 0,06~0,09 | 4.540 0,06~0,09 | 4.850 0,06~0,09 | 8.750 0,06~0,09 | 2.550 0,06~0,09 | 2.070 0,06~0,09 | 8.200 0,08~0,11 | 15.120 0,12~0,18 | | | | |
| 3 | | 4.670 0,10~0,13 | 3.020 0,10~0,13 | 3.240 0,10~0,13 | 5.840 0,09~0,13 | 1.700 0,10~0,13 | 1.380 0,10~0,13 | 5.460 0,11~0,16 | 10.080 0,20~0,28 | | | | |
| 4 | | 3.500 0,11~0,15 | 2.270 0,11~0,15 | 2.430 0,11~0,15 | 4.380 0,11~0,15 | 1.270 0,11~0,15 | 1.030 0,11~0,15 | 4.100 0,13~0,19 | 7.560 0,24~0,38 | | | | |
| 5 | | 2.800 0,12~0,18 | 1.810 0,12~0,18 | 1.940 0,12~0,18 | 3.500 0,12~0,18 | 1.020 0,12~0,18 | 830 0,12~0,18 | 3.280 0,16~0,22 | 6.050 0,28~0,40 | | | | |
| 6 | | 2.330 0,13~0,19 | 1.510 0,13~0,19 | 1.620 0,13~0,19 | 2.920 0,13~0,19 | 850 0,13~0,19 | 690 0,13~0,19 | 2.730 0,19~0,26 | 5.040 0,34~0,48 | | | | |
| 8 | | 1.750 0,16~0,24 | 1.130 0,16~0,24 | 1.210 0,16~0,24 | 2.500 0,16~0,24 | 640 0,16~0,24 | 520 0,16~0,24 | 2.050 0,21~0,30 | 3.780 0,38~0,53 | | | | |
| 10 | | 1.400 0,20~0,28 | 910 0,20~0,28 | 970 0,20~0,28 | 1.750 0,20~0,28 | 510 0,20~0,28 | 410 0,20~0,28 | 1.640 0,25~0,36 | 3.020 0,45~0,63 | | | | |
| 12 | | 1.170 0,24~0,34 | 760 0,24~0,34 | 810 0,24~0,34 | 1.460 0,24~0,34 | 420 0,24~0,34 | 340 0,24~0,34 | 1.370 0,30~0,42 | 2.520 0,53~0,75 | | | | |
| 13 | | 1.080 0,26~0,36 | 700 0,26~0,36 | 750 0,26~0,36 | 1.350 0,26~0,36 | 390 0,26~0,36 | 320 0,26~0,36 | 1.260 0,31~0,42 | 2.330 0,56~0,79 | | | | |
| 14 | | 1.000 0,28~0,39 | 650 0,28~0,39 | 690 0,28~0,39 | 1.250 0,28~0,39 | 360 0,28~0,39 | 300 0,28~0,39 | 1.170 0,32~0,44 | 2.160 0,57~0,81 | | | | |
| 16 | | 880 0,30~0,43 | 540 0,30~0,43 | 580 0,30~0,43 | 1.090 0,30~0,43 | 300 0,30~0,43 | 260 0,30~0,43 | 1.020 0,34~0,46 | 2.090 0,61~0,85 | | | | |
| 18 | | 780 0,34~0,49 | 480 0,34~0,49 | 510 0,34~0,49 | 970 0,34~0,49 | 270 0,34~0,49 | 230 0,34~0,49 | 900 0,36~0,50 | 1.860 0,63~0,90 | | | | |
| 20 | | 700 0,36~0,50 | 430 0,36~0,50 | 460 0,36~0,50 | 880 0,36~0,50 | 240 0,36~0,50 | 210 0,36~0,50 | 810 0,40~0,56 | 1.670 0,68~0,98 | | | | |
| 22 | | 640 0,40~0,55 | 390 0,40~0,55 | 420 0,40~0,55 | 800 0,40~0,55 | 220 0,40~0,55 | 190 0,40~0,55 | 740 0,42~0,59 | 1.520 0,73~1,06 | | | | |
| 24 | | 580 0,41~0,60 | 360 0,41~0,60 | 380 0,41~0,60 | 730 0,41~0,60 | 200 0,41~0,60 | 170 0,41~0,60 | 680 0,46~0,65 | 1.390 0,77~1,33 | | | | |
| 26 | | 540 0,42~0,65 | 330 0,42~0,65 | 360 0,42~0,65 | 670 0,42~0,65 | 180 0,42~0,65 | 160 0,42~0,65 | 620 0,47~0,68 | 1.290 0,81~1,20 | | | | |
| 28 | | 500 0,45~0,70 | 310 0,45~0,70 | 330 0,45~0,70 | 630 0,45~0,70 | 170 0,45~0,70 | 150 0,45~0,70 | 580 0,50~0,73 | 1.190 0,84~1,26 | | | | |
| 30 | | 470 0,48~0,75 | 290 0,48~0,75 | 310 0,48~0,75 | 580 0,48~0,75 | 160 0,48~0,75 | 140 0,48~0,75 | 540 0,54~0,78 | 1.110 0,87~1,32 | | | | |
| 32 | | 440 0,51~0,80 | 270 0,51~0,80 | 290 0,51~0,80 | 550 0,51~0,80 | 150 0,51~0,80 | 130 0,51~0,80 | 510 0,58~0,83 | 1.040 0,90~1,38 | | | | |

 Als Kühlmittel sollte Emulsion verwendet werden.
As coolant please use emulsion.
Il est nécessaire de lubrifier avec de l'émulsion.
Il lubrificante consigliato e' l'emulsione.

▶ Die Schnittdaten sind wie folgt zu reduzieren:
▶ The cutting data must be reduced as follows:
▶ Il faut réduire les paramètres comme suit:
▶ Ridurre i parametri come segue:


| | | | |
|--|--|-------|-------|
| Bohrungstiefe · Depth of hole · Profondeur de perçage · Profondità di foratura | 4 x d | 5 x d | 6 x d |
| Schnittgeschwindigkeit · Cutting speed · Vitesse de coupe · Velocità di taglio |  x 1,0 | x 0,9 | x 0,8 |

▶ Bei Bohrtiefen ≤ 4 x d ist kein Entspannen notwendig. Bei größeren Bohrtiefen sollte entspannt werden.
▶ In case of drilling ≤ 4 x d, step feed drilling is not necessary. If the drilling depth is > 4 x d, step feed drilling is recommended.
▶ En perçant ≤ 4 x d il n'est pas nécessaire de déburrer. En perçant plus profond il est indispensable de déburrer.
▶ Nel caso di forature ≤ 4 x d, non e' necessario scaricare il truciolo. Nel caso di forature > 4 x d, si consiglia di scaricare il truciolo.


| 022 003 | | VHM | Typ SH60 + | ≤3xd | TiAlN |  | | | | | | | | |
|-----------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---|---------------------------------|---------------------------------|--|-------|-------------------------------|--|---------------------|--|
| MAT | 320-325 | 1.1 | 1.2.3 | 1.2.1 / 1.2.2 / 1.2.4 / 1.3 | | 1.4.1-1.4.3 / 1.4.5-1.4.8 | | | | 1.4.4 | 1.5.1 / 1.5.2 / 1.5.4 / 1.5.5 | | | |
| | | | | | | (< 1000 N/mm²) | | (1000 ~ 1200 N/mm²) | | | (< 1000 N/mm²) | | (1000 ~ 1200 N/mm²) | |
| V _c | 70 ~ 80 m/min | 70 ~ 90 m/min | 60 ~ 80 m/min | 60 ~ 70 m/min | 40 ~ 60 m/min | 32 ~ 38 m/min | 60 ~ 70 m/min | 40 ~ 60 m/min | | | | | | |
| d ₁ Ø [mm] | n [min ⁻¹] f [mm/U] | n [min ⁻¹] f [mm/U] | n [min ⁻¹] f [mm/U] | n [min ⁻¹] f [mm/U] | n [min ⁻¹] f [mm/U] | n [min ⁻¹] f [mm/U] | n [min ⁻¹] f [mm/U] | n [min ⁻¹] f [mm/U] | | | | | | |
| 1 | 23.900 0,04~0,06 | 25.460 0,04~0,06 | 22.300 0,03~0,05 | 20.700 0,03~0,05 | 15.900 0,02~0,04 | 11.140 0,01~0,02 | 20.700 0,02~0,04 | 15.900 0,02~0,04 | | | | | | |
| 2 | 11.950 0,07~0,09 | 12.730 0,07~0,09 | 11.150 0,06~0,08 | 10.350 0,06~0,08 | 7.950 0,05~0,07 | 5.570 0,03~0,04 | 10.350 0,05~0,07 | 7.950 0,05~0,07 | | | | | | |
| 3 | 8.000 0,10~0,12 | 8.500 0,10~0,12 | 7.450 0,09~0,11 | 6.900 0,09~0,11 | 5.300 0,08~0,10 | 3.720 0,06~0,08 | 6.900 0,08~0,10 | 5.300 0,08~0,10 | | | | | | |
| 4 | 6.000 0,15~0,17 | 6.400 0,15~0,17 | 5.570 0,13~0,15 | 5.180 0,13~0,15 | 4.000 0,11~0,13 | 2.790 0,07~0,08 | 5.180 0,11~0,13 | 4.000 0,11~0,13 | | | | | | |
| 5 | 4.800 0,18~0,20 | 5.100 0,18~0,20 | 4.460 0,16~0,18 | 4.140 0,16~0,18 | 3.200 0,14~0,16 | 2.230 0,08~0,09 | 4.140 0,14~0,16 | 3.200 0,14~0,16 | | | | | | |
| 6 | 4.000 0,21~0,23 | 4.250 0,21~0,23 | 3.720 0,19~0,21 | 3.450 0,19~0,21 | 2.650 0,17~0,19 | 1.860 0,10~0,11 | 3.450 0,17~0,19 | 2.650 0,17~0,19 | | | | | | |
| 8 | 3.000 0,24~0,26 | 3.200 0,24~0,26 | 2.790 0,22~0,24 | 2.590 0,22~0,24 | 2.000 0,20~0,22 | 1.400 0,12~0,13 | 2.590 0,20~0,22 | 2.000 0,20~0,22 | | | | | | |
| 10 | 2.400 0,27~0,29 | 2.550 0,27~0,29 | 2.230 0,25~0,27 | 2.070 0,25~0,27 | 1.600 0,23~0,25 | 1.120 0,14~0,15 | 2.070 0,23~0,25 | 1.600 0,23~0,25 | | | | | | |
| 12 | 2.000 0,30~0,32 | 2.130 0,30~0,32 | 1.860 0,28~0,30 | 1.730 0,28~0,30 | 1.340 0,26~0,28 | 930 0,16~0,17 | 1.730 0,26~0,28 | 1.340 0,26~0,28 | | | | | | |
| 14 | 1.710 0,33~0,35 | 1.820 0,33~0,35 | 1.600 0,31~0,33 | 1.480 0,31~0,33 | 1.150 0,29~0,31 | 800 0,18~0,19 | 1.480 0,29~0,31 | 1.150 0,29~0,31 | | | | | | |
| 16 | 1.500 0,36~0,38 | 1.600 0,36~0,38 | 1.400 0,34~0,36 | 1.300 0,34~0,36 | 1.000 0,32~0,34 | 700 0,20~0,21 | 1.300 0,32~0,34 | 1.000 0,32~0,34 | | | | | | |
| 18 | 1.330 0,39~0,41 | 1.420 0,39~0,41 | 1.240 0,37~0,39 | 1.150 0,37~0,39 | 890 0,35~0,37 | 620 0,22~0,23 | 1.150 0,35~0,37 | 890 0,35~0,37 | | | | | | |
| 20 | 1.200 0,42~0,44 | 1.280 0,42~0,44 | 1.120 0,40~0,42 | 1.040 0,40~0,42 | 800 0,38~0,40 | 560 0,24~0,25 | 1.040 0,38~0,40 | 800 0,38~0,40 | | | | | | |



| MAT | 320-325 | 1.5.1 / 1.5.2 / 1.5.4 / 1.5.5 (1200 ~ 1500 N/mm²) | | 1.5.3 | 2.1-2.3 | | 8.2 | | | | | |
|-----------------------|---------------------------------|---|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------|---------------|-------------|--|--|
| | | 30 ~ 35 m/min | 28 ~ 32 m/min | | 65 ~ 80 m/min | 48 ~ 55 HRC | | 55 ~ 60 HRC | | 60 ~ 65 HRC | | |
| V _c | 30 ~ 35 m/min | | | 28 ~ 32 m/min | | 65 ~ 80 m/min | 25 ~ 32 m/min | 14 ~ 20 m/min | 10 ~ 14 m/min | | | |
| d ₁ Ø [mm] | n [min ⁻¹] f [mm/U] | n [min ⁻¹] f [mm/U] | n [min ⁻¹] f [mm/U] | n [min ⁻¹] f [mm/U] | n [min ⁻¹] f [mm/U] | n [min ⁻¹] f [mm/U] | n [min ⁻¹] f [mm/U] | | | | | |
| 1 | 10.350 0,01~0,02 | 9.550 0,01~0,02 | 23.100 0,03~0,05 | 8.900 0,01~0,02 | 5.720 0,01~0,02 | 3.800 0,01~0,02 | | | | | | |
| 2 | 5.170 0,03~0,04 | 4.780 0,03~0,04 | 11.540 0,08~0,10 | 4.450 0,02~0,04 | 2.860 0,02~0,04 | 1.900 0,02~0,04 | | | | | | |
| 3 | 3.450 0,04~0,06 | 3.180 0,04~0,06 | 7.690 0,13~0,15 | 3.000 0,04~0,05 | 1.900 0,04~0,05 | 1.270 0,04~0,05 | | | | | | |
| 4 | 2.590 0,07~0,08 | 2.390 0,07~0,08 | 5.770 0,20~0,22 | 2.250 0,06~0,07 | 1.430 0,06~0,07 | 950 0,06~0,07 | | | | | | |
| 5 | 2.070 0,08~0,09 | 1.910 0,08~0,09 | 4.620 0,23~0,25 | 1.800 0,07~0,08 | 1.150 0,07~0,08 | 760 0,07~0,08 | | | | | | |
| 6 | 1.730 0,10~0,11 | 1.590 0,10~0,11 | 3.850 0,26~0,29 | 1.500 0,08~0,09 | 950 0,08~0,09 | 640 0,08~0,09 | | | | | | |
| 8 | 1.300 0,12~0,13 | 1.190 0,12~0,13 | 2.890 0,30~0,33 | 1.120 0,08~0,09 | 720 0,08~0,09 | 480 0,08~0,09 | | | | | | |
| 10 | 1.040 0,14~0,15 | 955 0,14~0,15 | 2.310 0,35~0,38 | 900 0,09~0,10 | 570 0,09~0,10 | 380 0,09~0,10 | | | | | | |
| 12 | 860 0,16~0,17 | 800 0,16~0,17 | 1.920 0,39~0,42 | 750 0,10~0,11 | 480 0,10~0,11 | 320 0,10~0,11 | | | | | | |
| 14 | 740 0,18~0,19 | 680 0,18~0,19 | 1.650 0,45~0,48 | 640 0,11~0,12 | 410 0,11~0,12 | 270 0,11~0,12 | | | | | | |
| 16 | 650 0,20~0,21 | 600 0,20~0,21 | 1.440 0,49~0,52 | 560 0,12~0,13 | 360 0,12~0,13 | 240 0,12~0,13 | | | | | | |
| 18 | 580 0,22~0,23 | 530 0,22~0,23 | 1.280 0,53~0,56 | 500 0,13~0,14 | 320 0,13~0,14 | 212 0,13~0,14 | | | | | | |
| 20 | 520 0,24~0,25 | 480 0,24~0,25 | 1.150 0,57~0,60 | 450 0,14~0,15 | 290 0,14~0,15 | 190 0,14~0,15 | | | | | | |

Einsatzbedingungen
Cutting conditions
Conditions d'utilisation
Condizioni d'uso



Emulsion
Emulsion
Emulsion
Emulsione



| 020 099 | | VHM | Typ SH70 | ≤5xd |  | | | | | |
|----------------|---|-----------------------|------------------------|----------|---|------------------------|----------|-------------------------|------------------------|----------|
| MAT | 320-325 | 8.2 | | | | | | | | |
| | | 50 ~ 54 HRC | | | 55 ~ 59 HRC | | | 60 ~ 70 HRC | | |
| V _c |  | 16 ~ 20 m/min | | | 11 ~ 15 m/min | | | 9 ~ 13 m/min | | |
| | | d ₁ ∅ [mm] | n [min ⁻¹] | f [mm/U] | v _f [mm/min] | n [min ⁻¹] | f [mm/U] | v _f [mm/min] | n [min ⁻¹] | f [mm/U] |
| 2 | | 2860 | 0,03 | 85 | 2070 | 0,03 | 62 | 1750 | 0,03 | 53 |
| 2,55 | M 3 | 2240 | 0,03 | 67 | 1630 | 0,03 | 49 | 1370 | 0,03 | 41 |
| 3 | M 3,5 | 1900 | 0,03 | 57 | 1380 | 0,03 | 41 | 1165 | 0,03 | 35 |
| 3,4 | M 4 | 1690 | 0,03 | 51 | 1225 | 0,03 | 37 | 1030 | 0,03 | 31 |
| 4 | | 1430 | 0,03 | 43 | 1035 | 0,03 | 31 | 875 | 0,03 | 26 |
| 4,3 | M 5 | 1330 | 0,04 | 53 | 960 | 0,04 | 38 | 820 | 0,04 | 33 |
| 5 | | 1150 | 0,04 | 46 | 825 | 0,04 | 33 | 700 | 0,04 | 28 |
| 5,1 | M 6 | 1125 | 0,04 | 45 | 800 | 0,04 | 32 | 680 | 0,04 | 27 |
| 6 | | 950 | 0,04 | 38 | 700 | 0,04 | 28 | 580 | 0,04 | 23 |
| 6,9 | M 8 | 830 | 0,04 | 33 | 600 | 0,04 | 24 | 505 | 0,04 | 20 |
| 7 | | 820 | 0,04 | 33 | 595 | 0,04 | 24 | 500 | 0,04 | 20 |
| 7,1 | M 8x1 | 810 | 0,04 | 32 | 580 | 0,04 | 23 | 495 | 0,04 | 20 |
| 8 | | 725 | 0,04 | 29 | 525 | 0,04 | 21 | 440 | 0,04 | 18 |
| 8,6 | M 10 | 665 | 0,05 | 33 | 480 | 0,05 | 24 | 400 | 0,05 | 20 |
| 8,9 | G 1/8" | 645 | 0,05 | 32 | 465 | 0,05 | 23 | 395 | 0,05 | 20 |
| 9 | | 640 | 0,05 | 32 | 460 | 0,05 | 23 | 390 | 0,05 | 19 |
| 9,1 | M 10x1 | 630 | 0,05 | 32 | 455 | 0,05 | 23 | 385 | 0,05 | 19 |
| 10 | | 580 | 0,05 | 29 | 420 | 0,05 | 21 | 355 | 0,05 | 18 |
| 10,4 | M 12 | 560 | 0,05 | 28 | 400 | 0,05 | 20 | 340 | 0,05 | 17 |
| 10,6 | M 12x1,5 | 540 | 0,05 | 27 | 390 | 0,05 | 20 | 335 | 0,05 | 17 |
| 11 | | 525 | 0,05 | 27 | 380 | 0,05 | 19 | 320 | 0,05 | 16 |
| 11,1 | M 12x1 | 520 | 0,05 | 26 | 375 | 0,05 | 19 | 315 | 0,05 | 16 |
| 11,9 | G 1/4" | 485 | 0,05 | 24 | 350 | 0,05 | 18 | 300 | 0,05 | 15 |
| 12 | | 480 | 0,05 | 24 | 345 | 0,05 | 17 | 295 | 0,05 | 15 |
| 12,1 | M 14 | 475 | 0,05 | 24 | 340 | 0,05 | 17 | 290 | 0,05 | 15 |
| 12,6 | M 14x1,5 | 460 | 0,05 | 23 | 330 | 0,05 | 16 | 280 | 0,05 | 14 |
| 14,1 | M 16 | 405 | 0,06 | 24 | 295 | 0,06 | 18 | 250 | 0,06 | 15 |
| 14,6 | M 16x1,5 | 400 | 0,06 | 24 | 285 | 0,06 | 17 | 240 | 0,06 | 14 |
| 17,7 | M 20 | 320 | 0,06 | 19 | 235 | 0,06 | 14 | 200 | 0,06 | 12 |
| 18,6 | M 20x1,5 | 300 | 0,06 | 18 | 220 | 0,06 | 13 | 190 | 0,06 | 11 |

Einsatzbedingungen
Conditions d'utilisation


Cutting conditions
Condizioni d'uso

1. Werkzeug nicht im Dreibacken-Bohrfutter spannen!
Never clamp the drill in a three-jaw chuck!
Ne pas utiliser des mandrins de serrage!
Non bloccare mai la punta in un mandrino a tre griffe!
2. Als Kühlschmiermittel sollte eine 8–10%-ige Emulsion verwendet werden.
The usage of a water-soluble oil (emulsion 8–10%) is recommended.
Pour lubrifier, utiliser une émulsion entre 8–10%.
Si raccomanda l'uso di emulsione 8–10%.
3. Der Rundlauffehler an der Schneide sollte nicht größer als 0,020 mm sein.
The maximum radial-run-out (error) must be smaller than 0,020 mm.
Le faux-rond au niveau des tranchants ne doit pas dépasser 0.020 mm.
Il massimo errore di concentricità non deve superare i 0,020 mm.
4. Bei Bohrtiefen ≤ 3 x d ist kein Entspannen notwendig. Bei größeren Bohrtiefen sollte entspannt werden; es besteht jedoch die Gefahr, dass Schneidenausbrüche durch zurückbleibende Späne am Bohrungsgrund entstehen.
In case of drilling ≤ 3 x d, step feed drilling is not necessary. If the drilling depth is > 3 x d, step feed drilling is recommended; please note, that chipping of the cutting edge can happen due to remaining chips into the hole.
En perçant ≤ 3 x d il n'est pas nécessaire de débourrer. En perçant plus profond il est indispensable de débourrer mais il est possible que les copeaux au fond du trou endommagent les tranchants du foret.
Nel caso di forature ≤ 3 x d, non è necessario scaricare il truciolo. Nel caso di forature > 3 x d, si consiglia di scaricare il truciolo; le scheggiature sul tagliente accadono spesso a causa del truciolo rimasto nel foro.


| 024 003 | | VHM | Typ VA | IKZ | ≤3xd | TIAIN | Emulsion Emulsion Emulsion Emulsion |  | | | |
|------------------|---------|------------------------------------|------------------------------------|------------------------------------|------|------------------------------------|--|---|--|------------------------------------|------------------------------------|
| MAT | 320-325 | 1.1 | 1.2.3 | 1.2.1 / 1.2.2 / 1.2.4 / 1.3 | | 1.6.1 | 1.6.2 | 1.6.3 / 1.6.4 | | 1.6.5 | 1.6.6 |
| V _c | | 90 ~ 140 m/min | 100 ~ 160 m/min | 80 ~ 110 m/min | | 40 ~ 60 m/min | 35 ~ 50 m/min | 40 ~ 60 m/min | | 30 ~ 45 m/min | 25 ~ 32 m/min |
| d ₁ Ø | Ø | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] |
| 2 | | 18.300 0,04~0,06 | 20.690 0,04~0,06 | 15.120 0,04~0,06 | | 7.980 0,03~0,04 | 6.780 0,03~0,04 | 7.980 0,03~0,04 | | 5.970 0,03~0,04 | 4.530 0,02~0,03 |
| 3 | | 12.200 0,07~0,08 | 13.800 0,07~0,08 | 10.080 0,07~0,08 | | 5.300 0,04~0,06 | 4.500 0,04~0,06 | 5.300 0,04~0,06 | | 3.980 0,04~0,06 | 3.020 0,03~0,04 |
| 4 | | 9.150 0,10~0,12 | 10.350 0,10~0,12 | 7.560 0,10~0,12 | | 4.000 0,07~0,08 | 3.400 0,07~0,08 | 4.000 0,07~0,08 | | 3.000 0,07~0,08 | 2.270 0,05~0,06 |
| 5 | | 7.320 0,12~0,14 | 8.280 0,12~0,14 | 6.050 0,12~0,14 | | 3.200 0,08~0,09 | 2.700 0,08~0,09 | 3.200 0,08~0,09 | | 2.400 0,08~0,09 | 1.810 0,06~0,07 |
| 6 | | 6.100 0,14~0,16 | 6.900 0,14~0,16 | 5.040 0,14~0,16 | | 2.650 0,10~0,11 | 2.250 0,10~0,11 | 2.650 0,10~0,11 | | 2.000 0,10~0,11 | 1.510 0,07~0,08 |
| 8 | | 4.580 0,16~0,18 | 5.170 0,16~0,18 | 3.780 0,16~0,18 | | 2.000 0,12~0,13 | 1.700 0,12~0,13 | 2.000 0,12~0,13 | | 1.500 0,12~0,13 | 1.130 0,09~0,10 |
| 10 | | 3.660 0,19~0,20 | 4.140 0,19~0,20 | 3.030 0,19~0,20 | | 1.600 0,14~0,15 | 1.350 0,14~0,15 | 1.600 0,14~0,15 | | 1.200 0,14~0,15 | 910 0,11~0,12 |
| 12 | | 3.050 0,21~0,23 | 3.450 0,21~0,23 | 2.520 0,21~0,23 | | 1.330 0,16~0,17 | 1.130 0,16~0,17 | 1.330 0,16~0,17 | | 1.000 0,16~0,17 | 760 0,13~0,14 |
| 14 | | 2.610 0,24~0,26 | 2.960 0,24~0,26 | 2.160 0,24~0,26 | | 1.140 0,18~0,19 | 970 0,18~0,19 | 1.140 0,18~0,19 | | 850 0,18~0,19 | 650 0,15~0,16 |
| 16 | | 2.290 0,27~0,29 | 2.590 0,27~0,29 | 1.890 0,27~0,29 | | 1.000 0,20~0,21 | 850 0,20~0,21 | 1.000 0,20~0,21 | | 750 0,20~0,21 | 570 0,17~0,18 |
| 18 | | 2.030 0,30~0,32 | 2.300 0,30~0,32 | 1.680 0,30~0,32 | | 890 0,22~0,23 | 750 0,22~0,23 | 890 0,22~0,23 | | 660 0,22~0,23 | 500 0,19~0,20 |
| 20 | | 1.830 0,33~0,35 | 2.070 0,33~0,35 | 1.510 0,33~0,35 | | 800 0,24~0,25 | 680 0,24~0,25 | 800 0,24~0,25 | | 600 0,24~0,25 | 450 0,21~0,22 |

| MAT | 320-325 | 1.4 (< 1000 N/mm ²) | 1.5 (< 1000 N/mm ²) | 2.1 / 2.2 | 2.3 / 2.4 | 3.1-3.4 | 4 | 5 (1000 ~ 1200 N/mm ²) | |
|------------------|---------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|---------------------------------------|------------------------------------|
| V _c | | 70 ~ 90 m/min | 70 ~ 90 m/min | 80 ~ 110 m/min | 70 ~ 90 m/min | 90 ~ 110 m/min | 200 ~ 260 m/min | 30 ~ 40 m/min | 25 ~ 35 m/min |
| d ₁ Ø | Ø | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] |
| 2 | | 12.730 0,03~0,04 | 12.730 0,03~0,04 | 15.120 0,07~0,09 | 12.730 0,04~0,06 | 15.900 0,06~0,08 | 36.600 0,07~0,09 | 5.570 0,02~0,03 | 4.770 0,02~0,03 |
| 3 | | 8.490 0,04~0,06 | 8.490 0,04~0,06 | 10.080 0,10~0,12 | 8.490 0,07~0,08 | 10.610 0,10~0,12 | 24.400 0,10~0,12 | 3.720 0,03~0,05 | 3.180 0,03~0,05 |
| 4 | | 6.370 0,07~0,08 | 6.370 0,07~0,08 | 7.560 0,13~0,15 | 6.370 0,10~0,12 | 7.960 0,13~0,15 | 18.300 0,14~0,16 | 2.790 0,06~0,07 | 2.390 0,06~0,07 |
| 5 | | 5.090 0,08~0,09 | 5.090 0,08~0,09 | 6.050 0,15~0,17 | 5.090 0,12~0,14 | 6.370 0,15~0,17 | 14.650 0,18~0,20 | 2.230 0,08~0,09 | 1.910 0,08~0,09 |
| 6 | | 4.240 0,10~0,11 | 4.240 0,10~0,11 | 5.040 0,18~0,20 | 4.240 0,14~0,16 | 5.300 0,18~0,20 | 12.200 0,24~0,26 | 1.860 0,09~0,10 | 1.600 0,09~0,10 |
| 8 | | 3.180 0,12~0,13 | 3.180 0,12~0,13 | 3.780 0,21~0,24 | 3.180 0,16~0,18 | 3.980 0,21~0,24 | 9.150 0,26~0,28 | 1.400 0,11~0,12 | 1.200 0,11~0,12 |
| 10 | | 2.550 0,14~0,15 | 2.550 0,14~0,15 | 3.030 0,26~0,29 | 2.550 0,19~0,20 | 3.180 0,26~0,29 | 7.320 0,34~0,36 | 1.120 0,13~0,14 | 950 0,13~0,14 |
| 12 | | 2.120 0,16~0,17 | 2.120 0,16~0,17 | 2.520 0,30~0,32 | 2.120 0,21~0,23 | 2.650 0,30~0,32 | 6.100 0,38~0,40 | 930 0,15~0,16 | 800 0,15~0,16 |
| 14 | | 1.820 0,18~0,19 | 1.820 0,18~0,19 | 2.160 0,33~0,35 | 1.820 0,24~0,26 | 2.270 0,33~0,35 | 5.230 0,41~0,43 | 800 0,17~0,18 | 680 0,17~0,18 |
| 16 | | 1.590 0,20~0,21 | 1.590 0,20~0,21 | 1.890 0,36~0,38 | 1.590 0,27~0,29 | 1.990 0,36~0,38 | 4.580 0,44~0,46 | 700 0,19~0,20 | 600 0,19~0,20 |
| 18 | | 1.410 0,22~0,23 | 1.410 0,22~0,23 | 1.680 0,38~0,40 | 1.410 0,30~0,32 | 1.770 0,38~0,40 | 4.070 0,47~0,49 | 620 0,21~0,22 | 530 0,21~0,22 |
| 20 | | 1.270 0,24~0,25 | 1.270 0,24~0,25 | 1.510 0,41~0,44 | 1.270 0,33~0,35 | 1.590 0,41~0,44 | 3.660 0,50~0,52 | 480 0,23~0,24 | 480 0,23~0,24 |




| 024 005 | | VHM | Typ VA | IKZ | ≤5xd | TIAIN | Emulsion Emulsion Emulsion Emulsion |  | |
|------------------|---------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|--|---|------------------------------------|
| MAT | 320-325 | 1.1 | 1.2.3 | 1.2.1 / 1.2.2 / 1.2.4 / 1.3 | 1.6.1 | 1.6.2 | 1.6.3 / 1.6.4 | 1.6.5 | 1.6.6 |
| V _c | | 90 ~ 120 m/min | 100 ~ 140 m/min | 80 ~ 100 m/min | 40 ~ 60 m/min | 35 ~ 50 m/min | 40 ~ 60 m/min | 30 ~ 45 m/min | 25 ~ 32 m/min |
| d ₁ ∅ | [mm] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] |
| 2 | | 16.710 0,04~0,06 | 19.100 0,04~0,06 | 14.350 0,04~0,06 | 7.980 0,03~0,04 | 6.780 0,03~0,04 | 7.980 0,03~0,04 | 5.970 0,03~0,04 | 4.530 0,02~0,03 |
| 3 | | 11.140 0,07~0,08 | 12.730 0,07~0,08 | 9.600 0,07~0,08 | 5.300 0,04~0,06 | 4.500 0,04~0,06 | 5.300 0,04~0,06 | 3.980 0,04~0,06 | 3.020 0,03~0,04 |
| 4 | | 8.360 0,10~0,12 | 9.550 0,10~0,12 | 7.200 0,10~0,12 | 4.000 0,07~0,08 | 3.400 0,07~0,08 | 4.000 0,07~0,08 | 3.000 0,07~0,08 | 2.270 0,05~0,06 |
| 5 | | 6.690 0,12~0,14 | 7.640 0,12~0,14 | 5.750 0,12~0,14 | 3.200 0,08~0,09 | 2.700 0,08~0,09 | 3.200 0,08~0,09 | 2.400 0,08~0,09 | 1.810 0,06~0,07 |
| 6 | | 5.570 0,14~0,16 | 6.370 0,14~0,16 | 4.800 0,14~0,16 | 2.650 0,10~0,11 | 2.250 0,10~0,11 | 2.650 0,10~0,11 | 2.000 0,10~0,11 | 1.510 0,07~0,08 |
| 8 | | 4.180 0,16~0,18 | 4.780 0,16~0,18 | 3.600 0,16~0,18 | 2.000 0,12~0,13 | 1.700 0,12~0,13 | 2.000 0,12~0,13 | 1.500 0,12~0,13 | 1.130 0,09~0,10 |
| 10 | | 3.350 0,19~0,20 | 3.820 0,19~0,20 | 2.870 0,19~0,20 | 1.600 0,14~0,15 | 1.350 0,14~0,15 | 1.600 0,14~0,15 | 1.200 0,14~0,15 | 910 0,11~0,12 |
| 12 | | 2.790 0,21~0,23 | 3.180 0,21~0,23 | 2.400 0,21~0,23 | 1.330 0,16~0,17 | 1.130 0,16~0,17 | 1.330 0,16~0,17 | 1.000 0,16~0,17 | 760 0,13~0,14 |
| 14 | | 2.390 0,24~0,26 | 2.730 0,24~0,26 | 2.050 0,24~0,26 | 1.140 0,18~0,19 | 970 0,18~0,19 | 1.140 0,18~0,19 | 850 0,18~0,19 | 650 0,15~0,16 |
| 16 | | 2.090 0,27~0,29 | 2.390 0,27~0,29 | 1.800 0,27~0,29 | 1.000 0,20~0,21 | 850 0,20~0,21 | 1.000 0,20~0,21 | 750 0,20~0,21 | 570 0,17~0,18 |
| 18 | | 1.860 0,30~0,32 | 2.120 0,30~0,32 | 1.600 0,30~0,32 | 890 0,22~0,23 | 750 0,22~0,23 | 890 0,22~0,23 | 660 0,22~0,23 | 500 0,19~0,20 |
| 20 | | 1.670 0,33~0,35 | 1.910 0,33~0,35 | 1.440 0,33~0,35 | 800 0,24~0,25 | 680 0,24~0,25 | 800 0,24~0,25 | 600 0,24~0,25 | 450 0,21~0,22 |


| MAT | 320-325 | 1.4 (< 1000 N/mm ²) | 1.5 (< 1000 N/mm ²) | 2.1 / 2.2 | 2.3 / 2.4 | 3.1-3.4 | 4 | 5 (1000 ~ 1200 N/mm ²) | |
|------------------|---------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|---------------------------------------|------------------------------------|
| V _c | | 70 ~ 80 m/min | 70 ~ 80 m/min | 80 ~ 100 m/min | 70 ~ 80 m/min | 80 ~ 100 m/min | 200 ~ 240 m/min | 25 ~ 40 m/min | 20 ~ 35 m/min |
| d ₁ ∅ | [mm] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] | n f [min ⁻¹] [mm/U] |
| 2 | | 12.000 0,03~0,04 | 12.000 0,03~0,04 | 14.350 0,07~0,09 | 12.000 0,04~0,06 | 14.350 0,06~0,08 | 35.000 0,07~0,09 | 5.170 0,02~0,03 | 4.380 0,02~0,03 |
| 3 | | 8.000 0,04~0,06 | 8.000 0,04~0,06 | 9.600 0,10~0,12 | 8.000 0,07~0,08 | 9.600 0,10~0,12 | 23.350 0,10~0,12 | 3.450 0,03~0,05 | 2.920 0,03~0,05 |
| 4 | | 6.000 0,07~0,08 | 6.000 0,07~0,08 | 7.200 0,13~0,15 | 6.000 0,10~0,12 | 7.200 0,13~0,15 | 17.500 0,14~0,16 | 2.600 0,06~0,07 | 2.190 0,06~0,07 |
| 5 | | 4.800 0,08~0,09 | 4.800 0,08~0,09 | 5.750 0,15~0,17 | 4.800 0,12~0,14 | 5.750 0,15~0,17 | 14.000 0,18~0,20 | 2.070 0,08~0,09 | 1.750 0,08~0,09 |
| 6 | | 4.000 0,10~0,11 | 4.000 0,10~0,11 | 4.800 0,18~0,20 | 4.000 0,14~0,16 | 4.800 0,18~0,20 | 11.680 0,24~0,26 | 1.730 0,09~0,10 | 1.460 0,09~0,10 |
| 8 | | 3.000 0,12~0,13 | 3.000 0,12~0,13 | 3.600 0,21~0,24 | 3.000 0,16~0,18 | 3.600 0,21~0,24 | 8.750 0,26~0,28 | 1.300 0,11~0,12 | 1.100 0,11~0,12 |
| 10 | | 2.400 0,14~0,15 | 2.400 0,14~0,15 | 2.870 0,26~0,29 | 2.400 0,19~0,20 | 2.870 0,26~0,29 | 7.000 0,34~0,36 | 1.040 0,13~0,14 | 880 0,13~0,14 |
| 12 | | 2.000 0,16~0,17 | 2.000 0,16~0,17 | 2.400 0,30~0,32 | 2.000 0,21~0,23 | 2.400 0,30~0,32 | 5.850 0,38~0,40 | 860 0,15~0,16 | 730 0,15~0,16 |
| 14 | | 1.710 0,18~0,19 | 1.710 0,18~0,19 | 2.050 0,33~0,35 | 1.710 0,24~0,26 | 2.050 0,33~0,35 | 5.000 0,41~0,43 | 740 0,17~0,18 | 630 0,17~0,18 |
| 16 | | 1.500 0,20~0,21 | 1.500 0,20~0,21 | 1.800 0,36~0,38 | 1.500 0,27~0,29 | 1.800 0,36~0,38 | 4.380 0,44~0,46 | 650 0,19~0,20 | 550 0,19~0,20 |
| 18 | | 1.330 0,22~0,23 | 1.330 0,22~0,23 | 1.600 0,38~0,40 | 1.330 0,30~0,32 | 1.600 0,38~0,40 | 3.890 0,47~0,49 | 580 0,21~0,22 | 490 0,21~0,22 |
| 20 | | 1.200 0,24~0,25 | 1.200 0,24~0,25 | 1.440 0,41~0,44 | 1.200 0,33~0,35 | 1.440 0,41~0,44 | 3.500 0,50~0,52 | 520 0,23~0,24 | 440 0,23~0,24 |

| 024 008 | | VHM | Typ VA | IKZ | ≤8xd | TiAlN |  | | | | | | | | | | | |
|------------------|---------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|---|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|--|--|
| MAT | 320-325 | 1.1 | 1.2.3 | 1.2.1 / 1.2.2 / 1.2.4 / 1.3 | | 1.6.1 | 1.6.2 | 1.6.3 / 1.6.4 | | 1.6.5 | 1.6.6 | | | | | | | |
| V _c | | 70 ~ 90 m/min | 80 ~ 100 m/min | 65 ~ 85 m/min | | 40 ~ 55 m/min | 35 ~ 45 m/min | 40 ~ 55 m/min | | 30 ~ 40 m/min | 20 ~ 30 m/min | | | | | | | |
| d ₁ Ø | Ø | n f | n f | n f | | n f | n f | n f | | n f | n f | | | | | | | |
| [mm] | [mm] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | | |
| 2 | 2 | 12.730 0,04~0,06 | 14.350 0,04~0,06 | 12.000 0,04~0,06 | 7.560 0,03~0,04 | 6.370 0,03~0,04 | 7.560 0,03~0,04 | 5.570 0,03~0,04 | 3.980 0,02~0,03 | | | | | | | | | |
| 3 | 3 | 8.490 0,07~0,08 | 9.600 0,07~0,08 | 8.000 0,07~0,08 | 5.040 0,04~0,06 | 4.250 0,04~0,06 | 5.040 0,04~0,06 | 3.720 0,04~0,06 | 2.650 0,03~0,04 | | | | | | | | | |
| 4 | 4 | 6.370 0,10~0,12 | 7.200 0,10~0,12 | 6.000 0,10~0,12 | 3.780 0,07~0,08 | 3.180 0,07~0,08 | 3.780 0,07~0,08 | 2.790 0,07~0,08 | 2.000 0,05~0,06 | | | | | | | | | |
| 5 | 5 | 5.090 0,12~0,14 | 5.750 0,12~0,14 | 4.800 0,12~0,14 | 3.030 0,08~0,09 | 2.550 0,08~0,09 | 3.030 0,08~0,09 | 2.230 0,08~0,09 | 1.600 0,06~0,07 | | | | | | | | | |
| 6 | 6 | 4.240 0,14~0,16 | 4.800 0,14~0,16 | 4.000 0,14~0,16 | 2.520 0,10~0,11 | 2.120 0,10~0,11 | 2.520 0,10~0,11 | 1.860 0,10~0,11 | 1.330 0,07~0,08 | | | | | | | | | |
| 8 | 8 | 3.180 0,16~0,18 | 3.600 0,16~0,18 | 3.000 0,16~0,18 | 1.890 0,12~0,13 | 1.590 0,12~0,13 | 1.890 0,12~0,13 | 1.400 0,12~0,13 | 1.000 0,09~0,10 | | | | | | | | | |
| 10 | 10 | 2.550 0,19~0,20 | 2.870 0,19~0,20 | 2.400 0,19~0,20 | 1.510 0,14~0,15 | 1.270 0,14~0,15 | 1.510 0,14~0,15 | 1.120 0,14~0,15 | 800 0,11~0,12 | | | | | | | | | |
| 12 | 12 | 2.120 0,21~0,23 | 2.400 0,21~0,23 | 2.000 0,21~0,23 | 1.260 0,16~0,17 | 1.060 0,16~0,17 | 1.260 0,16~0,17 | 930 0,16~0,17 | 660 0,13~0,14 | | | | | | | | | |
| 14 | 14 | 1.820 0,24~0,26 | 2.050 0,24~0,26 | 1.700 0,24~0,26 | 1.080 0,18~0,19 | 910 0,18~0,19 | 1.080 0,18~0,19 | 800 0,18~0,19 | 570 0,15~0,16 | | | | | | | | | |
| 16 | 16 | 1.590 0,27~0,29 | 1.800 0,27~0,29 | 1.500 0,27~0,29 | 950 0,20~0,21 | 800 0,20~0,21 | 950 0,20~0,21 | 700 0,20~0,21 | 500 0,17~0,18 | | | | | | | | | |
| 18 | 18 | 1.410 0,30~0,32 | 1.600 0,30~0,32 | 1.330 0,30~0,32 | 840 0,22~0,23 | 710 0,22~0,23 | 840 0,22~0,23 | 620 0,22~0,23 | 440 0,19~0,20 | | | | | | | | | |
| 20 | 20 | 1.270 0,33~0,35 | 1.440 0,33~0,35 | 1.200 0,33~0,35 | 760 0,24~0,25 | 640 0,24~0,25 | 760 0,24~0,25 | 560 0,24~0,25 | 400 0,21~0,22 | | | | | | | | | |


| MAT | 320-325 | 1.4 (< 1000 N/mm ²) | 1.5 (< 1000 N/mm ²) | 2.1 / 2.2 | 2.3 / 2.4 | 5 | | | |
|------------------|---------|---------------------------------|---------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| V _c | | 60 ~ 70 m/min | 60 ~ 70 m/min | 70 ~ 90 m/min | 65 ~ 75 m/min | 25 ~ 35 m/min | 20 ~ 30 m/min | | |
| d ₁ Ø | Ø | n f | n f | n f | n f | n f | n f | | |
| [mm] | [mm] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] |
| 2 | 2 | 10.350 0,03~0,04 | 10.350 0,03~0,04 | 12.730 0,07~0,09 | 11.150 0,04~0,06 | 4.770 0,02~0,03 | 3.980 0,02~0,03 | | |
| 3 | 3 | 6.900 0,04~0,06 | 6.900 0,04~0,06 | 8.490 0,10~0,12 | 7.430 0,07~0,08 | 3.180 0,03~0,05 | 2.650 0,03~0,05 | | |
| 4 | 4 | 5.180 0,07~0,08 | 5.180 0,07~0,08 | 6.370 0,13~0,15 | 5.570 0,10~0,12 | 2.390 0,06~0,07 | 2.000 0,06~0,07 | | |
| 5 | 5 | 4.140 0,08~0,09 | 4.140 0,08~0,09 | 5.090 0,15~0,17 | 4.460 0,12~0,14 | 1.910 0,08~0,09 | 1.600 0,08~0,09 | | |
| 6 | 6 | 3.450 0,10~0,11 | 3.450 0,10~0,11 | 4.240 0,18~0,20 | 3.720 0,14~0,16 | 1.600 0,09~0,10 | 1.330 0,09~0,10 | | |
| 8 | 8 | 2.590 0,12~0,13 | 2.590 0,12~0,13 | 3.180 0,21~0,24 | 2.790 0,16~0,18 | 1.200 0,11~0,12 | 1.000 0,11~0,12 | | |
| 10 | 10 | 2.070 0,14~0,15 | 2.070 0,14~0,15 | 2.550 0,26~0,29 | 2.230 0,19~0,20 | 950 0,13~0,14 | 800 0,13~0,14 | | |
| 12 | 12 | 1.730 0,16~0,17 | 1.730 0,16~0,17 | 2.120 0,30~0,32 | 1.860 0,21~0,23 | 800 0,15~0,16 | 660 0,15~0,16 | | |
| 14 | 14 | 1.480 0,18~0,19 | 1.480 0,18~0,19 | 1.820 0,33~0,35 | 1.600 0,24~0,26 | 680 0,17~0,18 | 570 0,17~0,18 | | |
| 16 | 16 | 1.300 0,20~0,21 | 1.300 0,20~0,21 | 1.590 0,36~0,38 | 1.400 0,27~0,29 | 600 0,19~0,20 | 500 0,19~0,20 | | |
| 18 | 18 | 1.150 0,22~0,23 | 1.150 0,22~0,23 | 1.410 0,38~0,40 | 1.240 0,30~0,32 | 530 0,21~0,22 | 440 0,21~0,22 | | |
| 20 | 20 | 1.040 0,24~0,25 | 1.040 0,24~0,25 | 1.270 0,41~0,44 | 1.120 0,33~0,35 | 480 0,23~0,24 | 400 0,23~0,24 | | |

Einsatzbedingungen
Cutting conditions
Conditions d'utilisation
Condizioni d'uso

 Emulsion
Emulsion
Emulsion
Emulsione


 v_c x 1,05




| 024 012 | | VHM | Typ VA | IKZ | ≤12Xd | TiAIN |  | | | | | | | | | | | |
|------------------|---------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|---|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|--|--|
| MAT | 320-325 | 1.1 | 1.2.3 | 1.2.1 / 1.2.2 / 1.2.4 / 1.3 | | 1.6.1 | 1.6.2 | 1.6.3 / 1.6.4 | | 1.6.5 | 1.6.6 | | | | | | | |
| V _c | | 70 ~ 80 m/min | 70 ~ 90 m/min | 60 ~ 80 m/min | | 40 ~ 50 m/min | 30 ~ 40 m/min | 40 ~ 50 m/min | | 25 ~ 35 m/min | 20 ~ 30 m/min | | | | | | | |
| d ₁ ∅ | ∅ | n f | n f | n f | | n f | n f | n f | | n f | n f | | | | | | | |
| [mm] | [mm] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | | |
| 2 | | 12.000 0,04~0,06 | 12.730 0,04~0,06 | 11.140 0,04~0,06 | | 7.160 0,03~0,04 | 5.570 0,03~0,04 | 7.160 0,03~0,04 | | 5.000 0,03~0,04 | 3.980 0,02~0,03 | | | | | | | |
| 3 | | 8.000 0,07~0,08 | 8.500 0,07~0,08 | 7.450 0,07~0,08 | | 4.780 0,04~0,06 | 3.720 0,04~0,06 | 4.780 0,04~0,06 | | 3.340 0,04~0,06 | 2.650 0,03~0,04 | | | | | | | |
| 4 | | 6.000 0,10~0,12 | 6.400 0,10~0,12 | 5.570 0,10~0,12 | | 3.580 0,07~0,08 | 2.790 0,07~0,08 | 3.580 0,07~0,08 | | 2.500 0,07~0,08 | 2.000 0,05~0,06 | | | | | | | |
| 5 | | 4.800 0,12~0,14 | 5.100 0,12~0,14 | 4.460 0,12~0,14 | | 2.870 0,08~0,09 | 2.230 0,08~0,09 | 2.870 0,08~0,09 | | 2.000 0,08~0,09 | 1.600 0,06~0,07 | | | | | | | |
| 6 | | 4.000 0,14~0,16 | 4.250 0,14~0,16 | 3.720 0,14~0,16 | | 2.400 0,10~0,11 | 1.860 0,10~0,11 | 2.400 0,10~0,11 | | 1.670 0,10~0,11 | 1.330 0,07~0,08 | | | | | | | |
| 8 | | 3.000 0,16~0,18 | 3.200 0,16~0,18 | 2.790 0,16~0,18 | | 1.800 0,12~0,13 | 1.400 0,12~0,13 | 1.800 0,12~0,13 | | 1.250 0,12~0,13 | 1.000 0,09~0,10 | | | | | | | |
| 10 | | 2.400 0,19~0,20 | 2.550 0,19~0,20 | 2.230 0,19~0,20 | | 1.430 0,14~0,15 | 1.120 0,14~0,15 | 1.430 0,14~0,15 | | 1.000 0,14~0,15 | 800 0,11~0,12 | | | | | | | |
| 12 | | 2.000 0,21~0,23 | 2.130 0,21~0,23 | 1.860 0,21~0,23 | | 1.200 0,16~0,17 | 930 0,16~0,17 | 1.200 0,16~0,17 | | 840 0,16~0,17 | 660 0,13~0,14 | | | | | | | |
| 14 | | 1.710 0,24~0,26 | 1.820 0,24~0,26 | 1.600 0,24~0,26 | | 1.030 0,18~0,19 | 800 0,18~0,19 | 1.030 0,18~0,19 | | 720 0,18~0,19 | 570 0,15~0,16 | | | | | | | |
| 16 | | 1.500 0,27~0,29 | 1.600 0,27~0,29 | 1.400 0,27~0,29 | | 900 0,20~0,21 | 700 0,20~0,21 | 900 0,20~0,21 | | 630 0,20~0,21 | 500 0,17~0,18 | | | | | | | |
| 18 | | 1.330 0,30~0,32 | 1.420 0,30~0,32 | 1.240 0,30~0,32 | | 800 0,22~0,23 | 620 0,22~0,23 | 800 0,22~0,23 | | 560 0,22~0,23 | 440 0,19~0,20 | | | | | | | |
| 20 | | 1.200 0,33~0,35 | 1.280 0,33~0,35 | 1.120 0,33~0,35 | | 720 0,24~0,25 | 560 0,24~0,25 | 720 0,24~0,25 | | 500 0,24~0,25 | 400 0,21~0,22 | | | | | | | |

| MAT | 320-325 | 1.4 (< 1000 N/mm ²) | 1.5 (< 1000 N/mm ²) | 2.1 / 2.2 | 2.3 / 2.4 | 5 | | | |
|------------------|---------|---------------------------------|---------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| V _c | | 50 ~ 60 m/min | 50 ~ 60 m/min | 70 ~ 80 m/min | 60 ~ 70 m/min | 20 ~ 30 m/min | | 15 ~ 25 m/min | |
| d ₁ ∅ | ∅ | n f | n f | n f | n f | n f | | n f | |
| [mm] | [mm] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] | [min ⁻¹] [mm/U] |
| 2 | | 8.760 0,03~0,04 | 8.760 0,03~0,04 | 12.000 0,07~0,09 | 10.350 0,04~0,06 | 3.980 0,02~0,03 | | 3.180 0,02~0,03 | |
| 3 | | 5.840 0,04~0,06 | 5.840 0,04~0,06 | 8.000 0,10~0,12 | 6.900 0,07~0,08 | 2.650 0,03~0,05 | | 2.120 0,03~0,04 | |
| 4 | | 4.380 0,07~0,08 | 4.380 0,07~0,08 | 6.000 0,13~0,15 | 5.180 0,10~0,12 | 2.000 0,06~0,07 | | 1.600 0,05~0,06 | |
| 5 | | 3.500 0,08~0,09 | 3.500 0,08~0,09 | 4.800 0,15~0,17 | 4.140 0,12~0,14 | 1.600 0,08~0,09 | | 1.270 0,06~0,07 | |
| 6 | | 2.920 0,10~0,11 | 2.920 0,10~0,11 | 4.000 0,18~0,20 | 3.450 0,14~0,16 | 1.330 0,09~0,10 | | 1.060 0,07~0,08 | |
| 8 | | 2.190 0,12~0,13 | 2.190 0,12~0,13 | 3.000 0,21~0,24 | 2.590 0,16~0,18 | 1.000 0,11~0,12 | | 800 0,09~0,10 | |
| 10 | | 1.750 0,14~0,15 | 1.750 0,14~0,15 | 2.400 0,26~0,29 | 2.070 0,19~0,20 | 800 0,13~0,14 | | 640 0,11~0,12 | |
| 12 | | 1.460 0,16~0,17 | 1.460 0,16~0,17 | 2.000 0,30~0,32 | 1.730 0,21~0,23 | 660 0,15~0,16 | | 530 0,13~0,14 | |
| 14 | | 1.250 0,18~0,19 | 1.250 0,18~0,19 | 1.710 0,33~0,35 | 1.480 0,24~0,26 | 570 0,17~0,18 | | 450 0,15~0,16 | |
| 16 | | 1.100 0,20~0,21 | 1.100 0,20~0,21 | 1.500 0,36~0,38 | 1.300 0,27~0,29 | 500 0,19~0,20 | | 400 0,17~0,18 | |
| 18 | | 970 0,22~0,23 | 970 0,22~0,23 | 1.330 0,38~0,40 | 1.150 0,30~0,32 | 440 0,21~0,22 | | 350 0,19~0,20 | |
| 20 | | 875 0,24~0,25 | 875 0,24~0,25 | 1.200 0,41~0,44 | 1.040 0,33~0,35 | 400 0,23~0,24 | | 320 0,21~0,22 | |

Einsatzbedingungen
Cutting conditions
Conditions d'utilisation
Condizioni d'uso

 Emulsion
Emulsion
Emulsion
Emulsione

 v_c x 1,05



025 020



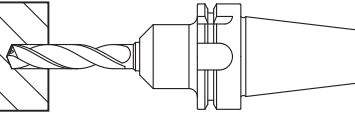
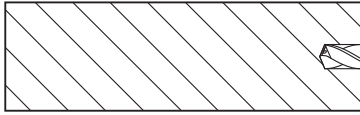
025 030



025 040

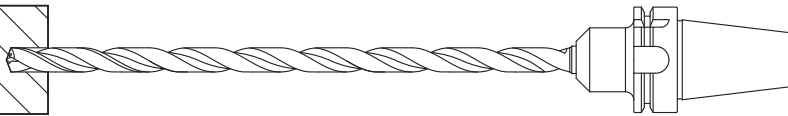
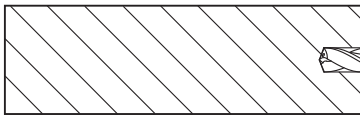


025 050



- ▶ Pilotbohrung erstellen mit WEXO-Spiralbohrer 024 005 – Typ VA ($\varnothing d1 + 0,02$ mm).
- ▶ Produce the pilote hole with WEXO drill 024 005 – Type VA ($\varnothing d1 + 0,02$ mm).
- ▶ Effectuer le perçage pilote (pré perçage) avec foret Wexo 024005 – type VA ($\varnothing d1 + 0,02$ mm).
- ▶ Eseguire foro pilota con punte WEXO 024 005 – Tipo VA ($\varnothing d1 + 0,02$ mm).

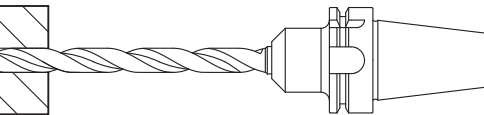
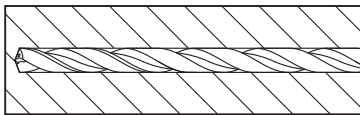
Die Bohrtiefe der Pilotbohrung muss mindestens 3 x d betragen.
The minimum depth of hole has to be 3 x d.
La profondeur du perçage pilote doit être au minimum 3 x d.
La profondita' del foro pilota deve essere minimo 3 x d.



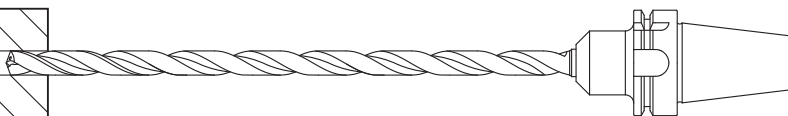
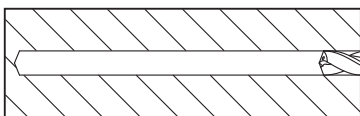
- ▶ Beim Eintritt des Tieflochbohrers in die Pilotbohrung sind die Schnittdaten wie folgt zu reduzieren:
- ▶ At the entrance of the deep hole drill into the pilot hole the cutting data must be reduced as follows:
- ▶ En entrent dans le perçage pilote avec le foret long il faut réduire les paramètres de coupe comme suit :
- ▶ Inserendo la punta nel foro pilota, i parametri di taglio vanno ridotti come segue:

| | | |
|--|----------------|-----------------------------|
| Drehzahl · Speed · Vitesse de rotation · Numero di giri | n | 300 ~ 400 min ⁻¹ |
| Vorschubgeschwindigkeit · Feed · Avance · Velocita' di avanzamento | v _f | 30 ~ 40 % |

- ▶ Vorschub ca. 2 ~ 3 mm vor Erreichen des Bohrungsgrundes der Pilotbohrung anhalten.
- ▶ Stop feed approx. 2 ~ 3 mm before reaching the ground of the pilot hole.
- ▶ Raise up speed n and feed v_f according the table and switch on the cooling.
- ▶ Stopper l'avance 2 ~ 3 mm avant le fond du perçage pilote.
- ▶ Augmenter la vitesse et l'avance selon le tableau et activer la lubrification.
- ▶ Avanzare ca. 2 ~ 3 mm per inserirsi a pieno nel foro pilota.
- ▶ Riportare i parametri di taglio ai loro valori originali ed accendere la lubrorefrigerazione.



- ▶ Die gewünschte Bohrtiefe ohne Entspannen herstellen.
- ▶ Produce the desired depth hole without lifting.
- ▶ Percer la profondeur voulue sans débouurer.
- ▶ Eseguire tutto il foro senza scaricare.




- ▶ Beim Ausfahren des Tieflochbohrers bis auf Tiefe der Pilotbohrung sind die Schnittdaten wie folgt zu reduzieren:
- ▶ During back out of the deep hole drill up to the depth of the pilot hole the cutting data must be reduced as follows:
- ▶ En sortant du trou avec le foret long jusqu'à la profondeur de perçage pilote il faut réduire les paramètres comme suit:
- ▶ Per estare la punta per fori profondi dal foro eseguito, ridurre i parametri come segue:






| | | |
|--|----------------|-----------------------------|
| Drehzahl · Speed · Vitesse de rotation · Numero di giri | n | 300 ~ 400 min ⁻¹ |
| Vorschubgeschwindigkeit · Feed · Avance · Velocita' di avanzamento | v _f | 60 % |





- ▶ Komplette Herausfahren aus der Bohrung mit normalem Eilgang der Maschine.
- ▶ Completely back out with regular rapid feed of the machine.
- ▶ Sortir complètement du trou avec l'avance rapide de la machine.
- ▶ Per ritornare in posizione di partenza utilizzare il normale avanzamento della macchina.

- ▶ Bei der Herstellung von Durchgangsbohrungen sollte der Vorschub vor dem Austritt um 50% reduziert werden, um Ausbrüche an den Schneidenecken zu vermeiden.
- ▶ If producing through holes the feed should be reduced at 50% before exit, to prevent chipping on the cutting edges.
- ▶ En perçant des trous passants il faut réduire l'avance avant la sortie de 50%, ceci pour éviter des éclatements aux tranchants.
- ▶ Per eseguire fori passanti, la velocita' di avanzamento in uscita va ridotta del 50% per evitare la scheggiatura del tagliente.


- ▶  Als Kühlmittel sollte Emulsion verwendet werden (Kühlmitteldruck min. 30 bar, d1 ≤ 5,0 mm Kühlmitteldruck max. 35 bar).
- ▶ As coolant please use emulsion (coolant pressure min. 30 bar, d1 ≤ 5,0 mm coolant pressure max. 35 bar).
- ▶ Il est nécessaire de lubrifier avec de l'emulsion (Pression minimale 30 bars, d1 ≤ 5,0 mm pression max. 35 bar).
- ▶ Il lubrificante consigliato e l' emulsione (pressione minima 30 bar, d1 ≤ 5,0 mm pressione max. 35 bar).





| 025 020 | | VHM | Typ VA | IKZ | ≤20xd | TiAlN |  | | | | | | | | | | |
|---|---|----------------------|-----------|----------------------|-----------|-----------------------------|---|-----------------------------|-----------|-----------------------------|-----------|----------------------|-----------|----------------------|-----------|----------------------|-----------|
| MAT  |  | 1.1 | | 1.2.3 | | 1.2.1 / 1.2.2 / 1.2.4 / 1.3 | | 1.4 | | 1.5 | | 2.1-2.3 | | | | | |
| | | | | | | | | (< 1000 N/mm ²) | | (< 1000 N/mm ²) | | | | | | | |
|  |  | 80 ~ 100 m/min | | 85 ~ 105 m/min | | 75 ~ 95 m/min | | 70 ~ 80 m/min | | 50 ~ 65 m/min | | 65 ~ 80 m/min | | 50 ~ 65 m/min | | 80 ~ 90 m/min | |
| | | n | f | n | f | n | f | n | f | n | f | n | f | n | f | n | f |
| | | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] |
| 3 | | 9.550 | 0,05~0,07 | 10.080 | 0,05~0,07 | 9.020 | 0,05~0,07 | 7.960 | 0,05~0,07 | 6.100 | 0,04~0,06 | 7.690 | 0,04~0,06 | 6.100 | 0,04~0,06 | 9.020 | 0,09~0,11 |
| 3,5 | | 8.190 | 0,06~0,08 | 8.640 | 0,06~0,08 | 7.730 | 0,06~0,08 | 6.820 | 0,06~0,08 | 5.230 | 0,05~0,07 | 6.600 | 0,05~0,07 | 5.230 | 0,05~0,07 | 7.730 | 0,10~0,13 |
| 4 | | 7.160 | 0,07~0,09 | 7.560 | 0,07~0,09 | 6.770 | 0,07~0,09 | 5.970 | 0,07~0,09 | 4.580 | 0,06~0,08 | 5.770 | 0,06~0,08 | 4.580 | 0,06~0,08 | 6.770 | 0,12~0,15 |
| 4,5 | | 6.370 | 0,08~0,10 | 6.720 | 0,08~0,10 | 6.020 | 0,08~0,10 | 5.310 | 0,08~0,10 | 4.070 | 0,07~0,09 | 5.130 | 0,07~0,09 | 4.070 | 0,07~0,09 | 6.020 | 0,14~0,17 |
| 5 | | 5.730 | 0,09~0,11 | 6.050 | 0,09~0,11 | 5.410 | 0,09~0,11 | 4.780 | 0,09~0,11 | 3.660 | 0,07~0,10 | 4.620 | 0,07~0,10 | 3.660 | 0,07~0,10 | 5.420 | 0,15~0,19 |
| 5,5 | | 5.210 | 0,10~0,12 | 5.500 | 0,10~0,12 | 4.920 | 0,10~0,12 | 4.340 | 0,10~0,12 | 3.330 | 0,08~0,11 | 4.200 | 0,08~0,11 | 3.330 | 0,08~0,11 | 4.920 | 0,17~0,21 |
| 6 | | 4.780 | 0,11~0,14 | 5.040 | 0,11~0,14 | 4.510 | 0,11~0,14 | 3.980 | 0,11~0,14 | 3.050 | 0,09~0,12 | 3.850 | 0,09~0,12 | 3.050 | 0,09~0,12 | 4.510 | 0,18~0,23 |
| 6,5 | | 4.410 | 0,12~0,15 | 4.650 | 0,12~0,15 | 4.170 | 0,12~0,15 | 3.670 | 0,12~0,15 | 2.820 | 0,10~0,13 | 3.550 | 0,10~0,13 | 2.820 | 0,10~0,13 | 4.170 | 0,20~0,25 |
| 7 | | 4.090 | 0,13~0,16 | 4.320 | 0,13~0,16 | 3.870 | 0,13~0,16 | 3.410 | 0,13~0,16 | 2.620 | 0,11~0,14 | 3.300 | 0,11~0,14 | 2.620 | 0,11~0,14 | 3.870 | 0,21~0,26 |
| 8 | | 3.580 | 0,14~0,17 | 3.780 | 0,14~0,17 | 3.390 | 0,14~0,17 | 2.990 | 0,14~0,17 | 2.290 | 0,12~0,15 | 2.890 | 0,12~0,15 | 2.290 | 0,12~0,15 | 3.390 | 0,23~0,28 |
| 8,5 | | 3.370 | 0,15~0,18 | 3.560 | 0,15~0,18 | 3.190 | 0,15~0,18 | 2.810 | 0,15~0,18 | 2.160 | 0,13~0,17 | 2.720 | 0,13~0,17 | 2.160 | 0,13~0,17 | 3.190 | 0,24~0,29 |
| 10 | | 2.870 | 0,18~0,21 | 3.030 | 0,18~0,21 | 2.710 | 0,18~0,21 | 2.390 | 0,18~0,21 | 1.830 | 0,14~0,18 | 2.310 | 0,14~0,18 | 1.830 | 0,14~0,18 | 2.710 | 0,25~0,30 |
| 12 | | 2.390 | 0,21~0,25 | 2.520 | 0,21~0,25 | 2.260 | 0,21~0,25 | 1.990 | 0,21~0,25 | 1.530 | 0,16~0,20 | 1.930 | 0,16~0,20 | 1.530 | 0,16~0,20 | 2.260 | 0,30~0,36 |

| MAT  |  | 1.6.1 | | 1.6.2 | | 1.6.3 / 1.6.4 | | 1.6.5 | |
|---|---|----------------------|-----------|----------------------|-----------|----------------------|-----------|----------------------|-----------|
|  |  | 50 ~ 60 m/min | | 30 ~ 45 m/min | | 50 ~ 60 m/min | | 30 ~ 40 m/min | |
| | | n | f | n | f | n | f | n | f |
| | | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] |
| 3 | | 8.760 | 0,03~0,04 | 8.760 | 0,03~0,04 | 12.000 | 0,07~0,09 | 10.350 | 0,04~0,06 |
| 3,5 | | 5.840 | 0,04~0,06 | 5.840 | 0,04~0,06 | 8.000 | 0,10~0,12 | 6.900 | 0,07~0,08 |
| 4 | | 4.380 | 0,07~0,08 | 4.380 | 0,07~0,08 | 6.000 | 0,13~0,15 | 5.180 | 0,10~0,12 |
| 4,5 | | 3.500 | 0,08~0,09 | 3.500 | 0,08~0,09 | 4.800 | 0,15~0,17 | 4.140 | 0,12~0,14 |
| 5 | | 2.920 | 0,10~0,11 | 2.920 | 0,10~0,11 | 4.000 | 0,18~0,20 | 3.450 | 0,14~0,16 |
| 5,5 | | 3.500 | 0,08~0,09 | 3.500 | 0,08~0,09 | 4.800 | 0,15~0,17 | 4.140 | 0,12~0,14 |
| 6 | | 2.920 | 0,10~0,11 | 2.920 | 0,10~0,11 | 4.000 | 0,18~0,20 | 3.450 | 0,14~0,16 |
| 6,5 | | 2.190 | 0,12~0,13 | 2.190 | 0,12~0,13 | 3.000 | 0,21~0,24 | 2.590 | 0,16~0,18 |
| 7 | | 1.750 | 0,14~0,15 | 1.750 | 0,14~0,15 | 2.400 | 0,26~0,29 | 2.070 | 0,19~0,20 |
| 8 | | 1.460 | 0,16~0,17 | 1.460 | 0,16~0,17 | 2.000 | 0,30~0,32 | 1.730 | 0,21~0,23 |
| 8,5 | | 1.250 | 0,18~0,19 | 1.250 | 0,18~0,19 | 1.710 | 0,33~0,35 | 1.480 | 0,24~0,26 |
| 10 | | 1.100 | 0,20~0,21 | 1.100 | 0,20~0,21 | 1.500 | 0,36~0,38 | 1.300 | 0,27~0,29 |
| 12 | | 970 | 0,22~0,23 | 970 | 0,22~0,23 | 1.330 | 0,38~0,40 | 1.150 | 0,30~0,32 |

Einsatzbedingungen
Cutting conditions
Conditions d'utilisation
Condizioni d'uso

 285

| 025 030 | | VHM | | Typ VA | | IKZ | | ≤30xd | | TiAlN | |  | | | | | |
|----------------|---------|----------------------|---------------|----------------------|---------------|-----------------------------|---------------|----------------------|---------------|----------------------|---------------|---|---------------|----------------------|---------------|-------|---------------|
| MAT | 320-325 | 1.1 | | 1.2.3 | | 1.2.1 / 1.2.2 / 1.2.4 / 1.3 | | 1.4 | | 1.5 | | 2.1-2.3 | | | | | |
| | | | | | | | | < 1000 N/mm² | | (1000 ~ 1200 N/mm²) | | < 1000 N/mm² | | (1000 ~ 1200 N/mm²) | | | |
| d ₁ | ∅ | V _c | | V _c | | V _c | | V _c | | V _c | | V _c | | V _c | | | |
| | | n | f | n | f | n | f | n | f | n | f | n | f | n | f | | |
| [mm] | | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | | |
| 3 | | 9.290 | 0,05~ 0,07 | 9.550 | 0,05~ 0,07 | 8.750 | 0,05~ 0,07 | 6.900 | 0,05~ 0,07 | 5.840 | 0,04~ 0,06 | 6.900 | 0,04~ 0,06 | 5.840 | 0,04~ 0,06 | 7.960 | 0,09~ 0,11 |
| 4 | | 6.970 | 0,07~ 0,09 | 7.160 | 0,07~ 0,09 | 6.570 | 0,07~ 0,09 | 5.170 | 0,07~ 0,09 | 4.380 | 0,06~ 0,08 | 5.180 | 0,06~ 0,08 | 4.380 | 0,06~ 0,08 | 5.970 | 0,12~ 0,15 |
| 5 | | 5.570 | 0,09~ 0,11 | 5.730 | 0,09~ 0,11 | 5.250 | 0,09~ 0,11 | 4.140 | 0,09~ 0,11 | 3.500 | 0,07~ 0,10 | 4.140 | 0,07~ 0,10 | 3.500 | 0,07~ 0,10 | 4.780 | 0,15~ 0,19 |
| 5,5 | | 5.070 | 0,10~ 0,12 | 5.210 | 0,10~ 0,12 | 4.780 | 0,10~ 0,12 | 3.760 | 0,10~ 0,12 | 3.180 | 0,08~ 0,11 | 3.450 | 0,08~ 0,11 | 3.180 | 0,08~ 0,11 | 4.340 | 0,17~ 0,21 |
| 6 | | 4.650 | 0,11~ 0,14 | 4.780 | 0,11~ 0,14 | 4.380 | 0,11~ 0,14 | 3.450 | 0,11~ 0,14 | 2.920 | 0,09~ 0,12 | 2.590 | 0,09~ 0,12 | 2.920 | 0,09~ 0,12 | 3.980 | 0,18~ 0,23 |
| 6,5 | | 4.290 | 0,12~ 0,15 | 4.410 | 0,12~ 0,15 | 4.040 | 0,12~ 0,15 | 3.190 | 0,12~ 0,15 | 2.700 | 0,10~ 0,13 | 2.070 | 0,10~ 0,13 | 2.700 | 0,10~ 0,13 | 3.670 | 0,20~ 0,25 |
| 7 | | 3.980 | 0,13~ 0,16 | 4.090 | 0,13~ 0,16 | 3.750 | 0,13~ 0,16 | 2.960 | 0,13~ 0,16 | 2.500 | 0,11~ 0,14 | 1.730 | 0,11~ 0,14 | 2.500 | 0,11~ 0,14 | 3.410 | 0,21~ 0,26 |
| 8 | | 3.490 | 0,14~ 0,17 | 3.580 | 0,14~ 0,17 | 3.290 | 0,14~ 0,17 | 2.590 | 0,14~ 0,17 | 2.190 | 0,12~ 0,15 | 1.480 | 0,12~ 0,15 | 2.190 | 0,12~ 0,15 | 2.990 | 0,23~ 0,28 |
| 10 | | 2.790 | 0,18~ 0,21 | 2.870 | 0,18~ 0,21 | 2.630 | 0,18~ 0,21 | 2.070 | 0,18~ 0,21 | 1.750 | 0,14~ 0,18 | 1.300 | 0,14~ 0,18 | 1.750 | 0,14~ 0,18 | 2.390 | 0,25~ 0,30 |
| 12 | | 2.320 | 0,21~ 0,25 | 2.390 | 0,21~ 0,25 | 2.190 | 0,21~ 0,25 | 1.730 | 0,21~ 0,25 | 1.490 | 0,16~ 0,20 | 1.150 | 0,16~ 0,20 | 1.490 | 0,16~ 0,20 | 1.990 | 0,30~ 0,36 |

| MAT | | 1.6.1 | | 1.6.2 | | 1.6.3 / 1.6.4 | | 1.6.5 | | Einsatzbedingungen Cutting conditions Conditions d'utilisation Condizioni d'uso  285 | | | | | | | |
|----------------|---|----------------------|---------------|----------------------|---------------|----------------------|---------------|----------------------|---------------|--|--|--|--|--|--|--|--|
| 320-325 | | 45 ~ 55 m/min | | 30 ~ 40 m/min | | 45 ~ 55 m/min | | 28 ~ 32 m/min | | | | | | | | | |
| V _c | | V _c | | V _c | | V _c | | V _c | | | | | | | | | |
| d ₁ | ∅ | n | f | n | f | n | f | n | f | | | | | | | | |
| [mm] | | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | | | | | | | | |
| 3 | | 5.300 | 0,04~ 0,06 | 3.720 | 0,04~ 0,06 | 5.300 | 0,04~ 0,06 | 3.350 | 0,04~ 0,06 | | | | | | | | |
| 4 | | 3.980 | 0,06~ 0,08 | 2.790 | 0,06~ 0,08 | 3.980 | 0,06~ 0,08 | 2.510 | 0,06~ 0,08 | | | | | | | | |
| 5 | | 3.190 | 0,07~ 0,10 | 2.230 | 0,07~ 0,10 | 3.190 | 0,07~ 0,10 | 2.010 | 0,07~ 0,10 | | | | | | | | |
| 5,5 | | 2.900 | 0,08~ 0,11 | 2.030 | 0,08~ 0,11 | 2.900 | 0,08~ 0,11 | 1.830 | 0,08~ 0,11 | | | | | | | | |
| 6 | | 2.650 | 0,09~ 0,12 | 1.860 | 0,09~ 0,12 | 2.650 | 0,09~ 0,12 | 1.680 | 0,09~ 0,12 | | | | | | | | |
| 6,5 | | 2.450 | 0,10~ 0,13 | 1.720 | 0,10~ 0,13 | 2.450 | 0,10~ 0,13 | 1.550 | 0,10~ 0,13 | | | | | | | | |
| 7 | | 2.280 | 0,11~ 0,14 | 1.600 | 0,11~ 0,14 | 2.280 | 0,11~ 0,14 | 1.440 | 0,11~ 0,14 | | | | | | | | |
| 8 | | 1.990 | 0,12~ 0,15 | 1.400 | 0,12~ 0,15 | 1.990 | 0,12~ 0,15 | 1.260 | 0,12~ 0,15 | | | | | | | | |
| 10 | | 1.590 | 0,14~ 0,18 | 1.120 | 0,14~ 0,18 | 1.590 | 0,14~ 0,18 | 1.010 | 0,14~ 0,18 | | | | | | | | |
| 12 | | 1.330 | 0,16~ 0,20 | 930 | 0,16~ 0,20 | 1.330 | 0,16~ 0,20 | 840 | 0,16~ 0,20 | | | | | | | | |

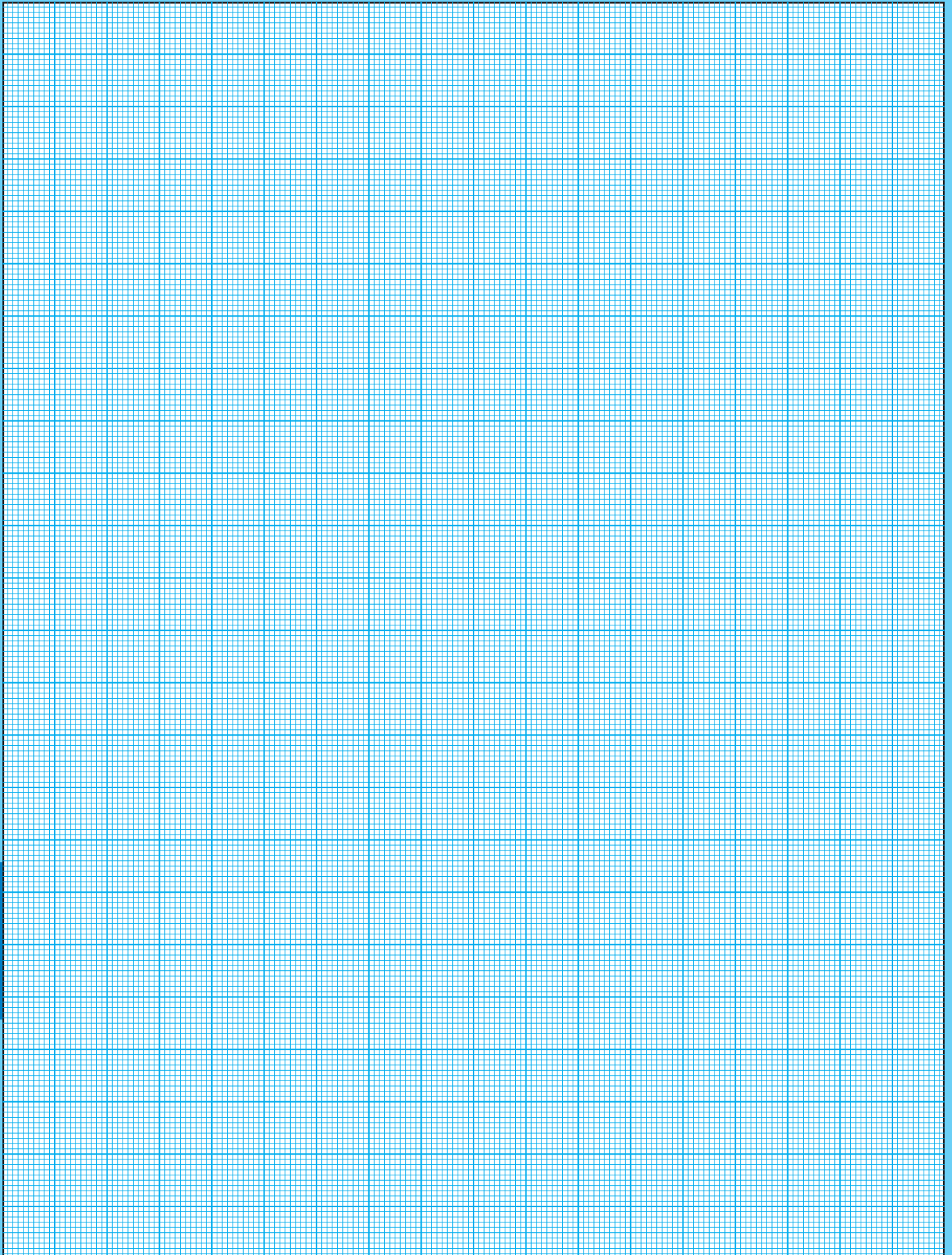


| | | | | | | | | | | | | | | | | | | | | | |
|---|----------------------|-----------|----------------------|-----------|----------------------|-----------|-----------------------------|-----------|----------------------|-----------|--|-----------|----------------------|-----------|----------------------|----------------------|--------|----------------------|--------|----------------------|--------|
| 025 040 | | | | | | | | | | | | | | | | | | | | | |
| | | | 1.1 | | 1.2.3 | | 1.2.1 / 1.2.2 / 1.2.4 / 1.3 | | 1.4 | | 1.5 | | 2.1-2.3 | | | | | | | | |
| | | | | | | | | | < 1000 N/mm² | | (1000 ~ 1200 N/mm²) | | < 1000 N/mm² | | (1000 ~ 1200 N/mm²) | | | | | | |
| | 65 ~ 75 m/min | | 70 ~ 80 m/min | | 60 ~ 70 m/min | | 50 ~ 60 m/min | | 45 ~ 55 m/min | | 50 ~ 60 m/min | | 45 ~ 55 m/min | | 60 ~ 70 m/min | | | | | | |
| $d_1 \begin{matrix} \text{Ø} \\ \text{[mm]} \end{matrix}$ | n | f | n | f | n | f | n | f | n | f | n | f | n | f | n | f | | | | | |
| | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | | | | | |
| 3 | 7.430 | 0,05~0,07 | 7.960 | 0,05~0,07 | 6.900 | 0,05~0,07 | 6.100 | 0,05~0,07 | 5.300 | 0,04~0,06 | 6.100 | 0,04~0,06 | 5.300 | 0,04~0,06 | 6.900 | 0,07~0,10 | | | | | |
| 4 | 5.570 | 0,07~0,09 | 5.970 | 0,07~0,09 | 5.180 | 0,07~0,09 | 4.580 | 0,07~0,09 | 3.980 | 0,06~0,08 | 4.580 | 0,06~0,08 | 3.980 | 0,06~0,08 | 5.180 | 0,09~0,13 | | | | | |
| 5 | 4.460 | 0,09~0,11 | 4.780 | 0,09~0,11 | 4.140 | 0,09~0,11 | 3.660 | 0,09~0,11 | 3.190 | 0,07~0,10 | 3.660 | 0,07~0,10 | 3.190 | 0,07~0,10 | 4.140 | 0,12~0,16 | | | | | |
| 6 | 3.720 | 0,11~0,14 | 3.980 | 0,11~0,14 | 3.450 | 0,11~0,14 | 3.050 | 0,11~0,14 | 2.650 | 0,09~0,12 | 3.050 | 0,09~0,12 | 2.650 | 0,09~0,12 | 3.450 | 0,15~0,19 | | | | | |
| 7 | 3.180 | 0,13~0,16 | 3.410 | 0,13~0,16 | 2.960 | 0,13~0,16 | 2.620 | 0,13~0,16 | 2.280 | 0,11~0,14 | 2.620 | 0,11~0,14 | 2.280 | 0,11~0,14 | 2.960 | 0,17~0,21 | | | | | |
| 8 | 2.790 | 0,14~0,17 | 2.990 | 0,14~0,17 | 2.590 | 0,14~0,17 | 2.290 | 0,14~0,17 | 1.990 | 0,12~0,15 | 2.290 | 0,12~0,15 | 1.990 | 0,12~0,15 | 2.590 | 0,19~0,23 | | | | | |
| 9 | 2.480 | 0,15~0,18 | 2.650 | 0,15~0,18 | 2.300 | 0,15~0,18 | 2.150 | 0,15~0,18 | 1.770 | 0,13~0,16 | 2.150 | 0,13~0,16 | 1.770 | 0,13~0,16 | 2.300 | 0,21~0,25 | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | 1.6.1 | | 1.6.2 | | 1.6.3 / 1.6.4 | | 1.6.5 | | Einsatzbedingungen Cutting conditions Conditions d'utilisation Condizioni d'uso | | | | | | | | | | |
| | 45 ~ 55 m/min | | 30 ~ 40 m/min | | 45 ~ 55 m/min | | 28 ~ 32 m/min | | | | | | | | | | | | | | |
| $d_1 \begin{matrix} \text{Ø} \\ \text{[mm]} \end{matrix}$ | n | f | n | f | n | f | n | f | n | f | | | | | | n | f | n | f | n | f |
| | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | | | | | | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] | [min ⁻¹] | [mm/U] |
| 3 | 5.300 | 0,03~0,05 | 3.720 | 0,03~0,05 | 5.300 | 0,03~0,05 | 3.350 | 0,03~0,05 | | | | | | | | | | | | | |
| 4 | 3.980 | 0,04~0,06 | 2.790 | 0,04~0,06 | 3.980 | 0,04~0,06 | 2.510 | 0,04~0,06 | | | | | | | | | | | | | |
| 5 | 3.190 | 0,05~0,07 | 2.230 | 0,05~0,07 | 3.190 | 0,05~0,07 | 2.010 | 0,05~0,07 | | | | | | | | | | | | | |
| 6 | 2.650 | 0,06~0,08 | 1.860 | 0,06~0,08 | 2.650 | 0,06~0,08 | 1.680 | 0,06~0,08 | | | | | | | | | | | | | |
| 7 | 2.280 | 0,07~0,09 | 1.600 | 0,07~0,09 | 2.280 | 0,07~0,09 | 1.440 | 0,07~0,09 | | | | | | | | | | | | | |
| 8 | 1.990 | 0,08~0,10 | 1.400 | 0,08~0,10 | 1.990 | 0,08~0,10 | 1.260 | 0,08~0,10 | | | | | | | | | | | | | |
| 9 | 1.770 | 0,09~0,11 | 1.240 | 0,09~0,11 | 1.770 | 0,09~0,11 | 1.060 | 0,09~0,11 | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |









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Fräser / End mills / Fraises / Frese



| | | |
|---|---|---|
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Index selon références

Catalogue number overview
Indice dei Numeri di Catalogo

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|--|---|---|--|---|---|--|---|---|
| 427 110 | 295 | – | 444 760 | 297 | – | 544 184 | 301 | 308 |
| 427 310 | 295 | – | 444 780 | 297 | – | 544 364 | 303 | 313-314 |
| 444 160 | 296 | – | 444 860 | 298 | – | 544 365 | 303 | 315 |
| 444 180 | 296 | – | 444 880 | 298 | – | 544 864 | 302 | 309-310 |
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| 444 680 | 299 | – | 544 164 | 301 | 306-307 | | | |

Katalog-Nr.
Catalogue no.
Catalogue n°
Nr. di catalogo



Bohrnutenfräser
Fraises

Slot drills
Frese per cave



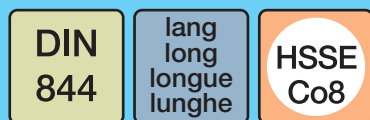
| | | | | | | | | | | |
|---------|--|-------|--|---------------|------------------------|------------------------|-----------------------------|---------------|--------------------|-----|
| 427 110 | | Typ N | | DIN 1835 B | d ₁ = e8 | d ₂ = h6 | ≤ 1200 N/mm ² | FUTURA | Ø 1,0 – 22,0 mm | 295 |
| 427 310 | | Typ N | | DIN 1835 B | d ₁ = e8 | d ₂ = h6 | ≤ 1200 N/mm ² | FUTURA | Ø 1,8 – 21,7 mm | 295 |

Schaftfräser
Fraises

End mills
Frese a candela



| | | | | | | | | | | |
|---------|--|--------|--|---------------|--------------------------|------------------------|-----------------------------|---------------|--------------------|-----|
| 444 160 | | Typ N | | DIN 1835 B | d ₁ = k10 | d ₂ = h6 | ≤ 1200 N/mm ² | FUTURA | Ø 2,0 – 30,0 mm | 296 |
| 444 760 | | Typ NF | | DIN 1835 B | d ₁ = js14 | d ₂ = h6 | ≤ 1200 N/mm ² | FUTURA | Ø 6,0 – 25,0 mm | 297 |
| 444 860 | | Typ HR | | DIN 1835 B | d ₁ = js14 | d ₂ = h6 | ≤ 1200 N/mm ² | FUTURA | Ø 6,0 – 30,0 mm | 298 |
| 444 660 | | Typ NR | | DIN 1835 B | d ₁ = js14 | d ₂ = h6 | ≤ 1200 N/mm ² | FUTURA | Ø 6,0 – 30,0 mm | 299 |



| | | | | | | | | | | |
|---------|--|--------|--|---------------|--------------------------|------------------------|-----------------------------|---------------|---------------------|-----|
| 444 180 | | Typ N | | DIN 1835 B | d ₁ = js14 | d ₂ = h6 | ≤ 1200 N/mm ² | FUTURA | Ø 3,0 – 30,0 mm | 296 |
| 444 780 | | Typ NF | | DIN 1835 B | d ₁ = js14 | d ₂ = h6 | ≤ 1200 N/mm ² | FUTURA | Ø 10,0 – 30,0 mm | 297 |
| 444 880 | | Typ HR | | DIN 1835 B | d ₁ = js14 | d ₂ = h6 | ≤ 1200 N/mm ² | FUTURA | Ø 6,0 – 30,0 mm | 298 |
| 444 680 | | Typ NR | | DIN 1835 B | d ₁ = js14 | d ₂ = h6 | ≤ 1200 N/mm ² | FUTURA | Ø 6,0 – 30,0 mm | 299 |



Katalog-Nr.
Catalogue no.
Catalogue n°
Nr. di catalogo



Bohrnutenfräser
Fraises

Slot drills
Frese per cave

DIN 327 kurz short courte corte PS 105

| | | | | | | | | | | |
|---------|--|-------|--|------------|---------------------|---------------------|----------|---------------|-----------------|-----|
| 527 114 | | Typ N | | DIN 1835 B | d ₁ = e8 | d ₂ = h6 | ≤ 45 HRC | FUTURA | Ø 3,0 – 20,0 mm | 300 |
|---------|--|-------|--|------------|---------------------|---------------------|----------|---------------|-----------------|-----|

Schafffräser
Fraises

End mills
Frese a candela

DIN 844 kurz short courte corte PS 105

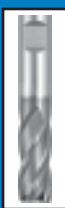
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|---------|--|-----------|--|------------|-----------------------|---------------------|----------|---------------|-----------------|-----|
| 544 164 | | Typ N | | DIN 1835 B | d ₁ = k10 | d ₂ = h6 | ≤ 45 HRC | FUTURA | Ø 6,0 – 20,0 mm | 301 |
| 544 864 | | Typ HR | | DIN 1835 B | d ₁ = js14 | d ₂ = h6 | ≤ 45 HRC | FUTURA | Ø 6,0 – 20,0 mm | 302 |
| 544 364 | | Typ W/45° | | DIN 1835 B | d ₁ = e8 | d ₂ = h6 | ≤ 45 HRC | FUTURA | Ø 6,0 – 20,0 mm | 303 |

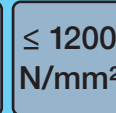
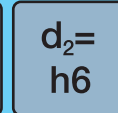
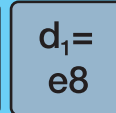
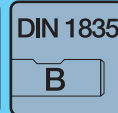
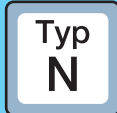
DIN 844 lang long longue lunghe PS 105

| | | | | | | | | | | |
|---------|--|--------|--|------------|-----------------------|---------------------|----------|---------------|-----------------|-----|
| 544 184 | | Typ N | | DIN 1835 B | d ₁ = k10 | d ₂ = h6 | ≤ 45 HRC | FUTURA | Ø 6,0 – 20,0 mm | 301 |
| 544 884 | | Typ HR | | DIN 1835 B | d ₁ = js14 | d ₂ = h6 | ≤ 45 HRC | FUTURA | Ø 6,0 – 20,0 mm | 302 |

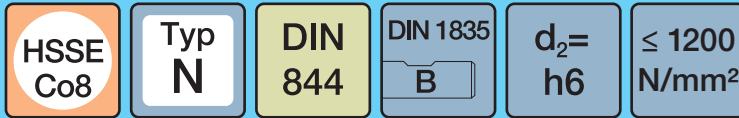
WEXO PS 105

| | | | | | | | | | | |
|---------|--|--------|--|------------|---------------------|---------------------|----------|---------------|-----------------|-----|
| 544 365 | | Typ VA | | DIN 1835 B | d ₁ = k9 | d ₂ = h6 | ≤ 45 HRC | FUTURA | Ø 4,0 – 25,0 mm | 303 |
|---------|--|--------|--|------------|---------------------|---------------------|----------|---------------|-----------------|-----|





| Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | 427 110 ⁵²⁰ FUTURA | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | 427 310 ⁵²⁰ FUTURA | |
|--|------------------------------|--|------------------------------|----------|--|------|--|------------------------------|--|------------------------------|----------|--|--|
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1; 2; 3.1-3.4; 4.1-4.4; 5; 6; 7 | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1; 2; 3.1-3.4; 4.1-4.4; 5; 6; 7 | |
| d₁ [mm] | l₂ [mm] | l₁ [mm] | d₂ [mm] | z | Code | | d₁ [mm] | l₂ [mm] | l₁ [mm] | d₂ [mm] | z | Code | |
| 1 | 3 | 47 | 6 | 2 | 470 000 | 1,8 | 4 | 48 | 6 | 3 | 470 450 | | |
| 1,5 | 3 | 47 | 6 | 2 | 470 001 | 2 | 4 | 48 | 6 | 3 | 470 401 | | |
| 2 | 4 | 48 | 6 | 2 | 470 002 | 2,5 | 5 | 49 | 6 | 3 | 470 402 | | |
| 2,5 | 5 | 49 | 6 | 2 | 470 003 | 2,8 | 5 | 49 | 6 | 3 | 470 449 | | |
| 3 | 5 | 49 | 6 | 2 | 470 004 | 3 | 5 | 49 | 6 | 3 | 470 403 | | |
| 3,5 | 6 | 50 | 6 | 2 | 470 005 | 3,5 | 6 | 50 | 6 | 3 | 470 404 | | |
| 4 | 7 | 51 | 6 | 2 | 470 006 | 3,8 | 7 | 51 | 6 | 3 | 470 451 | | |
| 4,5 | 7 | 51 | 6 | 2 | 470 007 | 4 | 7 | 51 | 6 | 3 | 470 405 | | |
| 5 | 8 | 52 | 6 | 2 | 470 008 | 4,8 | 8 | 52 | 6 | 3 | 470 452 | | |
| 5,5 | 8 | 52 | 6 | 2 | 470 009 | 5 | 8 | 52 | 6 | 3 | 470 407 | | |
| 6 | 8 | 52 | 6 | 2 | 470 010 | 5,5 | 8 | 52 | 6 | 3 | 470 408 | | |
| 6,5 | 10 | 60 | 10 | 2 | 470 011 | 5,75 | 8 | 52 | 6 | 3 | 470 453 | | |
| 7 | 10 | 60 | 10 | 2 | 470 012 | 6 | 8 | 52 | 6 | 3 | 470 409 | | |
| 8 | 11 | 61 | 10 | 2 | 470 014 | 7 | 10 | 60 | 10 | 3 | 470 411 | | |
| 8,5 | 11 | 61 | 10 | 2 | 470 015 | 7,75 | 11 | 61 | 10 | 3 | 470 454 | | |
| 10 | 13 | 63 | 10 | 2 | 470 018 | 8 | 11 | 61 | 10 | 3 | 470 413 | | |
| 11 | 13 | 70 | 12 | 2 | 470 019 | 9,7 | 13 | 63 | 10 | 3 | 470 455 | | |
| 12 | 16 | 73 | 12 | 2 | 470 020 | 10 | 13 | 63 | 10 | 3 | 470 417 | | |
| 13 | 16 | 73 | 12 | 2 | 470 021 | 11,7 | 13 | 70 | 12 | 3 | 470 456 | | |
| 14 | 16 | 73 | 12 | 2 | 470 022 | 12 | 16 | 73 | 12 | 3 | 470 419 | | |
| 15 | 16 | 73 | 12 | 2 | 470 023 | 13,7 | 16 | 73 | 12 | 3 | 470 457 | | |
| 16 | 19 | 79 | 16 | 2 | 470 024 | 14 | 16 | 73 | 12 | 3 | 470 421 | | |
| 18 | 19 | 79 | 16 | 2 | 470 026 | 15 | 16 | 73 | 12 | 3 | 470 422 | | |
| 20 | 22 | 88 | 20 | 2 | 470 028 | 15,7 | 19 | 79 | 16 | 3 | 470 458 | | |
| 22 | 22 | 88 | 20 | 2 | 470 030 | 16 | 19 | 79 | 16 | 3 | 470 423 | | |
| | | | | | | 17,7 | 19 | 79 | 16 | 3 | 470 459 | | |
| | | | | | | 18 | 19 | 79 | 16 | 3 | 470 425 | | |
| | | | | | | 19,7 | 22 | 88 | 20 | 3 | 470 460 | | |
| | | | | | | 20 | 22 | 88 | 20 | 3 | 470 427 | | |
| | | | | | | 21,7 | 22 | 88 | 20 | 3 | 470 461 | | |



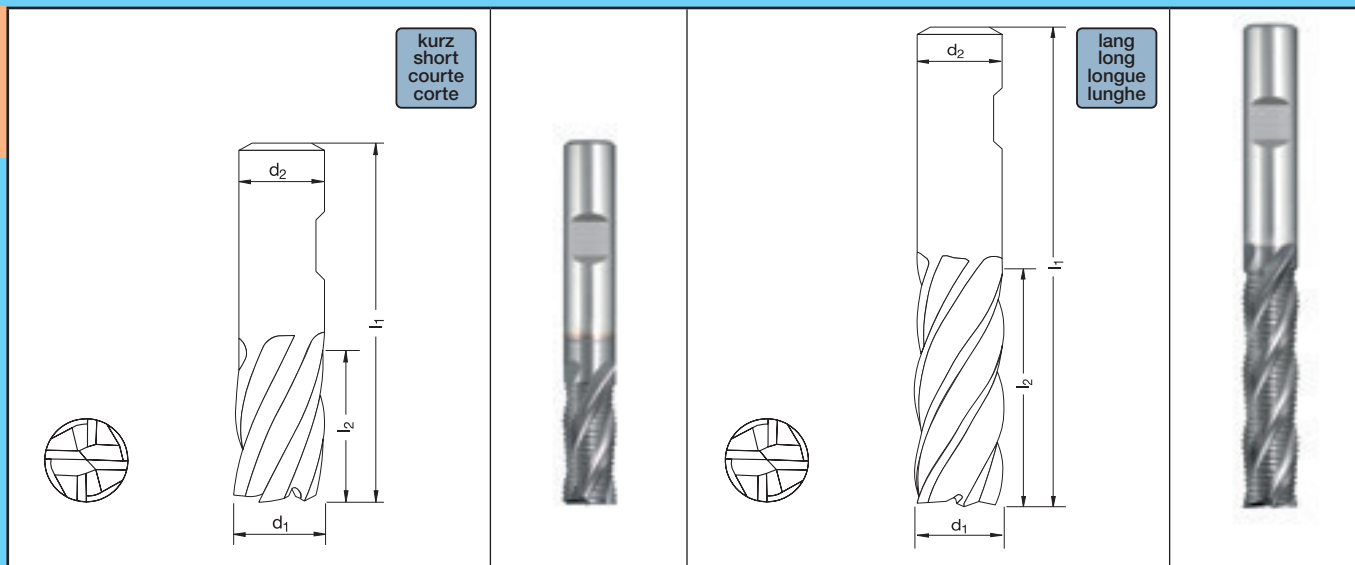
HSSE-
Co8

| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | 444 160 ⁵²⁰ FUTURA | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | 444 180 ⁵²⁰ FUTURA | | | | |
|---|------------------------------|--|------------------------------|----------|--|-----|----|-----|----|---|------------------------------|--|------------------------------|----------|--|--|--|--|--|
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1; 2; 3.1-3.4; 4.1-4.4; 5; 6; 7 | | | | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1; 2; 3.1-3.4; 4.1-4.4; 5; 6; 7 | | | | |
| d₁ [mm] | l₂ [mm] | l₁ [mm] | d₂ [mm] | z | Code | | | | | d₁ [mm] | l₂ [mm] | l₁ [mm] | d₂ [mm] | z | Code | | | | |
| 2 | 7 | 51 | 6 | 4 | 471 096 | 3 | 12 | 56 | 6 | 4 | 471 852 | | | | | | | | |
| 3 | 8 | 52 | 6 | 4 | 471 098 | 4 | 19 | 63 | 6 | 4 | 471 854 | | | | | | | | |
| 4 | 11 | 55 | 6 | 4 | 471 100 | 5 | 24 | 68 | 6 | 4 | 471 856 | | | | | | | | |
| 5 | 13 | 57 | 6 | 4 | 471 102 | 6 | 24 | 68 | 6 | 4 | 471 858 | | | | | | | | |
| 6 | 13 | 57 | 6 | 4 | 471 104 | 7 | 30 | 80 | 10 | 4 | 471 860 | | | | | | | | |
| 7 | 16 | 66 | 10 | 4 | 471 106 | 8 | 38 | 88 | 10 | 4 | 471 862 | | | | | | | | |
| 8 | 19 | 69 | 10 | 4 | 471 108 | 9 | 38 | 88 | 10 | 4 | 471 864 | | | | | | | | |
| 9 | 19 | 69 | 10 | 4 | 471 110 | 10 | 45 | 95 | 10 | 4 | 471 866 | | | | | | | | |
| 10 | 22 | 72 | 10 | 4 | 471 112 | 12 | 53 | 110 | 12 | 4 | 471 868 | | | | | | | | |
| 11 | 22 | 79 | 12 | 4 | 471 113 | 14 | 53 | 110 | 12 | 4 | 471 870 | | | | | | | | |
| 12 | 26 | 83 | 12 | 4 | 471 114 | 16 | 63 | 123 | 16 | 4 | 471 872 | | | | | | | | |
| 13 | 26 | 83 | 12 | 4 | 471 115 | 18 | 63 | 123 | 16 | 4 | 471 874 | | | | | | | | |
| 14 | 26 | 83 | 12 | 4 | 471 116 | 20 | 75 | 141 | 20 | 4 | 471 876 | | | | | | | | |
| 15 | 26 | 83 | 12 | 4 | 471 117 | 22 | 75 | 141 | 20 | 6 | 471 880 | | | | | | | | |
| 16 | 32 | 92 | 16 | 4 | 471 118 | 24 | 90 | 166 | 25 | 6 | 471 882 | | | | | | | | |
| 17 | 32 | 92 | 16 | 4 | 471 119 | 25 | 90 | 166 | 25 | 6 | 471 883 | | | | | | | | |
| 18 | 32 | 92 | 16 | 4 | 471 120 | 30* | 90 | 166 | 25 | 6 | 471 886 | | | | | | | | |
| 20 | 38 | 104 | 20 | 4 | 471 122 | | | | | | | | | | | | | | |
| 21 | 38 | 104 | 20 | 6 | 471 123 | | | | | | | | | | | | | | |
| 22 | 38 | 104 | 20 | 6 | 471 124 | | | | | | | | | | | | | | |
| 25 | 45 | 121 | 25 | 6 | 471 127 | | | | | | | | | | | | | | |
| 28* | 45 | 121 | 25 | 6 | 471 129 | | | | | | | | | | | | | | |
| 30* | 45 | 121 | 25 | 6 | 471 130 | | | | | | | | | | | | | | |

* = > 25,0 mm ohne Stirnschnitt
> 25,0 mm without center cut
> 25,0 mm sans coupe centrale
> 25,0 mm senza taglio al centro

| | | | | | | |
|-------------|-----------|------------|---------------|--------------------------|------------------------|-----------------------------|
| HSSE Co8 | Typ HR | DIN 844 | DIN 1835 B | d ₁ = js14 | d ₂ = h6 | ≤ 1200 N/mm ² |
|-------------|-----------|------------|---------------|--------------------------|------------------------|-----------------------------|

HSSE-
Co8

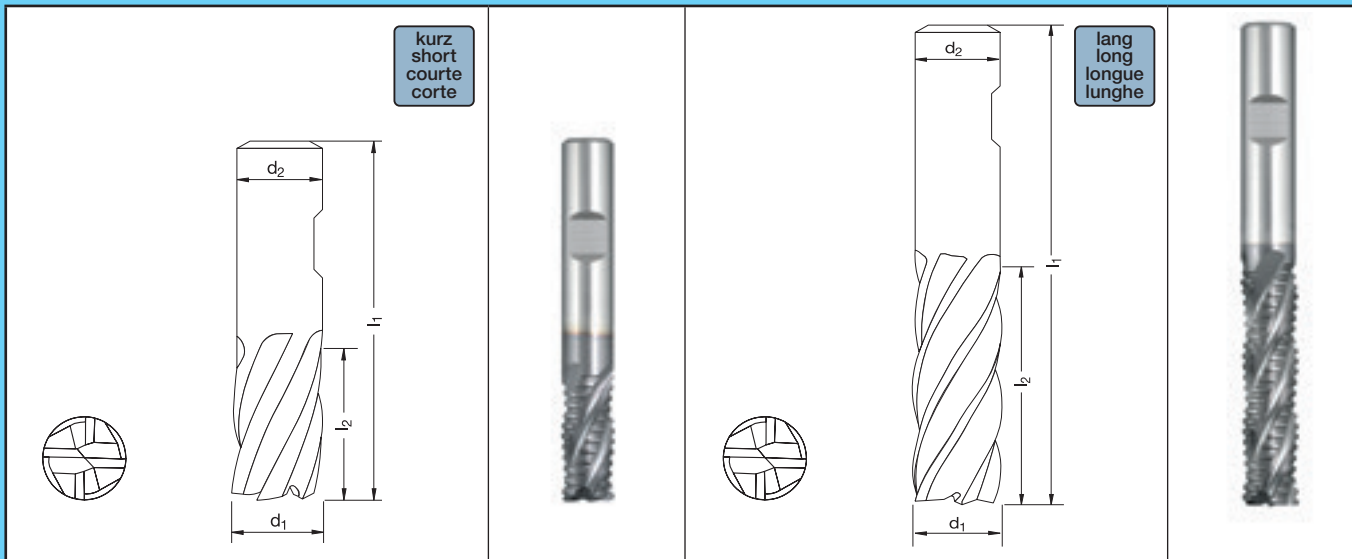
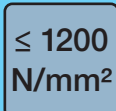
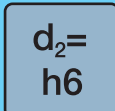
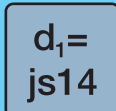
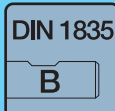


| | | | | | |
|---|--|--|---|--|--|
| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 444 860 ⁵²⁰ FUTURA | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 444 880 ⁵²⁰ FUTURA |
|---|--|--|---|--|--|

| | | | | | |
|---|--|------------------------------------|---|--|------------------------------------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 3.1-3.4; 4.1-4.4; 5; 6; 7 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 3.1-3.4; 4.1-4.4; 5; 6; 7 |
|---|--|------------------------------------|---|--|------------------------------------|

| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | z | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | z | Code |
|------------------------|------------------------|------------------------|------------------------|---|---------|------------------------|------------------------|------------------------|------------------------|---|---------|
| 6 | 13 | 57 | 6 | 4 | 441 030 | 6 | 24 | 68 | 6 | 4 | 442 001 |
| 8 | 19 | 69 | 10 | 4 | 441 032 | 7 | 30 | 80 | 10 | 4 | 442 002 |
| 10 | 22 | 72 | 10 | 4 | 441 034 | 8 | 38 | 88 | 10 | 4 | 442 003 |
| 12 | 26 | 83 | 12 | 4 | 441 036 | 9 | 38 | 88 | 10 | 4 | 442 004 |
| 14 | 26 | 83 | 12 | 4 | 441 038 | 10 | 45 | 95 | 10 | 4 | 442 005 |
| 16 | 32 | 92 | 16 | 4 | 441 040 | 11 | 45 | 102 | 12 | 4 | 442 006 |
| 18 | 32 | 92 | 16 | 4 | 441 042 | 12 | 53 | 110 | 12 | 4 | 442 007 |
| 20 | 38 | 104 | 20 | 4 | 441 044 | 13 | 53 | 110 | 12 | 4 | 442 008 |
| 22 | 38 | 104 | 20 | 5 | 441 045 | 14 | 53 | 110 | 12 | 4 | 442 009 |
| 25 | 45 | 121 | 25 | 5 | 441 047 | 15 | 53 | 110 | 12 | 4 | 442 010 |
| 30* | 45 | 121 | 25 | 5 | 441 050 | 16 | 63 | 123 | 16 | 4 | 442 011 |
| | | | | | | 17 | 63 | 123 | 16 | 4 | 442 012 |
| | | | | | | 18 | 63 | 123 | 16 | 4 | 442 013 |
| | | | | | | 19 | 63 | 123 | 16 | 4 | 442 014 |
| | | | | | | 20 | 75 | 141 | 20 | 4 | 442 015 |
| | | | | | | 22 | 75 | 141 | 20 | 5 | 442 016 |
| | | | | | | 24 | 90 | 166 | 25 | 5 | 442 017 |
| | | | | | | 25 | 90 | 166 | 25 | 5 | 442 018 |
| | | | | | | 26* | 90 | 166 | 25 | 5 | 442 019 |
| | | | | | | 28* | 90 | 166 | 25 | 5 | 442 020 |
| | | | | | | 30* | 90 | 166 | 25 | 5 | 442 021 |

* = > 25,0 mm ohne Stirnschnitt
> 25,0 mm without center cut
> 25,0 mm sans coupe centrale
> 25,0 mm senza taglio al centro



| | | | | | |
|---|--|--|---|--|--|
| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 444 660 ⁵²⁰ FUTURA | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | 444 680 ⁵²⁰ FUTURA |
|---|--|--|---|--|--|

| | | | | | |
|---|--|------------------------------------|---|--|------------------------------------|
| Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 3.1-3.4; 4.1-4.4; 5; 6; 7 | Werkstoffgruppen Groupes de matières | Classification of work materials Gruppo materiali | 1; 2; 3.1-3.4; 4.1-4.4; 5; 6; 7 |
|---|--|------------------------------------|---|--|------------------------------------|

| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | z | Code | d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | z | Code |
|------------------------|------------------------|------------------------|------------------------|---|----------|------------------------|------------------------|------------------------|------------------------|---|----------|
| 6 | 13 | 57 | 6 | 4 | 441 700 | 6 | 24 | 68 | 6 | 4 | 441 737 |
| 7 | 16 | 66 | 10 | 4 | 441 701 | 8 | 38 | 88 | 10 | 4 | 441 738 |
| 8 | 19 | 69 | 10 | 4 | 441 702 | 10 | 45 | 95 | 10 | 4 | 441 740 |
| 9 | 19 | 69 | 10 | 4 | 441 703 | 12 | 53 | 110 | 12 | 4 | 441 741 |
| 10 | 22 | 72 | 10 | 4 | 441 704 | 14 | 53 | 110 | 12 | 4 | 441 742 |
| 12 | 26 | 83 | 12 | 4 | 441 706 | 16 | 63 | 123 | 16 | 4 | 441 744 |
| 14 | 26 | 83 | 12 | 4 | 441 708 | 18 | 63 | 123 | 16 | 4 | 441 745 |
| 16 | 32 | 92 | 16 | 4 | 441 710 | 20 | 75 | 141 | 20 | 4 | 441 746 |
| 20 | 38 | 104 | 20 | 4 | 441 714 | 22 | 75 | 141 | 20 | 5 | 441 747 |
| 22 | 38 | 104 | 20 | 5 | 441 715 | 25 | 90 | 166 | 25 | 5 | 441 749 |
| 25 | 45 | 121 | 25 | 5 | 441 717 | 30 * | 90 | 166 | 25 | 5 | 441 752 |
| 30 * | 45 | 121 | 25 | 5 | 441 720 | | | | | | |

* = > 25,0 mm ohne Stirnschnitt
 > 25,0 mm without center cut
 > 25,0 mm sans coupe centrale
 > 25,0 mm senza taglio al centro



PS 105

Typ
N

DIN
327

kurz
short
courte
corte

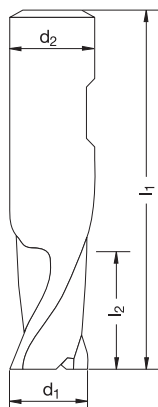
DIN 1835
B

$d_1 =$
e8

$d_2 =$
h6

≤ 45
HRC

PS
105



Katalog-Nr. ^{W%}
Catalogue n° ^{W%}

Catalogue no. ^{W%}
Nr. di catalogo ^{W%}

527 114⁵³⁰

FUTURA

Werkstoffgruppen
Groupes de matières

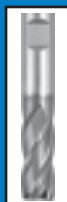
Classification of work materials
Gruppo materiali

1; 2; 5; 6

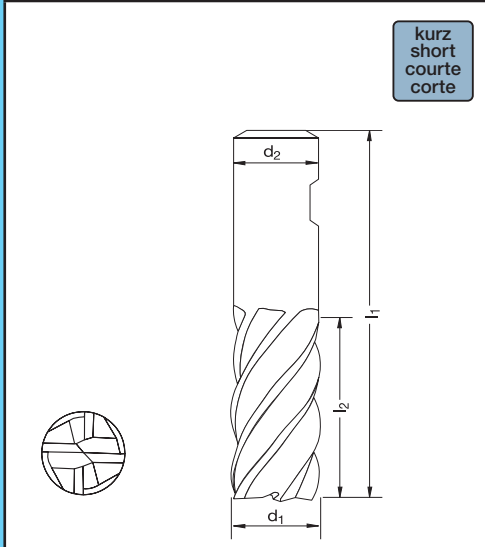
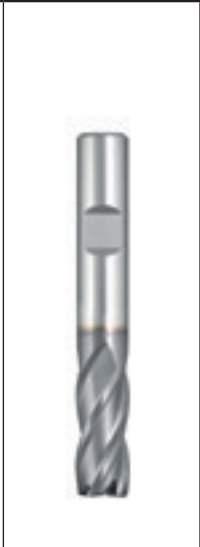
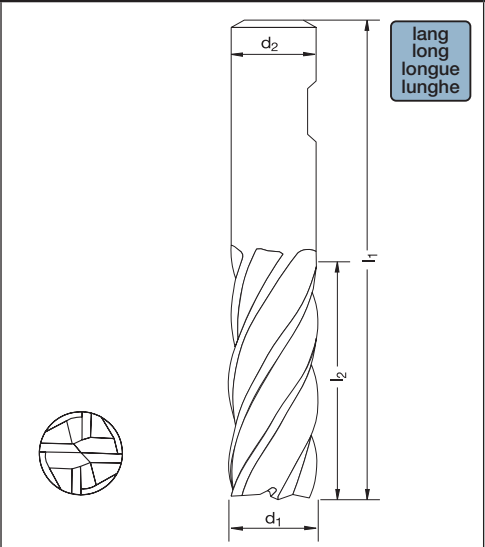

| d_1 [mm] | l_2 [mm] | l_1 [mm] | d_2 [mm] | z | Code |
|---------------|---------------|---------------|---------------|---|------|
|---------------|---------------|---------------|---------------|---|------|

Code

| | | | | | |
|----|----|----|----|---|---------|
| 3 | 5 | 49 | 6 | 2 | 471 754 |
| 4 | 7 | 51 | 6 | 2 | 471 756 |
| 5 | 8 | 52 | 6 | 2 | 471 758 |
| 6 | 8 | 52 | 6 | 2 | 471 760 |
| 8 | 11 | 61 | 10 | 2 | 471 764 |
| 10 | 13 | 63 | 10 | 2 | 471 768 |
| 12 | 16 | 73 | 12 | 2 | 471 770 |
| 14 | 16 | 73 | 12 | 2 | 471 772 |
| 16 | 19 | 79 | 16 | 2 | 471 774 |
| 18 | 19 | 79 | 16 | 2 | 471 776 |
| 20 | 22 | 88 | 20 | 2 | 471 778 |



| | | | | | | |
|--------|-----------------|-------------------|----------------------|----------------------|---------------------|--------------------|
| PS 105 | Typ N | DIN 844 | DIN 1835 B | $d_1=$ k10 | $d_2=$ h6 | ≤ 45 HRC |
|--------|-----------------|-------------------|----------------------|----------------------|---------------------|--------------------|

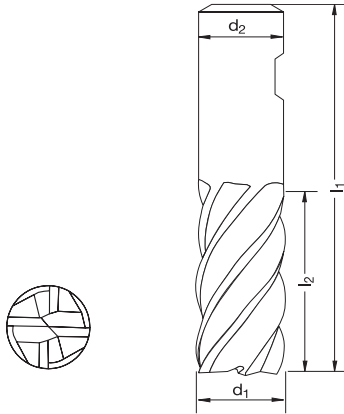
|  | | | | | |  | | | | | |  | | | | | |  | | | | | |
|---|-------|-------|-------|---|--|---|-------|-------|-------|-------|---|---|-------------|-------|-------|-------|-------|---|--|-------------|--|--|--|
| Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} Nr. di catalogo ^{W%} | | | | | | 544 164 ⁵³⁰ FUTURA | | | | | | Katalog-Nr. ^{W%} Catalogue no. ^{W%} Catalogue n° ^{W%} Nr. di catalogo ^{W%} | | | | | | 544 184 ⁵³⁰ FUTURA | | | | | |
| Werkstoffgruppen Groupes de matières Classifikation of work materials Gruppo materiali | | | | | | 1; 2; 5; 6 | | | | | | Werkstoffgruppen Groupes de matières Classifikation of work materials Gruppo materiali | | | | | | 1; 2; 6 | | | | | |
| d_1 | l_2 | l_1 | d_2 | z | | Code | d_1 | l_2 | l_1 | d_2 | z | | Code | d_1 | l_2 | l_1 | d_2 | z | | Code | | | |
| [mm] | [mm] | [mm] | [mm] | | | | [mm] | [mm] | [mm] | [mm] | | | | [mm] | [mm] | [mm] | [mm] | | | | | | |
| 6 | 13 | 57 | 6 | 4 | | 471 816 | 6 | 24 | 68 | 6 | 4 | | 443 063 | | | | | | | | | | |
| 8 | 19 | 69 | 10 | 4 | | 471 820 | 8 | 38 | 88 | 10 | 4 | | 443 065 | | | | | | | | | | |
| 10 | 22 | 72 | 10 | 4 | | 471 824 | 10 | 45 | 95 | 10 | 4 | | 443 067 | | | | | | | | | | |
| 12 | 26 | 83 | 12 | 4 | | 471 826 | 12 | 53 | 110 | 12 | 4 | | 443 069 | | | | | | | | | | |
| 14 | 26 | 83 | 12 | 4 | | 471 828 | 16 | 63 | 123 | 16 | 4 | | 443 073 | | | | | | | | | | |
| 16 | 32 | 92 | 16 | 4 | | 471 830 | 20 | 75 | 141 | 20 | 4 | | 443 076 | | | | | | | | | | |
| 18 | 32 | 92 | 16 | 4 | | 471 832 | | | | | | | | | | | | | | | | | |
| 20 | 38 | 104 | 20 | 4 | | 471 834 | | | | | | | | | | | | | | | | | |
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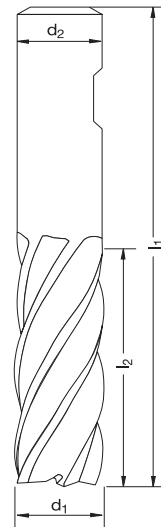
PS 105 Typ HR DIN 844 DIN 1835 B $d_1 = js14$ $d_2 = h6$ ≤ 45 HRC

PS 105

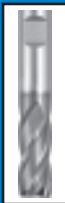
kurz
short
courte
corte



lang
long
longue
lunghe



| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 544 864 ⁵³⁰ FUTURA | | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | 544 884 ⁵³⁰ FUTURA | |
|---|---------------|--|---------------|---|----------|---|---------------|--|---------------|---|----------|
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1; 2; 5; 6 | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | 1; 2; 5; 6 | |
| d_1 [mm] | l_2 [mm] | l_1 [mm] | d_2 [mm] | z | Code | d_1 [mm] | l_2 [mm] | l_1 [mm] | d_2 [mm] | z | Code |
| 6 | 13 | 57 | 6 | 4 | 441 800 | 6 | 24 | 68 | 6 | 4 | 443 093 |
| 7 | 16 | 66 | 10 | 4 | 441 801 | 8 | 38 | 88 | 10 | 4 | 443 095 |
| 8 | 19 | 69 | 10 | 4 | 441 802 | 10 | 45 | 95 | 10 | 4 | 443 097 |
| 9 | 19 | 69 | 10 | 4 | 441 803 | 12 | 53 | 110 | 12 | 4 | 443 099 |
| 10 | 22 | 72 | 10 | 4 | 441 804 | 16 | 63 | 123 | 16 | 4 | 443 103 |
| 11 | 22 | 79 | 10 | 4 | 441 805 | 20 | 75 | 141 | 20 | 4 | 443 107 |
| 12 | 26 | 83 | 12 | 4 | 441 806 | | | | | | |
| 13 | 26 | 83 | 12 | 4 | 441 807 | | | | | | |
| 14 | 26 | 83 | 12 | 4 | 441 808 | | | | | | |
| 15 | 26 | 83 | 12 | 4 | 441 809 | | | | | | |
| 16 | 32 | 92 | 16 | 4 | 441 810 | | | | | | |
| 18 | 32 | 92 | 16 | 4 | 441 812 | | | | | | |
| 20 | 38 | 104 | 20 | 4 | 441 814 | | | | | | |



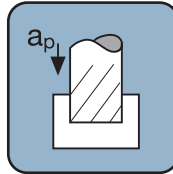
PS 105
DIN 1835
B
d₂=
h6
≤ 45
HRC

| Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | 544 364 ⁵³⁰ FUTURA | | Katalog-Nr. ^{W%} Catalogue n° ^{W%} | | Catalogue no. ^{W%} Nr. di catalogo ^{W%} | | | 544 365 ⁵³⁰ FUTURA | |
|---|------------------------|--|------------------------|---|--|------------------------|---|------------------------|--|------------------------|------------------------|--|----------|
| Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1; 2; 4.1-4.3; 5; 6 | | Werkstoffgruppen Groupes de matières | | Classification of work materials Gruppo materiali | | | 1.6; 5; 6 | |
| d ₁ [mm] | l ₂ [mm] | l ₁ [mm] | d ₂ [mm] | z | Code | d ₁ [mm] | l ₃ [mm] | l ₂ [mm] | d ₃ [mm] | l ₁ [mm] | d ₂ [mm] | z | Code |
| 6 | 13 | 57 | 6 | 3 | 443 004 | 4 | 16 | 5 | 3,7 | 55 | 6 | 4 | 444 104 |
| 8 | 19 | 69 | 10 | 3 | 443 006 | 5 | 18 | 7 | 4,6 | 57 | 6 | 4 | 444 105 |
| 10 | 22 | 72 | 10 | 3 | 443 008 | 6 | 20 | 7 | 5,5 | 57 | 6 | 4 | 444 106 |
| 12 | 26 | 83 | 12 | 3 | 443 010 | 8 | 26 | 9 | 7,4 | 63 | 8 | 4 | 444 108 |
| 16 | 32 | 92 | 16 | 3 | 443 014 | 10 | 31 | 11 | 9,2 | 72 | 10 | 4 | 444 110 |
| 20 | 38 | 104 | 20 | 3 | 443 018 | 12 | 37 | 13 | 11 | 83 | 12 | 4 | 444 112 |
| | | | | | | 16 | 43 | 17 | 15 | 92 | 16 | 4 | 444 116 |
| | | | | | | 20 | 53 | 21 | 19 | 104 | 20 | 4 | 444 120 |
| | | | | | | 25 | 64 | 26 | 24 | 121 | 25 | 4 | 444 125 |

PS 105



527 114



Nutenfräsen
Slotting
Rainurage
Cave

| MAT | 1.1/1.2/1.3/2 | | | | | | HRC <20 |
|---------|----------------|-----|---------------------|---------------------|----------------|----------------------|----------------|
| 320-325 | d ₁ | z | a _p max. | a _e max. | f _z | n | v _f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 9,0 | 0,600 | 0,018 | 3.820 | 280 |
| | 8,0 | 4 | 12,0 | 0,800 | 0,030 | 2.870 | 340 |
| | 10,0 | 4 | 15,0 | 1,000 | 0,045 | 2.300 | 415 |
| | 12,0 | 4 | 18,0 | 1,200 | 0,054 | 1.910 | 415 |
| | 10,0 | 4 | 15,0 | 1,000 | 0,045 | 2.300 | 415 |
| | 12,0 | 4 | 18,0 | 1,200 | 0,054 | 1.910 | 415 |
| | 16,0 | 4 | 24,0 | 1,600 | 0,072 | 1.440 | 415 |
| | 10,0 | 4 | 15,0 | 1,000 | 0,045 | 2.300 | 415 |
| | 12,0 | 4 | 18,0 | 1,200 | 0,054 | 1.910 | 415 |
| | 16,0 | 4 | 24,0 | 1,600 | 0,072 | 1.440 | 415 |
| | 20,0 | 4 | 30,0 | 2,000 | 0,090 | 1.150 | 415 |

| MAT | 1.4/1.5/2 | | | | | | HRC 20-30 |
|---------|----------------|-----|---------------------|---------------------|----------------|----------------------|----------------|
| 320-325 | d ₁ | z | a _p max. | a _e max. | f _z | n | v _f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 3,0 | 2 | 3,0 | - | 0,006 | 5.730 | 75 |
| | 4,0 | 2 | 4,0 | - | 0,011 | 4.300 | 95 |
| | 5,0 | 2 | 5,0 | - | 0,015 | 3.440 | 105 |
| | 6,0 | 2 | 6,0 | - | 0,018 | 2.870 | 105 |
| | 8,0 | 2 | 8,0 | - | 0,030 | 2.150 | 135 |
| | 10,0 | 2 | 10,0 | - | 0,036 | 1.720 | 125 |
| | 12,0 | 2 | 12,0 | - | 0,054 | 1.440 | 160 |
| | 14,0 | 2 | 14,0 | - | 0,063 | 1.230 | 155 |
| | 16,0 | 2 | 16,0 | - | 0,072 | 1.080 | 160 |
| | 18,0 | 2 | 18,0 | - | 0,081 | 960 | 160 |
| | 20,0 | 2 | 20,0 | - | 0,090 | 860 | 155 |

| MAT | 1.4/1.5 | | | | | | HRC 30-38 |
|---------|----------------|-----|---------------------|---------------------|----------------|----------------------|----------------|
| 320-325 | d ₁ | z | a _p max. | a _e max. | f _z | n | v _f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 3,0 | 2 | 2,5 | - | 0,006 | 4.250 | 50 |
| | 4,0 | 2 | 3,0 | - | 0,010 | 3.190 | 65 |
| | 5,0 | 2 | 4,0 | - | 0,013 | 2.550 | 70 |
| | 6,0 | 2 | 4,5 | - | 0,016 | 2.130 | 70 |
| | 8,0 | 2 | 6,0 | - | 0,027 | 1.600 | 90 |
| | 10,0 | 2 | 7,5 | - | 0,032 | 1.280 | 85 |
| | 12,0 | 2 | 9,0 | - | 0,048 | 1.070 | 105 |
| | 14,0 | 2 | 10,5 | - | 0,056 | 910 | 105 |
| | 16,0 | 2 | 12,0 | - | 0,064 | 800 | 105 |
| | 18,0 | 2 | 13,5 | - | 0,072 | 710 | 105 |
| | 20,0 | 2 | 15,0 | - | 0,080 | 640 | 105 |

| MAT | 1.4/1.5 | | | | | | HRC 30-45 |
|---------|----------------|-----|---------------------|---------------------|----------------|----------------------|----------------|
| 320-325 | d ₁ | z | a _p max. | a _e max. | f _z | n | v _f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 3,0 | 2 | 1,5 | - | 0,005 | 2.980 | 30 |
| | 4,0 | 2 | 2,0 | - | 0,008 | 2.230 | 40 |
| | 5,0 | 2 | 2,5 | - | 0,012 | 1.790 | 45 |
| | 6,0 | 2 | 3,0 | - | 0,014 | 1.490 | 45 |
| | 8,0 | 2 | 4,0 | - | 0,024 | 1.120 | 55 |
| | 10,0 | 2 | 5,0 | - | 0,028 | 900 | 55 |
| | 12,0 | 2 | 6,0 | - | 0,042 | 750 | 65 |
| | 14,0 | 2 | 7,0 | - | 0,049 | 640 | 65 |
| | 16,0 | 2 | 8,0 | - | 0,056 | 560 | 65 |
| | 18,0 | 2 | 9,0 | - | 0,063 | 500 | 65 |
| | 20,0 | 2 | 10,0 | - | 0,070 | 450 | 65 |

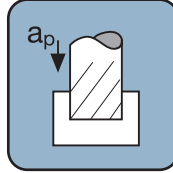
| MAT | 1.6 | | | | | | HRC <25 |
|---------|----------------|-----|---------------------|---------------------|----------------|----------------------|----------------|
| 320-325 | d ₁ | z | a _p max. | a _e max. | f _z | n | v _f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 3,0 | 2 | 1,5 | - | 0,006 | 3.400 | 40 |
| | 4,0 | 2 | 2,0 | - | 0,010 | 2.550 | 50 |
| | 5,0 | 2 | 2,5 | - | 0,013 | 2.040 | 55 |
| | 6,0 | 2 | 3,0 | - | 0,016 | 1.700 | 55 |
| | 8,0 | 2 | 4,0 | - | 0,027 | 1.280 | 70 |
| | 10,0 | 2 | 5,0 | - | 0,032 | 1.020 | 70 |
| | 12,0 | 2 | 6,0 | - | 0,048 | 850 | 85 |
| | 14,0 | 2 | 7,0 | - | 0,056 | 730 | 85 |
| | 16,0 | 2 | 8,0 | - | 0,064 | 640 | 85 |
| | 18,0 | 2 | 9,0 | - | 0,072 | 570 | 85 |
| | 20,0 | 2 | 10,0 | - | 0,080 | 510 | 85 |

| MAT | 5.1/5.2/5.3 | | | | | | HRC <45 |
|---------|----------------|-----|---------------------|---------------------|----------------|----------------------|----------------|
| 320-325 | d ₁ | z | a _p max. | a _e max. | f _z | n | v _f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 3,0 | 2 | 1,2 | - | 0,005 | 1.910 | 20 |
| | 4,0 | 2 | 1,6 | - | 0,009 | 1.440 | 30 |
| | 5,0 | 2 | 2,0 | - | 0,012 | 1.150 | 30 |
| | 6,0 | 2 | 2,4 | - | 0,015 | 960 | 30 |
| | 8,0 | 2 | 3,2 | - | 0,025 | 720 | 40 |
| | 10,0 | 2 | 4,0 | - | 0,030 | 580 | 35 |
| | 12,0 | 2 | 4,8 | - | 0,045 | 480 | 45 |
| | 14,0 | 2 | 5,6 | - | 0,053 | 410 | 45 |
| | 16,0 | 2 | 6,4 | - | 0,060 | 360 | 45 |
| | 18,0 | 2 | 7,2 | - | 0,068 | 320 | 45 |
| | 20,0 | 2 | 8,0 | - | 0,075 | 290 | 45 |

527 114



FUTURA



Nutenfräsen
Slotting
Rainurage
Cave

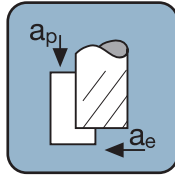
| MAT 320-325 | 6.1/6.2/6.3 | | | | | HRC <45 | |
|----------------|---------------|------------|-----------------------|-----------------------|---------------|------------|-----------------------------|
| | d_1 [mm] | z [-] | a_p max. [mm] | a_e max. [mm] | f_z [mm] | | n [min ⁻¹] |
| | 3,0 | 2 | 0,8 | - | 0,004 | 1.490 | 15 |
| | 4,0 | 2 | 1,0 | - | 0,007 | 1.120 | 20 |
| | 5,0 | 2 | 1,3 | - | 0,010 | 900 | 20 |
| | 6,0 | 2 | 1,5 | - | 0,012 | 750 | 20 |
| | 8,0 | 2 | 2,0 | - | 0,020 | 560 | 25 |
| | 10,0 | 2 | 2,5 | - | 0,024 | 450 | 25 |
| | 12,0 | 2 | 3,0 | - | 0,036 | 380 | 30 |
| | 14,0 | 2 | 3,5 | - | 0,042 | 320 | 30 |
| | 16,0 | 2 | 4,0 | - | 0,048 | 280 | 30 |
| | 18,0 | 2 | 4,5 | - | 0,054 | 250 | 30 |
| | 20,0 | 2 | 5,0 | - | 0,060 | 230 | 30 |



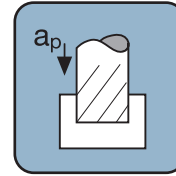
544 164



FUTURA



Seitenfräsen
Sidemilling
Contournage
Contornatura



Nutenfräsen
Slotting
Rainurage
Cave

| MAT | 1.1/1.2/1.3/2 | | | | | | HRC <20 |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 9,0 | 0,600 | 0,018 | 3.820 | 280 |
| | 8,0 | 4 | 12,0 | 0,800 | 0,030 | 2.870 | 340 |
| | 10,0 | 4 | 15,0 | 1,000 | 0,045 | 2.300 | 415 |
| | 12,0 | 4 | 18,0 | 1,200 | 0,054 | 1.910 | 415 |
| | 16,0 | 4 | 24,0 | 1,600 | 0,072 | 1.440 | 415 |
| | 20,0 | 4 | 30,0 | 2,000 | 0,090 | 1.150 | 415 |

| MAT | 1.1/1.2/1.3/2 | | | | | | HRC <20 |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 1,8 | - | 0,014 | 3.400 | 200 |
| | 8,0 | 4 | 2,4 | - | 0,024 | 2.550 | 245 |
| | 10,0 | 4 | 3,0 | - | 0,036 | 2.040 | 295 |
| | 12,0 | 4 | 3,6 | - | 0,043 | 1.700 | 295 |
| | 16,0 | 4 | 4,8 | - | 0,058 | 1.280 | 295 |
| | 20,0 | 4 | 6,0 | - | 0,072 | 1.020 | 295 |

| MAT | 1.4/1.5/2 | | | | | | HRC 20-30 |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 9,0 | 0,600 | 0,016 | 3.190 | 210 |
| | 8,0 | 4 | 12,0 | 0,800 | 0,027 | 2.390 | 255 |
| | 10,0 | 4 | 15,0 | 1,000 | 0,041 | 1.910 | 310 |
| | 12,0 | 4 | 18,0 | 1,200 | 0,049 | 1.600 | 315 |
| | 16,0 | 4 | 24,0 | 1,600 | 0,065 | 1.200 | 315 |
| | 20,0 | 4 | 30,0 | 2,000 | 0,081 | 960 | 315 |

| MAT | 1.4/1.5/2 | | | | | | HRC 20-30 |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 1,8 | - | 0,013 | 2.870 | 150 |
| | 8,0 | 4 | 2,4 | - | 0,021 | 2.150 | 185 |
| | 10,0 | 4 | 3,0 | - | 0,032 | 1.720 | 225 |
| | 12,0 | 4 | 3,6 | - | 0,039 | 1.440 | 225 |
| | 16,0 | 4 | 4,8 | - | 0,052 | 1.080 | 225 |
| | 20,0 | 4 | 6,0 | - | 0,065 | 860 | 225 |

| MAT | 1.4/1.5 | | | | | | HRC 30-38 |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 9,0 | 0,600 | 0,014 | 2.550 | 150 |
| | 8,0 | 4 | 12,0 | 0,800 | 0,024 | 1.910 | 185 |
| | 10,0 | 4 | 15,0 | 1,000 | 0,036 | 1.530 | 225 |
| | 12,0 | 4 | 18,0 | 1,200 | 0,043 | 1.280 | 225 |
| | 16,0 | 4 | 24,0 | 1,600 | 0,058 | 960 | 225 |
| | 20,0 | 4 | 30,0 | 2,000 | 0,072 | 770 | 225 |

| MAT | 1.4/1.5 | | | | | | HRC 30-38 |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 1,8 | - | 0,012 | 2.290 | 110 |
| | 8,0 | 4 | 2,4 | - | 0,019 | 1.720 | 135 |
| | 10,0 | 4 | 3,0 | - | 0,029 | 1.370 | 160 |
| | 12,0 | 4 | 3,6 | - | 0,035 | 1.150 | 160 |
| | 16,0 | 4 | 4,8 | - | 0,046 | 860 | 160 |
| | 20,0 | 4 | 6,0 | - | 0,058 | 690 | 160 |

| MAT | 1.4/1.5 | | | | | | HRC 30-45 |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 6,0 | 0,600 | 0,013 | 1.700 | 90 |
| | 8,0 | 4 | 8,0 | 0,800 | 0,021 | 1.280 | 110 |
| | 10,0 | 4 | 10,0 | 1,000 | 0,032 | 1.020 | 130 |
| | 12,0 | 4 | 12,0 | 1,200 | 0,038 | 850 | 130 |
| | 16,0 | 4 | 16,0 | 1,600 | 0,050 | 640 | 130 |
| | 20,0 | 4 | 20,0 | 2,000 | 0,063 | 510 | 130 |

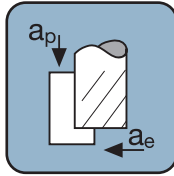
| MAT | 1.4/1.5 | | | | | | HRC 30-45 |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 1,5 | - | 0,010 | 1.540 | 65 |
| | 8,0 | 4 | 2,0 | - | 0,017 | 1.160 | 80 |
| | 10,0 | 4 | 2,5 | - | 0,025 | 930 | 95 |
| | 12,0 | 4 | 3,0 | - | 0,030 | 770 | 95 |
| | 16,0 | 4 | 4,0 | - | 0,040 | 580 | 95 |
| | 20,0 | 4 | 5,0 | - | 0,050 | 470 | 95 |



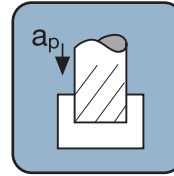
544 164



FUTURA



Seitenfräsen
Sidemilling
Contournage
Contornatura



Nutenfräsen
Slotting
Rainurage
Cave

| MAT | 1.6 | | | | | | HRC <25 |
|---------|-------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 6,0 | 0,600 | 0,014 | 1.910 | 115 |
| | 8,0 | 4 | 8,0 | 0,800 | 0,024 | 1.440 | 140 |
| | 10,0 | 4 | 10,0 | 1,000 | 0,036 | 1.150 | 170 |
| | 12,0 | 4 | 12,0 | 1,200 | 0,043 | 960 | 170 |
| | 16,0 | 4 | 16,0 | 1,600 | 0,058 | 720 | 170 |
| | 20,0 | 4 | 20,0 | 2,000 | 0,072 | 580 | 170 |

| MAT | 1.6 | | | | | | HRC <25 |
|---------|-------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 1,5 | - | 0,012 | 1.700 | 80 |
| | 8,0 | 4 | 2,0 | - | 0,019 | 1.280 | 100 |
| | 10,0 | 4 | 2,5 | - | 0,029 | 1.020 | 120 |
| | 12,0 | 4 | 3,0 | - | 0,035 | 850 | 120 |
| | 16,0 | 4 | 4,0 | - | 0,046 | 640 | 120 |
| | 20,0 | 4 | 5,0 | - | 0,058 | 510 | 120 |

| MAT | 5.1/5.2/5.3 | | | | | | HRC <45 |
|---------|-------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 6,0 | 0,600 | 0,014 | 1.280 | 70 |
| | 8,0 | 4 | 8,0 | 0,800 | 0,022 | 960 | 90 |
| | 10,0 | 4 | 10,0 | 1,000 | 0,034 | 770 | 105 |
| | 12,0 | 4 | 12,0 | 1,200 | 0,041 | 640 | 105 |
| | 16,0 | 4 | 16,0 | 1,600 | 0,054 | 480 | 105 |
| | 20,0 | 4 | 20,0 | 2,000 | 0,068 | 390 | 110 |

| MAT | 5.1/5.2/5.3 | | | | | | HRC <45 |
|---------|-------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 1,5 | - | 0,011 | 1.170 | 55 |
| | 8,0 | 4 | 2,0 | - | 0,018 | 880 | 65 |
| | 10,0 | 4 | 2,5 | - | 0,027 | 710 | 80 |
| | 12,0 | 4 | 3,0 | - | 0,032 | 590 | 80 |
| | 16,0 | 4 | 4,0 | - | 0,043 | 440 | 80 |
| | 20,0 | 4 | 5,0 | - | 0,054 | 360 | 80 |

| MAT | 6.1/6.2/6.3 | | | | | | HRC <45 |
|---------|-------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 6,0 | 0,600 | 0,011 | 850 | 40 |
| | 8,0 | 4 | 8,0 | 0,800 | 0,018 | 640 | 50 |
| | 10,0 | 4 | 10,0 | 1,000 | 0,027 | 510 | 60 |
| | 12,0 | 4 | 12,0 | 1,200 | 0,032 | 430 | 60 |
| | 16,0 | 4 | 16,0 | 1,600 | 0,043 | 320 | 60 |
| | 20,0 | 4 | 20,0 | 2,000 | 0,054 | 260 | 60 |

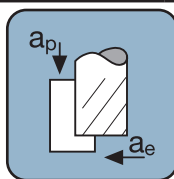
| MAT | 6.1/6.2/6.3 | | | | | | HRC <45 |
|---------|-------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 1,2 | - | 0,009 | 750 | 30 |
| | 8,0 | 4 | 1,6 | - | 0,014 | 560 | 35 |
| | 10,0 | 4 | 2,0 | - | 0,022 | 450 | 40 |
| | 12,0 | 4 | 2,4 | - | 0,026 | 380 | 40 |
| | 16,0 | 4 | 3,2 | - | 0,035 | 280 | 40 |
| | 20,0 | 4 | 4,0 | - | 0,043 | 230 | 40 |



544 184



FUTURA



Seitenfräsen
Sidemilling
Contournage
Contornatura

| MAT | 1.1/1.2/1.3/2 | | | | | | HRC <20 |
|---------|---------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 12,0 | 0,300 | 0,013 | 2.550 | 130 |
| | 8,0 | 4 | 16,0 | 0,400 | 0,021 | 1.910 | 160 |
| | 10,0 | 4 | 20,0 | 0,500 | 0,032 | 1.530 | 195 |
| | 12,0 | 4 | 24,0 | 0,600 | 0,038 | 1.280 | 195 |
| | 16,0 | 4 | 32,0 | 0,800 | 0,050 | 960 | 195 |
| | 20,0 | 4 | 40,0 | 1,000 | 0,063 | 770 | 195 |

| MAT | 1.4/1.5/2 | | | | | | HRC 20-30 |
|---------|-----------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 12,0 | 0,300 | 0,011 | 2.130 | 100 |
| | 8,0 | 4 | 16,0 | 0,400 | 0,019 | 1.600 | 120 |
| | 10,0 | 4 | 20,0 | 0,500 | 0,028 | 1.280 | 150 |
| | 12,0 | 4 | 24,0 | 0,600 | 0,034 | 1.070 | 150 |
| | 16,0 | 4 | 32,0 | 0,800 | 0,045 | 800 | 150 |
| | 20,0 | 4 | 40,0 | 1,000 | 0,057 | 640 | 150 |

| MAT | 1.4/1.5 | | | | | | HRC 30-38 |
|---------|---------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 12,0 | 0,300 | 0,010 | 1.700 | 70 |
| | 8,0 | 4 | 16,0 | 0,400 | 0,017 | 1.280 | 85 |
| | 10,0 | 4 | 20,0 | 0,500 | 0,025 | 1.020 | 105 |
| | 12,0 | 4 | 24,0 | 0,600 | 0,030 | 850 | 105 |
| | 16,0 | 4 | 32,0 | 0,800 | 0,040 | 640 | 105 |
| | 20,0 | 4 | 40,0 | 1,000 | 0,050 | 510 | 105 |

| MAT | 1.4/1.5 | | | | | | HRC 30-45 |
|---------|---------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 9,0 | 0,300 | 0,009 | 1.120 | 40 |
| | 8,0 | 4 | 12,0 | 0,400 | 0,015 | 840 | 50 |
| | 10,0 | 4 | 15,0 | 0,500 | 0,022 | 670 | 60 |
| | 12,0 | 4 | 18,0 | 0,600 | 0,026 | 560 | 60 |
| | 16,0 | 4 | 24,0 | 0,800 | 0,035 | 420 | 60 |
| | 20,0 | 4 | 30,0 | 1,000 | 0,044 | 340 | 60 |

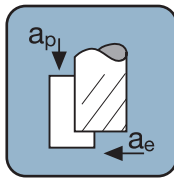
| MAT | 1.6 | | | | | | HRC <25 |
|---------|-------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 9,0 | 0,300 | 0,010 | 1.280 | 55 |
| | 8,0 | 4 | 12,0 | 0,400 | 0,017 | 960 | 65 |
| | 10,0 | 4 | 15,0 | 0,500 | 0,025 | 770 | 80 |
| | 12,0 | 4 | 18,0 | 0,600 | 0,030 | 640 | 80 |
| | 16,0 | 4 | 24,0 | 0,800 | 0,040 | 480 | 80 |
| | 20,0 | 4 | 30,0 | 1,000 | 0,050 | 390 | 80 |

| MAT | 1.6 | | | | | | HRC <45 |
|---------|-------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 9,0 | 0,300 | 0,009 | 850 | 35 |
| | 8,0 | 4 | 12,0 | 0,400 | 0,016 | 640 | 40 |
| | 10,0 | 4 | 15,0 | 0,500 | 0,024 | 510 | 50 |
| | 12,0 | 4 | 18,0 | 0,600 | 0,028 | 430 | 50 |
| | 16,0 | 4 | 24,0 | 0,800 | 0,038 | 320 | 50 |
| | 20,0 | 4 | 30,0 | 1,000 | 0,047 | 260 | 50 |

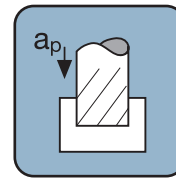
| MAT | 6.1/6.2/6.3 | | | | | | HRC <45 |
|---------|-------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 6,0 | 0,300 | 0,008 | 590 | 20 |
| | 8,0 | 4 | 8,0 | 0,400 | 0,012 | 440 | 25 |
| | 10,0 | 4 | 10,0 | 0,500 | 0,019 | 360 | 30 |
| | 12,0 | 4 | 12,0 | 0,600 | 0,023 | 300 | 30 |
| | 16,0 | 4 | 16,0 | 0,800 | 0,030 | 220 | 30 |
| | 20,0 | 4 | 20,0 | 1,000 | 0,038 | 180 | 30 |



544 864



Seitenfräsen
Side milling
Contournage
Contornatura



Nutenfräsen
Slotting
Rainurage
Cave

| MAT | 1.1/1.2/1.3/2 | | | | | | HRC <20 |
|---------|---------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 9,0 | 3,0 | 0,025 | 3.980 | 405 |
| | 8,0 | 4 | 12,0 | 4,0 | 0,035 | 2.990 | 425 |
| | 10,0 | 4 | 15,0 | 5,0 | 0,050 | 2.390 | 480 |
| | 12,0 | 4 | 18,0 | 6,0 | 0,066 | 1.990 | 530 |
| | 16,0 | 4 | 24,0 | 8,0 | 0,088 | 1.500 | 530 |
| | 20,0 | 4 | 30,0 | 10,0 | 0,110 | 1.200 | 530 |

| MAT | 1.1/1.2/1.3/2 | | | | | | HRC <20 |
|---------|---------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 6,0 | - | 0,020 | 3.560 | 290 |
| | 8,0 | 4 | 8,0 | - | 0,028 | 2.670 | 305 |
| | 10,0 | 4 | 10,0 | - | 0,040 | 2.140 | 345 |
| | 12,0 | 4 | 12,0 | - | 0,053 | 1.780 | 380 |
| | 16,0 | 4 | 16,0 | - | 0,070 | 1.340 | 380 |
| | 20,0 | 4 | 20,0 | - | 0,088 | 1.070 | 380 |

| MAT | 1.4/1.5/2 | | | | | | HRC 20-30 |
|---------|-----------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 9,0 | 2,4 | 0,023 | 3.350 | 305 |
| | 8,0 | 4 | 12,0 | 3,2 | 0,032 | 2.510 | 320 |
| | 10,0 | 4 | 15,0 | 4,0 | 0,045 | 2.010 | 365 |
| | 12,0 | 4 | 18,0 | 4,8 | 0,059 | 1.680 | 400 |
| | 16,0 | 4 | 24,0 | 6,4 | 0,079 | 1.260 | 400 |
| | 20,0 | 4 | 30,0 | 8,0 | 0,099 | 1.010 | 400 |

| MAT | 1.4/1.5/2 | | | | | | HRC 20-30 |
|---------|-----------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 6,0 | - | 0,018 | 3.030 | 220 |
| | 8,0 | 4 | 8,0 | - | 0,025 | 2.270 | 235 |
| | 10,0 | 4 | 10,0 | - | 0,036 | 1.820 | 265 |
| | 12,0 | 4 | 12,0 | - | 0,048 | 1.520 | 290 |
| | 16,0 | 4 | 16,0 | - | 0,063 | 1.140 | 290 |
| | 20,0 | 4 | 20,0 | - | 0,079 | 910 | 290 |

| MAT | 1.4/1.5 | | | | | | HRC 30-38 |
|---------|---------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 9,0 | 2,4 | 0,020 | 2.550 | 210 |
| | 8,0 | 4 | 12,0 | 3,2 | 0,028 | 1.910 | 220 |
| | 10,0 | 4 | 15,0 | 4,0 | 0,040 | 1.530 | 245 |
| | 12,0 | 4 | 18,0 | 4,8 | 0,053 | 1.280 | 275 |
| | 16,0 | 4 | 24,0 | 6,4 | 0,070 | 960 | 275 |
| | 20,0 | 4 | 30,0 | 8,0 | 0,088 | 770 | 275 |

| MAT | 1.4/1.5 | | | | | | HRC 30-38 |
|---------|---------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 6,0 | - | 0,016 | 2.290 | 150 |
| | 8,0 | 4 | 8,0 | - | 0,023 | 1.720 | 155 |
| | 10,0 | 4 | 10,0 | - | 0,032 | 1.370 | 180 |
| | 12,0 | 4 | 12,0 | - | 0,042 | 1.150 | 195 |
| | 16,0 | 4 | 16,0 | - | 0,056 | 860 | 195 |
| | 20,0 | 4 | 20,0 | - | 0,070 | 690 | 195 |

| MAT | 1.4/1.5 | | | | | | HRC 30-45 |
|---------|---------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 6,0 | 2,0 | 0,018 | 1.700 | 120 |
| | 8,0 | 4 | 8,0 | 2,7 | 0,025 | 1.280 | 130 |
| | 10,0 | 4 | 10,0 | 3,3 | 0,035 | 1.020 | 145 |
| | 12,0 | 4 | 12,0 | 4,0 | 0,046 | 850 | 160 |
| | 16,0 | 4 | 16,0 | 5,3 | 0,062 | 640 | 160 |
| | 20,0 | 4 | 20,0 | 6,6 | 0,077 | 510 | 160 |

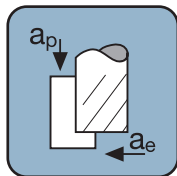
| MAT | 1.4/1.5 | | | | | | HRC 30-45 |
|---------|---------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 4,5 | - | 0,014 | 1.540 | 90 |
| | 8,0 | 4 | 6,0 | - | 0,020 | 1.160 | 95 |
| | 10,0 | 4 | 7,5 | - | 0,028 | 930 | 105 |
| | 12,0 | 4 | 9,0 | - | 0,037 | 770 | 115 |
| | 16,0 | 4 | 12,0 | - | 0,049 | 580 | 115 |
| | 20,0 | 4 | 15,0 | - | 0,062 | 470 | 120 |



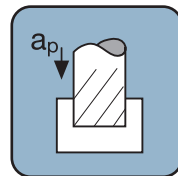
544 864



FUTURA



Seitenfräsen
Side milling
Contournage
Contornatura



Nutenfräsen
Slotting
Rainurage
Cave

| MAT | 1.6 | | | | | | HRC <25 |
|---------|-------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 6,0 | 2,4 | 0,020 | 1.910 | 155 |
| | 8,0 | 4 | 8,0 | 3,2 | 0,028 | 1.440 | 165 |
| | 10,0 | 4 | 10,0 | 4,0 | 0,040 | 1.150 | 185 |
| | 12,0 | 4 | 12,0 | 4,8 | 0,053 | 960 | 205 |
| | 16,0 | 4 | 16,0 | 6,4 | 0,070 | 720 | 205 |
| | 20,0 | 4 | 20,0 | 8,0 | 0,088 | 580 | 205 |

| MAT | 1.6 | | | | | | HRC <25 |
|---------|-------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 3,6 | - | 0,016 | 1.700 | 110 |
| | 8,0 | 4 | 4,8 | - | 0,023 | 1.280 | 120 |
| | 10,0 | 4 | 6,0 | - | 0,032 | 1.020 | 135 |
| | 12,0 | 4 | 7,2 | - | 0,042 | 850 | 145 |
| | 16,0 | 4 | 9,6 | - | 0,056 | 640 | 145 |
| | 20,0 | 4 | 12,0 | - | 0,070 | 510 | 145 |

| MAT | 5.1/5.2/5.3 | | | | | | HRC <45 |
|---------|-------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 6,0 | 2,0 | 0,019 | 1.280 | 100 |
| | 8,0 | 4 | 8,0 | 2,7 | 0,026 | 960 | 105 |
| | 10,0 | 4 | 10,0 | 3,3 | 0,038 | 770 | 120 |
| | 12,0 | 4 | 12,0 | 4,0 | 0,050 | 640 | 130 |
| | 16,0 | 4 | 16,0 | 5,3 | 0,066 | 480 | 130 |
| | 20,0 | 4 | 20,0 | 6,6 | 0,083 | 390 | 130 |

| MAT | 5.1/5.2/5.3 | | | | | | HRC <45 |
|---------|-------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 3,0 | - | 0,015 | 1.170 | 75 |
| | 8,0 | 4 | 4,0 | - | 0,021 | 880 | 75 |
| | 10,0 | 4 | 5,0 | - | 0,030 | 710 | 90 |
| | 12,0 | 4 | 6,0 | - | 0,040 | 590 | 95 |
| | 16,0 | 4 | 8,0 | - | 0,053 | 440 | 95 |
| | 20,0 | 4 | 10,0 | - | 0,066 | 360 | 100 |

| MAT | 6.1/6.2/6.3 | | | | | | HRC <45 |
|---------|-------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 6,0 | 1,5 | 0,015 | 850 | 55 |
| | 8,0 | 4 | 8,0 | 2,0 | 0,021 | 640 | 55 |
| | 10,0 | 4 | 10,0 | 2,5 | 0,030 | 510 | 65 |
| | 12,0 | 4 | 12,0 | 3,0 | 0,040 | 430 | 70 |
| | 16,0 | 4 | 16,0 | 4,0 | 0,053 | 320 | 70 |
| | 20,0 | 4 | 20,0 | 5,0 | 0,066 | 260 | 70 |

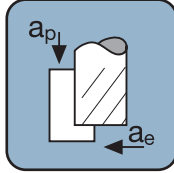
| MAT | 6.1/6.2/6.3 | | | | | | HRC <45 |
|---------|-------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 2,4 | - | 0,012 | 750 | 40 |
| | 8,0 | 4 | 3,2 | - | 0,017 | 560 | 40 |
| | 10,0 | 4 | 4,0 | - | 0,024 | 450 | 45 |
| | 12,0 | 4 | 4,8 | - | 0,032 | 380 | 50 |
| | 16,0 | 4 | 6,4 | - | 0,042 | 280 | 50 |
| | 20,0 | 4 | 8,0 | - | 0,053 | 230 | 50 |



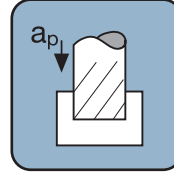
544 884



FUTURA



Seitenfräsen
Sidemilling
Contournage
Contornatura



Nutenfräsen
Slotting
Rainurage
Cave

| MAT | 1.1/1.2/1.3/2 | | | | | | HRC <20 |
|---------|---------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 12,0 | 1,800 | 0,018 | 2.660 | 190 |
| | 8,0 | 4 | 16,0 | 2,400 | 0,025 | 1.990 | 200 |
| | 10,0 | 4 | 20,0 | 3,000 | 0,035 | 1.600 | 225 |
| | 12,0 | 4 | 24,0 | 3,600 | 0,046 | 1.330 | 250 |
| | 16,0 | 4 | 32,0 | 4,800 | 0,062 | 1.000 | 250 |
| | 20,0 | 4 | 40,0 | 6,000 | 0,077 | 800 | 250 |

| MAT | 1.1/1.2/1.3/2 | | | | | | HRC <20 |
|---------|---------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 3,0 | - | 0,014 | 2.390 | 135 |
| | 8,0 | 4 | 4,0 | - | 0,020 | 1.800 | 145 |
| | 10,0 | 4 | 5,0 | - | 0,028 | 1.440 | 165 |
| | 12,0 | 4 | 6,0 | - | 0,037 | 1.200 | 180 |
| | 16,0 | 4 | 8,0 | - | 0,049 | 900 | 180 |
| | 20,0 | 4 | 10,0 | - | 0,062 | 720 | 180 |

| MAT | 1.4/1.5/2 | | | | | | HRC 20-30 |
|---------|-----------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 12,0 | 1,800 | 0,016 | 2.230 | 145 |
| | 8,0 | 4 | 16,0 | 2,400 | 0,022 | 1.680 | 150 |
| | 10,0 | 4 | 20,0 | 3,000 | 0,032 | 1.340 | 170 |
| | 12,0 | 4 | 24,0 | 3,600 | 0,042 | 1.120 | 190 |
| | 16,0 | 4 | 32,0 | 4,800 | 0,055 | 840 | 190 |
| | 20,0 | 4 | 40,0 | 6,000 | 0,069 | 670 | 190 |

| MAT | 1.4/1.5/2 | | | | | | HRC 20-30 |
|---------|-----------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 3,0 | - | 0,013 | 2.020 | 105 |
| | 8,0 | 4 | 4,0 | - | 0,018 | 1.520 | 110 |
| | 10,0 | 4 | 5,0 | - | 0,025 | 1.210 | 125 |
| | 12,0 | 4 | 6,0 | - | 0,033 | 1.010 | 135 |
| | 16,0 | 4 | 8,0 | - | 0,044 | 760 | 135 |
| | 20,0 | 4 | 10,0 | - | 0,055 | 610 | 140 |

| MAT | 1.4/1.5 | | | | | | HRC 30-38 |
|---------|---------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 12,0 | 1,800 | 0,014 | 1.700 | 100 |
| | 8,0 | 4 | 16,0 | 2,400 | 0,020 | 1.280 | 105 |
| | 10,0 | 4 | 20,0 | 3,000 | 0,028 | 1.020 | 115 |
| | 12,0 | 4 | 24,0 | 3,600 | 0,037 | 850 | 130 |
| | 16,0 | 4 | 32,0 | 4,800 | 0,049 | 640 | 130 |
| | 20,0 | 4 | 40,0 | 6,000 | 0,062 | 510 | 130 |

| MAT | 1.4/1.5 | | | | | | HRC 30-38 |
|---------|---------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 3,0 | - | 0,011 | 1.490 | 70 |
| | 8,0 | 4 | 4,0 | - | 0,016 | 1.120 | 75 |
| | 10,0 | 4 | 5,0 | - | 0,022 | 900 | 85 |
| | 12,0 | 4 | 6,0 | - | 0,030 | 750 | 90 |
| | 16,0 | 4 | 8,0 | - | 0,039 | 560 | 90 |
| | 20,0 | 4 | 10,0 | - | 0,049 | 450 | 90 |

| MAT | 1.4/1.5 | | | | | | HRC 30-45 |
|---------|---------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 9,0 | 1,500 | 0,012 | 1.120 | 60 |
| | 8,0 | 4 | 12,0 | 2,000 | 0,017 | 840 | 60 |
| | 10,0 | 4 | 15,0 | 2,500 | 0,025 | 670 | 70 |
| | 12,0 | 4 | 18,0 | 3,000 | 0,032 | 560 | 75 |
| | 16,0 | 4 | 24,0 | 4,000 | 0,043 | 420 | 75 |
| | 20,0 | 4 | 30,0 | 5,000 | 0,054 | 340 | 75 |

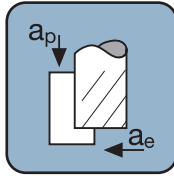
| MAT | 1.4/1.5 | | | | | | HRC 30-45 |
|---------|---------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 4 | 2,4 | - | 0,010 | 1.010 | 40 |
| | 8,0 | 4 | 3,2 | - | 0,014 | 760 | 45 |
| | 10,0 | 4 | 4,0 | - | 0,020 | 610 | 50 |
| | 12,0 | 4 | 4,8 | - | 0,026 | 510 | 55 |
| | 16,0 | 4 | 6,4 | - | 0,034 | 380 | 55 |
| | 20,0 | 4 | 8,0 | - | 0,043 | 310 | 55 |



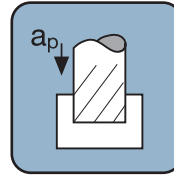
544 884



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| MAT | 1.6 | | | | | | HRC |
|----------------|-----|------------------------|------------------------|----------------|----------------------|----------------|-----|
| 320-325 | | | | | | | <25 |
| d ₁ | z | a _p max. | a _e max. | f _z | n | v _f | |
| [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] | |
| 6,0 | 4 | 9,0 | 1,500 | 0,014 | 1.280 | 75 | |
| 8,0 | 4 | 12,0 | 2,000 | 0,020 | 960 | 80 | |
| 10,0 | 4 | 15,0 | 2,500 | 0,028 | 770 | 90 | |
| 12,0 | 4 | 18,0 | 3,000 | 0,037 | 640 | 95 | |
| 16,0 | 4 | 24,0 | 4,000 | 0,049 | 480 | 95 | |
| 20,0 | 4 | 30,0 | 5,000 | 0,062 | 390 | 100 | |

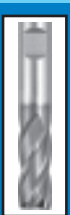
| MAT | 1.6 | | | | | | HRC |
|----------------|-----|------------------------|------------------------|----------------|----------------------|----------------|-----|
| 320-325 | | | | | | | <25 |
| d ₁ | z | a _p max. | a _e max. | f _z | n | v _f | |
| [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] | |
| 6,0 | 4 | 2,4 | - | 0,011 | 1.170 | 55 | |
| 8,0 | 4 | 3,2 | - | 0,016 | 880 | 60 | |
| 10,0 | 4 | 4,0 | - | 0,022 | 710 | 65 | |
| 12,0 | 4 | 4,8 | - | 0,030 | 590 | 70 | |
| 16,0 | 4 | 6,4 | - | 0,039 | 440 | 70 | |
| 20,0 | 4 | 8,0 | - | 0,049 | 360 | 75 | |

| MAT | 5.1/5.2/5.3 | | | | | | HRC |
|----------------|-------------|------------------------|------------------------|----------------|----------------------|----------------|-----|
| 320-325 | | | | | | | <45 |
| d ₁ | z | a _p max. | a _e max. | f _z | n | v _f | |
| [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] | |
| 6,0 | 4 | 9,0 | 1,500 | 0,013 | 850 | 45 | |
| 8,0 | 4 | 12,0 | 2,000 | 0,018 | 640 | 50 | |
| 10,0 | 4 | 15,0 | 2,500 | 0,026 | 510 | 55 | |
| 12,0 | 4 | 18,0 | 3,000 | 0,035 | 430 | 60 | |
| 16,0 | 4 | 24,0 | 4,000 | 0,046 | 320 | 60 | |
| 20,0 | 4 | 30,0 | 5,000 | 0,058 | 260 | 65 | |

| MAT | 5.1/5.2/5.3 | | | | | | HRC |
|----------------|-------------|------------------------|------------------------|----------------|----------------------|----------------|-----|
| 320-325 | | | | | | | <45 |
| d ₁ | z | a _p max. | a _e max. | f _z | n | v _f | |
| [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] | |
| 6,0 | 4 | 2,0 | - | 0,011 | 750 | 35 | |
| 8,0 | 4 | 2,7 | - | 0,015 | 560 | 35 | |
| 10,0 | 4 | 3,3 | - | 0,021 | 450 | 40 | |
| 12,0 | 4 | 4,0 | - | 0,028 | 380 | 45 | |
| 16,0 | 4 | 5,3 | - | 0,037 | 280 | 45 | |
| 20,0 | 4 | 6,6 | - | 0,046 | 230 | 45 | |

| MAT | 6.1/6.2/6.3 | | | | | | HRC |
|----------------|-------------|------------------------|------------------------|----------------|----------------------|----------------|-----|
| 320-325 | | | | | | | <45 |
| d ₁ | z | a _p max. | a _e max. | f _z | n | v _f | |
| [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] | |
| 6,0 | 4 | 6,0 | 1,200 | 0,011 | 590 | 25 | |
| 8,0 | 4 | 8,0 | 1,600 | 0,015 | 440 | 30 | |
| 10,0 | 4 | 10,0 | 2,000 | 0,021 | 360 | 35 | |
| 12,0 | 4 | 12,0 | 2,400 | 0,028 | 300 | 35 | |
| 16,0 | 4 | 16,0 | 3,200 | 0,037 | 220 | 35 | |
| 20,0 | 4 | 20,0 | 4,000 | 0,046 | 180 | 35 | |

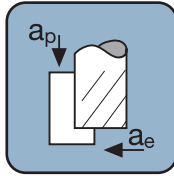
| MAT | 6.1/6.2/6.3 | | | | | | HRC |
|----------------|-------------|------------------------|------------------------|----------------|----------------------|----------------|-----|
| 320-325 | | | | | | | <45 |
| d ₁ | z | a _p max. | a _e max. | f _z | n | v _f | |
| [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] | |
| 6,0 | 4 | 1,8 | - | 0,008 | 540 | 20 | |
| 8,0 | 4 | 2,4 | - | 0,012 | 400 | 20 | |
| 10,0 | 4 | 3,0 | - | 0,017 | 320 | 25 | |
| 12,0 | 4 | 3,6 | - | 0,022 | 270 | 25 | |
| 16,0 | 4 | 4,8 | - | 0,030 | 200 | 25 | |
| 20,0 | 4 | 6,0 | - | 0,037 | 160 | 25 | |



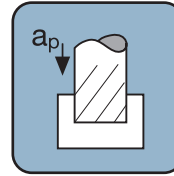
544 364



FUTURA



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| MAT | 1.1/1.2/1.3/2 | | | | | | HRC <20 |
|---------|---------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 9,0 | 1,800 | 0,020 | 3.820 | 235 |
| | 8,0 | 3 | 12,0 | 2,400 | 0,032 | 2.870 | 280 |
| | 10,0 | 3 | 15,0 | 3,000 | 0,045 | 2.300 | 315 |
| | 12,0 | 3 | 18,0 | 3,600 | 0,060 | 1.910 | 345 |
| | 16,0 | 3 | 24,0 | 4,800 | 0,080 | 1.440 | 350 |
| | 20,0 | 3 | 30,0 | 6,000 | 0,100 | 1.150 | 345 |

| MAT | 1.1/1.2/1.3/2 | | | | | | HRC <20 |
|---------|---------------|-----|------------|------------|-------|----------------------|----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 3,0 | - | 0,016 | 3.400 | 170 |
| | 8,0 | 3 | 4,0 | - | 0,026 | 2.550 | 200 |
| | 10,0 | 3 | 5,0 | - | 0,036 | 2.040 | 225 |
| | 12,0 | 3 | 6,0 | - | 0,048 | 1.700 | 245 |
| | 16,0 | 3 | 8,0 | - | 0,064 | 1.280 | 250 |
| | 20,0 | 3 | 10,0 | - | 0,080 | 1.020 | 245 |

| MAT | 1.4/1.5/2 | | | | | | HRC 20-30 |
|---------|-----------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 9,0 | 1,800 | 0,018 | 3.190 | 180 |
| | 8,0 | 3 | 12,0 | 2,400 | 0,029 | 2.390 | 210 |
| | 10,0 | 3 | 15,0 | 3,000 | 0,041 | 1.910 | 235 |
| | 12,0 | 3 | 18,0 | 3,600 | 0,054 | 1.600 | 260 |
| | 16,0 | 3 | 24,0 | 4,800 | 0,072 | 1.200 | 260 |
| | 20,0 | 3 | 30,0 | 6,000 | 0,090 | 960 | 260 |

| MAT | 1.4/1.5/2 | | | | | | HRC 20-30 |
|---------|-----------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 3,0 | - | 0,015 | 2.870 | 130 |
| | 8,0 | 3 | 4,0 | - | 0,023 | 2.150 | 150 |
| | 10,0 | 3 | 5,0 | - | 0,032 | 1.720 | 170 |
| | 12,0 | 3 | 6,0 | - | 0,043 | 1.440 | 190 |
| | 16,0 | 3 | 8,0 | - | 0,058 | 1.080 | 190 |
| | 20,0 | 3 | 10,0 | - | 0,072 | 860 | 190 |

| MAT | 1.4/1.5 | | | | | | HRC 30-38 |
|---------|---------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 9,0 | 1,800 | 0,016 | 2.550 | 125 |
| | 8,0 | 3 | 12,0 | 2,400 | 0,026 | 1.910 | 150 |
| | 10,0 | 3 | 15,0 | 3,000 | 0,036 | 1.530 | 170 |
| | 12,0 | 3 | 18,0 | 3,600 | 0,048 | 1.280 | 185 |
| | 16,0 | 3 | 24,0 | 4,800 | 0,064 | 960 | 185 |
| | 20,0 | 3 | 30,0 | 6,000 | 0,080 | 770 | 185 |

| MAT | 1.4/1.5 | | | | | | HRC 30-38 |
|---------|---------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 3,0 | - | 0,013 | 2.290 | 90 |
| | 8,0 | 3 | 4,0 | - | 0,020 | 1.720 | 110 |
| | 10,0 | 3 | 5,0 | - | 0,029 | 1.370 | 120 |
| | 12,0 | 3 | 6,0 | - | 0,038 | 1.150 | 135 |
| | 16,0 | 3 | 8,0 | - | 0,051 | 860 | 135 |
| | 20,0 | 3 | 10,0 | - | 0,064 | 690 | 135 |

| MAT | 1.4/1.5 | | | | | | HRC 30-45 |
|---------|---------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 6,0 | 1,500 | 0,014 | 1.700 | 75 |
| | 8,0 | 3 | 8,0 | 2,000 | 0,022 | 1.280 | 90 |
| | 10,0 | 3 | 10,0 | 2,500 | 0,032 | 1.020 | 100 |
| | 12,0 | 3 | 12,0 | 3,000 | 0,042 | 850 | 110 |
| | 16,0 | 3 | 16,0 | 4,000 | 0,056 | 640 | 110 |
| | 20,0 | 3 | 20,0 | 5,000 | 0,070 | 510 | 110 |

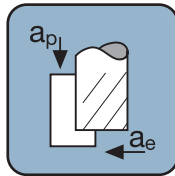
| MAT | 1.4/1.5 | | | | | | HRC 30-45 |
|---------|---------|-----|------------|------------|-------|----------------------|-----------|
| 320-325 | d_1 | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 2,4 | - | 0,011 | 1.540 | 55 |
| | 8,0 | 3 | 3,2 | - | 0,018 | 1.160 | 65 |
| | 10,0 | 3 | 4,0 | - | 0,025 | 930 | 75 |
| | 12,0 | 3 | 4,8 | - | 0,034 | 770 | 80 |
| | 16,0 | 3 | 6,4 | - | 0,045 | 580 | 80 |
| | 20,0 | 3 | 8,0 | - | 0,056 | 470 | 80 |



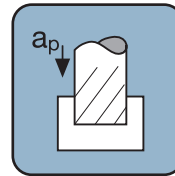
544 364



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| MAT | 1.6 | | | | | | HRC <25 |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 6,0 | 1,500 | 0,016 | 1.910 | 95 |
| | 8,0 | 3 | 8,0 | 2,000 | 0,026 | 1.440 | 115 |
| | 10,0 | 3 | 10,0 | 2,500 | 0,036 | 1.150 | 125 |
| | 12,0 | 3 | 12,0 | 3,000 | 0,048 | 960 | 140 |
| | 16,0 | 3 | 16,0 | 4,000 | 0,064 | 720 | 140 |
| | 20,0 | 3 | 20,0 | 5,000 | 0,080 | 580 | 140 |

| MAT | 1.6 | | | | | | HRC <25 |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 2,4 | - | 0,013 | 1.700 | 70 |
| | 8,0 | 3 | 3,2 | - | 0,020 | 1.280 | 80 |
| | 10,0 | 3 | 4,0 | - | 0,029 | 1.020 | 90 |
| | 12,0 | 3 | 4,8 | - | 0,038 | 850 | 100 |
| | 16,0 | 3 | 6,4 | - | 0,051 | 640 | 100 |
| | 20,0 | 3 | 8,0 | - | 0,064 | 510 | 100 |

| MAT | 4.1/4.2/4.3 | | | | | | <10% Si |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 9,0 | 1,800 | 0,022 | 12.740 | 860 |
| | 8,0 | 3 | 12,0 | 2,400 | 0,035 | 9.550 | 1.010 |
| | 10,0 | 3 | 15,0 | 3,000 | 0,050 | 7.640 | 1.135 |
| | 12,0 | 3 | 18,0 | 3,600 | 0,066 | 6.370 | 1.265 |
| | 16,0 | 3 | 24,0 | 4,800 | 0,088 | 4.780 | 1.265 |
| | 20,0 | 3 | 30,0 | 6,000 | 0,110 | 3.820 | 1.265 |

| MAT | 4.1/4.2/4.3 | | | | | | <10% Si |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 3,0 | - | 0,018 | 11.460 | 620 |
| | 8,0 | 3 | 4,0 | - | 0,028 | 8.600 | 730 |
| | 10,0 | 3 | 5,0 | - | 0,040 | 6.880 | 820 |
| | 12,0 | 3 | 6,0 | - | 0,053 | 5.730 | 910 |
| | 16,0 | 3 | 8,0 | - | 0,070 | 4.300 | 910 |
| | 20,0 | 3 | 10,0 | - | 0,088 | 3.440 | 910 |

| MAT | 5.1/5.2/5.3 | | | | | | HRC <45 |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 6,0 | 1,500 | 0,015 | 1.280 | 60 |
| | 8,0 | 3 | 8,0 | 2,000 | 0,024 | 960 | 70 |
| | 10,0 | 3 | 10,0 | 2,500 | 0,034 | 770 | 80 |
| | 12,0 | 3 | 12,0 | 3,000 | 0,045 | 640 | 90 |
| | 16,0 | 3 | 16,0 | 4,000 | 0,060 | 480 | 90 |
| | 20,0 | 3 | 20,0 | 5,000 | 0,075 | 390 | 90 |

| MAT | 5.1/5.2/5.3 | | | | | | HRC <45 |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 2,0 | - | 0,012 | 1.170 | 45 |
| | 8,0 | 3 | 2,7 | - | 0,019 | 880 | 55 |
| | 10,0 | 3 | 3,3 | - | 0,027 | 710 | 60 |
| | 12,0 | 3 | 4,0 | - | 0,036 | 590 | 65 |
| | 16,0 | 3 | 5,3 | - | 0,048 | 440 | 65 |
| | 20,0 | 3 | 6,6 | - | 0,060 | 360 | 65 |

| MAT | 6.1/6.2/6.3 | | | | | | HRC <45 |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 6,0 | 1,200 | 0,012 | 850 | 35 |
| | 8,0 | 3 | 8,0 | 1,600 | 0,019 | 640 | 40 |
| | 10,0 | 3 | 10,0 | 2,000 | 0,027 | 510 | 45 |
| | 12,0 | 3 | 12,0 | 2,400 | 0,036 | 430 | 50 |
| | 16,0 | 3 | 16,0 | 3,200 | 0,048 | 320 | 50 |
| | 20,0 | 3 | 20,0 | 4,000 | 0,060 | 260 | 50 |

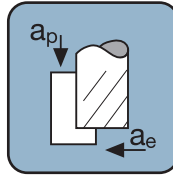
| MAT | 6.1/6.2/6.3 | | | | | | HRC <45 |
|---------|----------------------|----------|---------------------------|---------------------------|----------------------|----------------------|----------------------|
| 320-325 | d₁ | z | a_p max. | a_e max. | f_z | n | v_f |
| | [mm] | [-] | [mm] | [mm] | [mm] | [min ⁻¹] | [mm/min] |
| | 6,0 | 3 | 1,8 | - | 0,010 | 750 | 25 |
| | 8,0 | 3 | 2,4 | - | 0,015 | 560 | 30 |
| | 10,0 | 3 | 3,0 | - | 0,022 | 450 | 30 |
| | 12,0 | 3 | 3,6 | - | 0,029 | 380 | 35 |
| | 16,0 | 3 | 4,8 | - | 0,038 | 280 | 35 |
| | 20,0 | 3 | 6,0 | - | 0,048 | 230 | 35 |



544 365

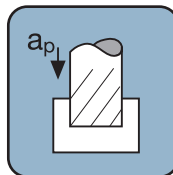


FUTURA



Seitenfräsen
Sidemilling
Contournage
Contornatura

| | | | | | | | | | |
|------------------------------|----------------------------------|------------------------------|----------------------------------|------------------------------|----------------------------------|------------------------------|----------------------------------|------------------------------|--|
| MAT 320-325 | 1.6.1-1.6.5 | | 1.6.6 | | 5 HRC < 45 | | 6 HRC < 45 | | $a_p = 1,0 \times d_1$ $a_e = 0,5 \times d_1$ |
| V_c | 22-28 m/min | | 10-14 m/min | | 5-8 m/min | | 5-8 m/min | | |
| d₁ [mm] | n [min ⁻¹] | f_z [mm] | n [min ⁻¹] | f_z [mm] | n [min ⁻¹] | f_z [mm] | n [min ⁻¹] | f_z [mm] | |
| 4 | 1.750 - 2.230 | 0,035 | 800 - 1.110 | 0,035 | 400 - 640 | 0,035 | 400 - 640 | 0,035 | |
| 5 | 1.400 - 1.780 | 0,045 | 640 - 890 | 0,045 | 320 - 510 | 0,045 | 320 - 510 | 0,045 | |
| 6 | 1.170 - 1.490 | 0,050 | 530 - 740 | 0,050 | 270 - 420 | 0,050 | 270 - 420 | 0,050 | |
| 8 | 880 - 1.120 | 0,065 | 400 - 560 | 0,065 | 200 - 320 | 0,065 | 200 - 320 | 0,065 | |
| 10 | 700 - 890 | 0,080 | 320 - 450 | 0,080 | 160 - 250 | 0,080 | 160 - 250 | 0,080 | |
| 12 | 580 - 740 | 0,130 | 270 - 370 | 0,130 | 130 - 210 | 0,130 | 130 - 210 | 0,130 | |
| 16 | 440 - 560 | 0,165 | 200 - 280 | 0,165 | 100 - 160 | 0,165 | 100 - 160 | 0,165 | |
| 20 | 350 - 450 | 0,210 | 160 - 220 | 0,210 | 80 - 130 | 0,210 | 80 - 130 | 0,210 | |
| 25 | 280 - 360 | 0,260 | 130 - 180 | 0,260 | 60 - 100 | 0,260 | 60 - 100 | 0,260 | |



Nutenfräsen
Slotting
Rainurage
Cave

| | | | | | | | | | |
|------------------------------|----------------------------------|------------------------------|----------------------------------|------------------------------|----------------------------------|------------------------------|----------------------------------|------------------------------|---|
| MAT 320-325 | 1.6.1-1.6.5 | | 1.6.6 | | 5 HRC < 45 | | 6 HRC < 45 | | $a_p = 0,5 \times d_1$ $a_e = 1,0 \times d_1$ Korrekturfaktoren · Correction factors · Facteurs de correction · Fattori di correzione: $a_p \times 0,5 \rightarrow v_f \times 1,25$ |
| V_c | 20-25 m/min | | 8-12 m/min | | 4-7 m/min | | 4-7 m/min | | |
| d₁ [mm] | n [min ⁻¹] | f_z [mm] | n [min ⁻¹] | f_z [mm] | n [min ⁻¹] | f_z [mm] | n [min ⁻¹] | f_z [mm] | |
| 4 | 1.590 - 2.000 | 0,025 | 640 - 960 | 0,025 | 320 - 560 | 0,025 | 320 - 560 | 0,025 | |
| 5 | 1.270 - 1.600 | 0,030 | 510 - 760 | 0,030 | 250 - 450 | 0,030 | 250 - 450 | 0,030 | |
| 6 | 1.060 - 1.330 | 0,040 | 420 - 640 | 0,040 | 210 - 370 | 0,040 | 210 - 370 | 0,040 | |
| 8 | 800 - 1.000 | 0,050 | 320 - 480 | 0,050 | 160 - 280 | 0,050 | 160 - 280 | 0,050 | |
| 10 | 640 - 800 | 0,060 | 250 - 380 | 0,060 | 130 - 220 | 0,060 | 130 - 220 | 0,060 | |
| 12 | 530 - 660 | 0,095 | 210 - 320 | 0,095 | 110 - 190 | 0,095 | 110 - 190 | 0,095 | |
| 16 | 400 - 500 | 0,130 | 160 - 240 | 0,130 | 80 - 140 | 0,130 | 80 - 140 | 0,130 | |
| 20 | 320 - 400 | 0,155 | 130 - 190 | 0,155 | 60 - 110 | 0,155 | 60 - 110 | 0,155 | |
| 25 | 250 - 320 | 0,200 | 100 - 150 | 0,200 | 50 - 90 | 0,200 | 50 - 90 | 0,200 | |





Kernlochtabeln Gewindebohren
Tapping drill sizes machine taps
Diamètres avant trou tarauds machine
Tabella dei prefori maschi a macchina

| M | P | ∅ |
|-------|------|-------|
| M 1 | 0,25 | 0,75 |
| M 1,1 | 0,25 | 0,85 |
| M 1,2 | 0,25 | 0,95 |
| M 1,4 | 0,3 | 1,10 |
| M 1,6 | 0,35 | 1,25 |
| M 1,7 | 0,35 | 1,30 |
| M 1,8 | 0,35 | 1,45 |
| M 2 | 0,4 | 1,60 |
| M 2,2 | 0,45 | 1,75 |
| M 2,3 | 0,4 | 1,90 |
| M 2,5 | 0,45 | 2,05 |
| M 2,6 | 0,45 | 2,10 |
| M 3 | 0,5 | 2,50 |
| M 3,5 | 0,6 | 2,90 |
| M 4 | 0,7 | 3,30 |
| M 4,5 | 0,75 | 3,70 |
| M 5 | 0,8 | 4,20 |
| M 6 | 1 | 5,00 |
| M 7 | 1 | 6,00 |
| M 8 | 1,25 | 6,80 |
| M 9 | 1,25 | 7,80 |
| M 10 | 1,5 | 8,50 |
| M 11 | 1,5 | 9,50 |
| M 12 | 1,75 | 10,20 |
| M 14 | 2 | 12,00 |
| M 16 | 2 | 14,00 |
| M 18 | 2,5 | 15,50 |
| M 20 | 2,5 | 17,50 |
| M 22 | 2,5 | 19,50 |
| M 24 | 3 | 21,00 |
| M 27 | 3 | 24,00 |
| M 30 | 3,5 | 26,50 |
| M 33 | 3,5 | 29,50 |
| M 36 | 4 | 32,00 |
| M 39 | 4 | 35,00 |
| M 42 | 4,5 | 37,50 |
| M 45 | 4,5 | 40,50 |
| M 48 | 5 | 43,00 |
| M 52 | 5 | 47,00 |

| MF | P | ∅ |
|---------|------|-------|
| M 2 x | 0,25 | 1,75 |
| M 2,5 x | 0,35 | 2,15 |
| M 3 x | 0,35 | 2,65 |
| M 3,5 x | 0,35 | 3,15 |
| M 4 x | 0,35 | 3,65 |
| M 4 x | 0,5 | 3,50 |
| M 5 x | 0,5 | 4,50 |
| M 6 x | 0,5 | 5,50 |
| M 6 x | 0,75 | 5,20 |
| M 7 x | 0,75 | 6,20 |
| M 8 x | 0,5 | 7,50 |
| M 8 x | 0,75 | 7,20 |
| M 8 x | 1 | 7,00 |
| M 9 x | 1 | 8,00 |
| M 10 x | 0,75 | 9,20 |
| M 10 x | 1 | 9,00 |
| M 10 x | 1,25 | 8,80 |
| M 11 x | 1 | 10,00 |
| M 12 x | 1 | 11,00 |
| M 12 x | 1,25 | 10,75 |
| M 12 x | 1,5 | 10,50 |
| M 14 x | 1 | 13,00 |
| M 14 x | 1,25 | 12,80 |
| M 14 x | 1,5 | 12,50 |
| M 15 x | 1 | 14,00 |
| M 15 x | 1,5 | 13,50 |
| M 16 x | 1 | 15,00 |
| M 16 x | 1,5 | 14,50 |
| M 18 x | 1 | 17,00 |
| M 18 x | 1,5 | 16,50 |
| M 18 x | 2 | 16,00 |
| M 20 x | 1 | 19,00 |
| M 20 x | 1,5 | 18,50 |
| M 20 x | 2 | 18,00 |
| M 22 x | 1 | 21,00 |
| M 22 x | 1,5 | 20,50 |
| M 22 x | 2 | 20,00 |
| M 24 x | 1 | 23,00 |
| M 24 x | 1,5 | 22,50 |
| M 24 x | 2 | 22,00 |
| M 25 x | 1,5 | 23,50 |
| M 26 x | 1,5 | 24,50 |
| M 27 x | 1,5 | 25,50 |
| M 27 x | 2 | 25,00 |
| M 28 x | 1,5 | 26,50 |
| M 30 x | 1 | 29,00 |
| M 30 x | 1,5 | 28,50 |
| M 30 x | 2 | 28,00 |

| EG-M | P | ∅ |
|----------|------|-------|
| EG M 2,5 | 0,45 | 2,65 |
| EG M 3 | 0,5 | 3,15 |
| EG M 3,5 | 0,6 | 3,70 |
| EG M 4 | 0,7 | 4,20 |
| EG M 5 | 0,8 | 5,25 |
| EG M 6 | 1 | 6,30 |
| EG M 8 | 1,25 | 8,40 |
| EG M 10 | 1,5 | 10,50 |
| EG M 12 | 1,75 | 12,50 |
| EG M 14 | 2 | 14,50 |
| EG M 16 | 2 | 16,50 |

| MJ | P | ∅ |
|---------|------|-------|
| MJ 3 x | 0,5 | 2,60 |
| MJ 4 x | 0,7 | 3,40 |
| MJ 5 x | 0,8 | 4,30 |
| MJ 6 x | 1 | 5,10 |
| MJ 8 x | 1,25 | 6,90 |
| MJ 10 x | 1,5 | 8,70 |
| MJ 12 x | 1,75 | 10,50 |
| MJ 16 x | 2 | 14,30 |



| G | P/1" | ∅ |
|--------------|------|-------|
| G 1/8 - 28 | | 8,80 |
| G 1/4 - 19 | | 11,80 |
| G 3/8 - 19 | | 15,25 |
| G 1/2 - 14 | | 19,00 |
| G 5/8 - 14 | | 21,00 |
| G 3/4 - 14 | | 24,50 |
| G 7/8 - 11 | | 28,25 |
| G 1 - 11 | | 30,75 |
| G 1 1/8 - 11 | | 35,50 |
| G 1 1/4 - 11 | | 39,50 |
| G 1 3/8 - 11 | | 41,90 |
| G 1 1/2 - 11 | | 45,25 |
| G 1 3/4 - 11 | | 51,00 |
| G 2 - 11 | | 57,00 |

| UN-8 | P/1" | ∅ |
|----------------|------|-------|
| UN-8 1 1/8 - 8 | | 25,40 |
| UN-8 1 1/4 - 8 | | 28,50 |
| UN-8 1 1/2 - 8 | | 35,00 |
| UN-8 1 3/4 - 8 | | 41,50 |
| UN-8 2 - 8 | | 48,00 |

| PG | P/1" | ∅ |
|--------------|------|-------|
| Pg 7 - 20 | | 11,40 |
| Pg 9 - 18 | | 14,00 |
| Pg 11 - 18 | | 17,25 |
| Pg 13,5 - 18 | | 19,00 |
| Pg 16 - 18 | | 21,25 |
| Pg 21 - 16 | | 27,00 |
| Pg 29 - 16 | | 35,50 |

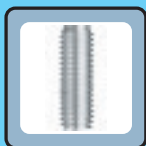
| NPT | P/1" | ∅ |
|---------------|------|-------|
| NPT 1/16 - 27 | | 6,30 |
| NPT 1/8 - 27 | | 8,50 |
| NPT 1/4 - 18 | | 11,10 |
| NPT 3/8 - 18 | | 14,50 |
| NPT 1/2 - 14 | | 17,75 |
| NPT 3/4 - 14 | | 23,20 |
| NPT 1 - 11,5 | | 29,00 |

| UNC | P/1" | ∅ |
|---------------|------|-------|
| UNC # 1 - 64 | | 1,55 |
| UNC # 2 - 56 | | 1,85 |
| UNC # 3 - 48 | | 2,10 |
| UNC # 4 - 40 | | 2,35 |
| UNC # 5 - 40 | | 2,65 |
| UNC # 6 - 32 | | 2,85 |
| UNC # 8 - 32 | | 3,50 |
| UNC # 10 - 24 | | 3,90 |
| UNC # 12 - 24 | | 4,50 |
| UNC 1/4 - 20 | | 5,10 |
| UNC 5/16 - 18 | | 6,60 |
| UNC 3/8 - 16 | | 8,00 |
| UNC 7/16 - 14 | | 9,40 |
| UNC 1/2 - 13 | | 10,80 |
| UNC 9/16 - 12 | | 12,20 |
| UNC 5/8 - 11 | | 13,50 |
| UNC 3/4 - 10 | | 16,50 |
| UNC 7/8 - 9 | | 19,50 |
| UNC 1 - 8 | | 22,25 |
| UNC 1 1/8 - 7 | | 25,00 |

| UNJC | P/1" | ∅ |
|----------------|------|------|
| UNJC # 4 - 40 | | 2,30 |
| UNJC # 6 - 32 | | 2,85 |
| UNJC # 8 - 32 | | 3,50 |
| UNJC # 10 - 24 | | 3,90 |
| UNJC 1/4 - 20 | | 5,25 |
| UNJC 5/16 - 18 | | 6,70 |
| UNJC 3/8 - 16 | | 8,10 |

| UNF | P/1" | ∅ |
|----------------|------|-------|
| UNF # 0 - 80 | | 1,25 |
| UNF # 1 - 72 | | 1,55 |
| UNF # 2 - 64 | | 1,85 |
| UNF # 3 - 56 | | 2,10 |
| UNF # 4 - 48 | | 2,40 |
| UNF # 5 - 44 | | 2,70 |
| UNF # 6 - 40 | | 3,00 |
| UNF # 8 - 36 | | 3,50 |
| UNF # 10 - 32 | | 4,10 |
| UNF # 12 - 28 | | 4,65 |
| UNF 1/4 - 28 | | 5,50 |
| UNF 5/16 - 24 | | 6,90 |
| UNF 3/8 - 24 | | 8,50 |
| UNF 7/16 - 20 | | 9,90 |
| UNF 1/2 - 20 | | 11,50 |
| UNF 9/16 - 18 | | 12,90 |
| UNF 5/8 - 18 | | 14,50 |
| UNF 3/4 - 16 | | 17,50 |
| UNF 7/8 - 14 | | 20,40 |
| UNF 1 - 12 | | 23,25 |
| UNF 1 1/8 - 12 | | 26,50 |
| UNF 1 1/4 - 12 | | 29,50 |
| UNF 1 3/8 - 12 | | 32,75 |
| UNF 1 1/2 - 12 | | 36,00 |

| UNJF | P/1" | ∅ |
|----------------|------|------|
| UNJF # 6 - 40 | | 3,00 |
| UNJF # 8 - 36 | | 3,55 |
| UNJF # 10 - 32 | | 4,15 |
| UNJF 1/4 - 28 | | 5,55 |
| UNJF 5/16 - 24 | | 7,00 |
| UNJF 3/8 - 24 | | 8,60 |



Kernlochtabellen Gewindeformen
Tapping drill sizes forming taps
Diamètres avant trou tarauds à refouler
Tabella dei prefiori maschio a rullare

| M | P | ∅ | | | | | |
|-------|------|-------|-------|-------|-------|-------|-------|
| | | 6HX | | 6GX | | 7GX | |
| | | min. | max. | min. | max. | min. | max. |
| M 1 | 0,25 | 0,89 | 0,91 | | | | |
| M 1,1 | 0,25 | 0,99 | 1,01 | | | | |
| M 1,2 | 0,25 | 1,09 | 1,11 | | | | |
| M 1,4 | 0,3 | 1,27 | 1,29 | | | | |
| M 1,6 | 0,35 | 1,45 | 1,47 | | | | |
| M 1,7 | 0,35 | 1,55 | 1,57 | | | | |
| M 1,8 | 0,35 | 1,65 | 1,67 | | | | |
| M 2 | 0,4 | 1,82 | 1,84 | 1,85 | 1,88 | | |
| M 2,2 | 0,45 | 2,01 | 2,04 | 2,02 | 2,06 | | |
| M 2,3 | 0,4 | 2,12 | 2,14 | | | | |
| M 2,5 | 0,45 | 2,31 | 2,34 | 2,32 | 2,36 | | |
| M 2,6 | 0,45 | 2,41 | 2,44 | | | | |
| M 3 | 0,5 | 2,78 | 2,81 | 2,79 | 2,84 | 2,81 | 2,85 |
| M 3,5 | 0,6 | 3,23 | 3,27 | 3,24 | 3,30 | | |
| M 4 | 0,7 | 3,67 | 3,71 | 3,69 | 3,73 | 3,71 | 3,77 |
| M 4,5 | 0,75 | 4,15 | 4,21 | | | | |
| M 5 | 0,8 | 4,62 | 4,67 | 4,65 | 4,71 | 4,66 | 4,73 |
| M 6 | 1 | 5,50 | 5,56 | 5,55 | 5,63 | 5,56 | 5,64 |
| M 7 | 1 | 6,50 | 6,56 | | | | |
| M 8 | 1,25 | 7,36 | 7,44 | 7,40 | 7,47 | 7,42 | 7,50 |
| M 9 | 1,25 | 8,36 | 8,44 | | | | |
| M 10 | 1,5 | 9,22 | 9,31 | 9,26 | 9,35 | 9,30 | 9,39 |
| M 11 | 1,5 | 10,22 | 10,31 | | | | |
| M 12 | 1,75 | 11,08 | 11,19 | 11,14 | 11,24 | 11,17 | 11,28 |
| M 14 | 2 | 12,96 | 13,08 | 13,00 | 13,12 | 13,04 | 13,16 |
| M 16 | 2 | 14,96 | 15,08 | 15,00 | 15,12 | 15,04 | 15,16 |
| M 18 | 2,5 | 16,66 | 16,81 | | | | |
| M 20 | 2,5 | 18,66 | 18,81 | | | | |
| M 22 | 2,5 | 20,66 | 20,81 | | | | |
| M 24 | 3 | 22,39 | 22,56 | | | | |
| M 27 | 3 | 25,39 | 25,56 | | | | |
| M 30 | 3,5 | 28,09 | 28,28 | | | | |
| M 33 | 3,5 | 31,09 | 31,28 | | | | |
| M 36 | 4 | 33,80 | 34,01 | | | | |
| M 39 | 4 | 36,80 | 37,01 | | | | |
| M 42 | 4,5 | 39,52 | 39,73 | | | | |
| M 45 | 4,5 | 42,52 | 42,73 | | | | |

| MF | P | ∅ | |
|---------|------|-------|-------|
| | | min. | max. |
| | | M 2 x | 0,25 |
| M 2,5 x | 0,35 | 2,35 | 2,37 |
| M 3 x | 0,35 | 2,85 | 2,87 |
| M 3,5 x | 0,35 | 3,35 | 3,37 |
| M 4 x | 0,35 | 3,85 | 3,88 |
| M 4 x | 0,5 | 3,77 | 3,80 |
| M 5 x | 0,5 | 4,77 | 4,80 |
| M 6 x | 0,5 | 5,78 | 5,83 |
| M 6 x | 0,75 | 5,64 | 5,69 |
| M 7 x | 0,75 | 6,64 | 6,69 |
| M 8 x | 0,5 | 7,78 | 7,83 |
| M 8 x | 0,75 | 7,64 | 7,69 |
| M 8 x | 1 | 7,50 | 7,56 |
| M 9 x | 1 | 8,50 | 8,56 |
| M 10 x | 0,75 | 9,64 | 9,69 |
| M 10 x | 1 | 9,50 | 9,56 |
| M 10 x | 1,25 | 9,35 | 9,43 |
| M 11 x | 1 | 10,50 | 10,56 |
| M 12 x | 1 | 11,50 | 11,56 |
| M 12 x | 1,25 | 11,35 | 11,43 |
| M 12 x | 1,5 | 11,21 | 11,30 |
| M 14 x | 1 | 13,52 | 13,58 |
| M 14 x | 1,25 | 13,40 | 13,49 |
| M 14 x | 1,5 | 13,24 | 13,33 |
| M 15 x | 1 | 14,52 | 14,60 |
| M 15 x | 1,5 | 14,26 | 14,36 |
| M 16 x | 1 | 15,52 | 15,58 |
| M 16 x | 1,5 | 15,24 | 15,33 |
| M 18 x | 1,5 | 17,25 | 17,34 |
| M 20 x | 1,5 | 19,25 | 19,34 |
| M 22 x | 1,5 | 21,25 | 21,37 |
| M 24 x | 1,5 | 23,25 | 23,37 |

| G | P/1" | ∅ | |
|------------|------|------------|-------|
| | | min. | max. |
| | | G 1/8 - 28 | |
| G 1/4 - 19 | | 12,43 | 12,53 |
| G 3/8 - 19 | | 15,94 | 16,04 |
| G 1/2 - 14 | | 19,93 | 20,15 |

| UNC | P/1" | ∅ | |
|---------------|------|--------------|-------|
| | | min. | max. |
| | | UNC # 5 - 40 | |
| UNC # 6 - 32 | | 3,09 | 3,17 |
| UNC # 8 - 32 | | 3,76 | 3,84 |
| UNC # 10 - 24 | | 4,26 | 4,35 |
| UNC 1/4 - 20 | | 5,66 | 5,76 |
| UNC 5/16 - 18 | | 7,18 | 7,29 |
| UNC 3/8 - 16 | | 8,66 | 8,78 |
| UNC 7/16 - 14 | | 10,12 | 10,27 |
| UNC 1/2 - 13 | | 11,62 | 11,78 |
| UNC 9/16 - 12 | | 13,14 | 13,28 |
| UNC 5/8 - 11 | | 14,61 | 14,76 |
| UNC 3/4 - 10 | | 17,65 | 17,80 |
| UNC 7/8 - 9 | | 20,66 | 20,84 |
| UNC 1 - 8 | | 23,63 | 23,84 |

| UNF | P/1" | ∅ | |
|---------------|------|--------------|-------|
| | | min. | max. |
| | | UNF # 6 - 40 | |
| UNF # 10 - 32 | | 4,41 | 4,47 |
| UNF 1/4 - 28 | | 5,87 | 5,94 |
| UNF 5/16 - 24 | | 7,39 | 7,47 |
| UNF 3/8 - 24 | | 8,98 | 9,06 |
| UNF 7/16 - 20 | | 10,45 | 10,55 |
| UNF 1/2 - 20 | | 12,05 | 12,14 |
| UNF 9/16 - 18 | | 13,56 | 13,64 |
| UNF 5/8 - 18 | | 15,15 | 15,23 |
| UNF 3/4 - 16 | | 18,22 | 18,30 |
| UNF 7/8 - 14 | | 21,27 | 21,38 |
| UNF 1 - 12 | | 24,26 | 24,37 |

| R _m [N/mm ²] | HV 10 | HB | HRC |
|-------------------------------------|-------|-----|-----|
| 240 | 75 | 71 | – |
| 255 | 80 | 76 | – |
| 270 | 85 | 81 | – |
| 285 | 90 | 86 | – |
| 305 | 95 | 90 | – |
| 320 | 100 | 95 | – |
| 335 | 105 | 100 | – |
| 350 | 110 | 105 | – |
| 370 | 115 | 109 | – |
| 385 | 120 | 114 | – |
| 400 | 125 | 119 | – |
| 415 | 130 | 124 | – |
| 430 | 135 | 128 | – |
| 450 | 140 | 133 | – |
| 465 | 145 | 138 | – |
| 480 | 150 | 143 | – |
| 495 | 155 | 147 | – |
| 510 | 160 | 152 | – |
| 530 | 165 | 157 | – |
| 545 | 170 | 162 | – |
| 560 | 175 | 166 | – |
| 575 | 180 | 171 | – |
| 595 | 185 | 176 | – |
| 610 | 190 | 181 | – |
| 625 | 195 | 185 | – |
| 640 | 200 | 190 | – |
| 660 | 205 | 195 | – |
| 675 | 210 | 199 | – |
| 690 | 215 | 204 | – |
| 705 | 220 | 209 | – |
| 720 | 225 | 214 | – |
| 740 | 230 | 219 | – |
| 755 | 235 | 223 | – |
| 770 | 240 | 228 | – |
| 785 | 245 | 233 | – |
| 800 | 250 | 238 | 22 |
| 820 | 255 | 242 | 23 |
| 835 | 260 | 247 | 24 |
| 860 | 268 | 255 | 25 |
| 870 | 272 | 258 | 26 |
| 900 | 280 | 266 | 27 |

| R _m [N/mm ²] | HV 10 | HB | HRC |
|-------------------------------------|-------|-----|-----|
| 920 | 287 | 273 | 28 |
| 940 | 293 | 278 | 29 |
| 970 | 302 | 287 | 30 |
| 995 | 310 | 295 | 31 |
| 1020 | 317 | 301 | 32 |
| 1050 | 327 | 311 | 33 |
| 1080 | 336 | 319 | 34 |
| 1110 | 345 | 328 | 35 |
| 1140 | 355 | 337 | 36 |
| 1170 | 364 | 346 | 37 |
| 1200 | 373 | 354 | 38 |
| 1230 | 382 | 363 | 39 |
| 1260 | 392 | 372 | 40 |
| 1300 | 403 | 383 | 41 |
| 1330 | 413 | 393 | 42 |
| 1360 | 423 | 402 | 43 |
| 1400 | 434 | 413 | 44 |
| 1440 | 446 | 424 | 45 |
| 1480 | 458 | 435 | 46 |
| 1530 | 473 | 449 | 47 |
| 1570 | 484 | 460 | 48 |
| 1620 | 497 | 472 | 49 |
| 1680 | 514 | 488 | 50 |
| 1730 | 527 | 501 | 51 |
| 1790 | 544 | 517 | 52 |
| 1845 | 560 | 532 | 53 |
| 1910 | 578 | 549 | 54 |
| 1980 | 596 | 567 | 55 |
| 2050 | 615 | 584 | 56 |
| 2140 | 639 | 607 | 57 |
| – | 655 | 622 | 58 |
| – | 675 | – | 59 |
| – | 698 | – | 60 |
| – | 720 | – | 61 |
| – | 745 | – | 62 |
| – | 773 | – | 63 |
| – | 800 | – | 64 |
| – | 829 | – | 65 |
| – | 864 | – | 66 |
| – | 900 | – | 67 |
| – | 940 | – | 68 |

| W-Nr. | DIN (DE) | EN (EU) | NF A (FR) | BS (GB) | UNI (IT) | SS (SE) | UNE (ES) | SAE/ASTM (US) | JIS (JP) |
|--|---------------------|----------------------------------|---------------------------------|----------------------------|-----------------------|------------|------------------------|-----------------------|---------------------------|
| 1 Stähle – Steels – Aciers – Acciai | | | | | | | | | |
| 1.1 Baustähle (Rm < 800 N/mm²) – Structural steels (tensile strength < 800 N/mm²) – Aciers de construction (résistance < 800 N/mm²) – Acciai da costruzione (resistenza < 800 N/mm²) | | | | | | | | | |
| 1.1.1 Allgemeine Baustähle – General structural steels – Aciers mi-dur – Acciai per applicazioni generali | | | | | | | | | |
| 1.0035 | St 33 | – | A 33 | – | Fe 320 | – | AE 235-B | – | – |
| 1.0037 | St 37-2 | S 235 JRG 2 | E 24-2NE | 4360-40 C | Fe 360 B | 1312 | – | A 570 Grade 36 | STKM 12 C |
| 1.0044 | St 44-2 | S 275 JR | E 28-2 | 4360-43 B | Fe 430 BFN | 1412 | AE 275-B | A 570 Grade 40 | – |
| 1.0050 | St 50-2 | E 295 | A 50-2 | 4360-50 B | Fe 490 | 2172 | – | A 570 Grade 50 | SS 50 |
| 1.0060 | St 60-2 | – | A 60-2 | 4360-55 E | Fe 590 | – | – | – | SM 58 |
| 1.0070 | St 70-2 | – | A 70-2 | – | Fe 70-2 | – | A 690-2 | – | – |
| 1.0116 | St 37-3 | Fe 360 D1(2); S 235 J2G3(4) | Fe 360 D1(2); E 24-4 | Fe 360 D1(2); 4360-40 D | Fe 360 D 1(2); Fe37-3 | 1313 | Fe 360 D 1(2); A 360 C | A 573-81 65; Grade 58 | – |
| 1.0120 | St 37 | – | – | – | – | – | – | – | – |
| 1.0140 | St 42 | – | – | – | – | – | – | – | – |
| 1.0144 | St 44-3 | Fe 430 D1(2); S 275 J2 G3 (4) | Fe 430 D1(2); E 28-4 | Fe 430 D1(2); 4360 43 D | Fe 430 D1(2) | 1414 | Fe 430 D 1(2) | A 573-81; Grade 70 | SM 41 C |
| 1.0181 | St 42-2 | – | – | – | – | – | – | – | – |
| 1.0531 | St 50 | – | – | – | – | – | – | – | – |
| 1.0570 | St 52-3 | Fe 510 D1; S 355 J 2 G 3 | Fe 510 D1; E 36-4 | Fe 510 D1; 4360-50 D | Fe 510 D1 | 2134-01 | Fe 510 D 1 | Grade 50 | SM 520 C |
| 1.1.2 Kesselbleche – Boiler plate – Tôles – Piastre per boiler | | | | | | | | | |
| 1.0345 | H I | P 235 GH | A 37 CP; CC 12 | 1501 161 | – | 1330 | F.1110; A 37 RC 1 | A 515 65 | SGV 410, 450, 480, 490 |
| 1.0425 | H II | P 265 GH | A 42 CP; XC 25 | 161-400 | Fe 410 1 KW | 1432 | A 42 RC 1 | – | SGV 410, 450, 480 |
| 1.0435 | H III | P 285 NH | – | – | – | – | – | – | – |
| 1.0445 | H IV | P 295 NH | – | – | – | – | – | – | – |
| 1.1.3 Stahlguss – Cast steel – Fonte d'acier -Acciai fusi | | | | | | | | | |
| 1.0420 | GS-38 | GE 200 | E 24-2 Ne | – | – | 1306 | – | – | – |
| 1.0443 | GS-45 | – | 230-400 M | A 1 | – | 1305 | F.221 | A 27 65-35 | – |
| 1.0552 | GS-52 | GE 260 | AF 55 C 35 | A 2 | – | 1505 | – | A 27 70-36 | – |
| 1.0558 | GS-60 | GE 360; S 355J 0 | AF 65 C 45; E 36-3 | A 3; En 50 C | Fe 510 | 1606 | – | A 148 80-40 | – |
| 1.1.4 Feinkornbaustähle – Fine-grain structural steel – Aciers frittés – Acciai a grana fina | | | | | | | | | |
| 1.0461 | StE 255 | S 255 N | – | – | – | – | – | – | – |
| 1.0582 | StE 355 | P 355 N | – | – | – | – | – | – | – |
| 1.8905 | StE 460 | P 460 N | E 460 RIFP; S 460 N | – | – | – | AE 460 KG | A 633 Grade E | – |
| 1.8907 | StE 500 | S 500 N | – | – | – | – | – | – | – |
| 1.2 Unlegierte und niedriglegierte Stähle (Rm < 800 N/mm²) – Unalloyed and low-alloy steel (tensile strength < 800 N/mm²) – Aciers non alliés et faiblement alliés (résistance < 800 N/mm²) – Acciai non e debolmente legati (resistenza < 800 N/mm²) | | | | | | | | | |
| 1.2.1 Einsatzstähle – Cementation steels – Aciers de cémentation – Acciai da cementazione | | | | | | | | | |
| 1.0301 | C 10 | – | AF 34 C 10; XC 10 | 045 M 10 | C 10 | – | – | 1010 | S 10 C |
| 1.0401 | C 15 | – | AF 37 C 12; XC 12 | 080 M 15 | C 15; C 16 | 1350 | F.111 | 1015 | S 15 C |
| 1.1121 | Ck 10 | 2 C 10 | C 10 E; XC 10 | 045 M 10 | C 10 | 1265 | F.1510 – C 10 k | 1010 | S 10 C |
| 1.1140 | Cm 15 (C 15 R) | C 15 R | C 15 R | C 15 R | C 15 R | C 15 R | – | – | – |
| 1.1141 | Ck 15 | 2 C 15 | C 15 E; XC 12 | 080 M 15 | C 16 | 1370 | F.1511 – C 16 k | 1015 | S 15 C |
| 1.7012 | 13 Cr 2 (EC30) | – | – | – | – | – | – | – | – |
| 1.7015 | 15 Cr 3 (EC60) | – | 12 C 3 | 523 M 15 | – | – | – | 5015 | SCR 415 (H) |
| 1.7131 | 16 MnCr 5 (EC 80) | 16 MnCr 5 | 16 MC 5; 15 D 3 | 527 M 17 | 16 MnCr 5 | 2511 | F.1515 – 16 MnCr 5 | 5115 | SCR 415 |
| 1.2.2 Vergütungsstähle – Heat-treatable steels – Aciers d'amélioration – Acciai da bonifica | | | | | | | | | |
| 1.0402 | C 22 | 1 C 22 | AF 42 C 20; XC 25 | 050 A 20 | C 20; C 21 | 1450 | F.112 | 1020 | S 22 C |
| 1.0501 | C 35 | 1 C 35 | AF 55 C 35; XC 38 | 060 A 35 | C 35 | 1550 | F.113 | 1035 | S 35 C |
| 1.0503 | C 45 | 1 C 45 | AF 65 C 45; CC 45 | 080 M 46 | C 45 | 1650 | F.114; F.5110 | 1043; 1045 | S 45 C |
| 1.0528 | C 30 | 1 C 30 | AF 50 C 30; CC 32 | 080 M 30 | C 30 | – | – | 1030 | S 30 C |
| 1.1151 | Ck 22 | 2 C 22 | C 22 E; XC 25 | 050 A 20; 070 M 20 | C 20 | – | F.1120 – C 25 k | 1023; 1020 | S 22 C |
| 1.1178 | Ck 30 | 2 C 30 | C 30 E; XC 32 | 080 M 30 | C 30 | – | – | 1030 | S 30 C |
| 1.1180 | Cm 35 | 3 C 35 | C 35 R; XC 32 | 080 M 36 | – | 1572-03/04 | F.1135 – C 35 K – 1 | – | – |
| 1.1181 | Ck 35 | 2 C 35 | C 35 E; XC 38 H 1; 320-560 M | 080 A 32; 080 M 36 | C 35 | 1572 | F.1135 – C 35 k | 1035 | S 35 C |
| 1.1191 | Ck 45 | 2 C 45 | C 45 E; XC 42 H 1; XC 45 | 080 M 46 | C 45 | 1672 | F.1140 – C 45 k | 1042; 1045 | S 45 C |
| 1.2.3 Automatenstähle – Free cutting steels – Aciers de décolletage – Acciai automatici | | | | | | | | | |
| 1.0710 | 15 S 10 | – | – | – | – | – | – | – | – |
| 1.0715 | 9 SMn 28 | 11 SMn 28 | S 250 | 230 M 07 | CF 9 SMn 28 | 1912 | F.2111 – 11 SMn 28 | 1213 | SUM 22 |
| 1.0718 | 9 SMnPb 28 | 11 SMnPb 28 | S 250 Pb; 35 MF 4 | – | CF 9 SMnPb 28 | 1914 | F.2112 – 11 SMnPb 28 | 12 L13 | SUM 22 L |
| 1.0721 | 10 S 20 | 10 S 20 | 10 F 1 | 210 M 15 | CF 10 S 20 | – | F.2121 – 10 S 20 | 1108 | – |
| 1.0722 | 10 SPb 20 | 10 SPb 20 | 10 Pb F 2 | – | CF 10 SPb 20 | – | F.2122 – 10 SPb 20 | 11 L 08 | – |
| 1.0723 | 15 S 20 | – | S 300 | 210 A 15 | – | 1922 | F.210.F | – | SUM 32 |
| 1.0726 | 35 S 20 | 35 S 20 | 35 MF 4 | 212 M 36 | – | 1957 | F.210 G | 1140 | – |
| 1.0727 | 45 S 20 | 45 S 20 | 45 MF 4 | 212 M 44 | – | 1973 | – | 1146 | – |
| 1.0736 | 9 SMn 36 | – | S 300 | 240 M 07 | CF 9 SMn 36 | – | F.2113 – 12 SMn 35 | 1215 | – |
| 1.0737 | 9 SMnPb 36 | – | S 300 Pb | – | CF 9 SMnPb 36 | 1926 | F.2114 – 12 SMnPb 35 | 12 L14 | – |
| 1.2.4 Kaltfließpressstähle – Cold flow press steels – Aciers pour extrusion à froid – Acciai estrusi a freddo | | | | | | | | | |
| 1.1132 | Cq 15 | C 15 KD | C 15 C | C15E2C | C15E2C | C15E2C | – | – | SWRCH15K |
| 1.1152 | Cq 22 | C 21 KD | C 22 C | C20E2C | C20E2C | C20E2C | – | – | SWRCH20K |
| 1.1172 | Cq 35 | C 35 KD | C 35 C | – | – | – | – | – | – |
| 1.1192 | Cq 45 | C 45 KD | C 45 C | C45EC | C45EC | C45EC | – | – | SWRCH45K |
| 1.3 Legierte Stähle (Rm < 800 N/mm²) – Alloyed steel (tensile strength < 800 N/mm²) – Aciers alliés (résistance < 800 N/mm²) – Acciai legati (resistenza < 800 N/mm²) | | | | | | | | | |
| 1.3.1 Kaltzähle Baustähle – Cold-tough structural steels – Aciers alliés pour l'usage à froid – Acciai per l'uso a freddo | | | | | | | | | |
| 1.1169 | 20 Mn 6 | – | – | – | – | – | – | – | – |
| 1.4311 | X 2 CrNiN 18 10 | X 2 CrNiN 18 10 | Z 2 CN 18-10 AZ | 304 S 62 | X 2 CrNiN 18 11 | 2371 | F.3541 | 304 LN | SUS 304 LN |
| 1.4406 | X 2 CrNiMoN 17 12 2 | X 3 CrNiMoN 17 12 2 | Z 3 CN 17-12 AZ | 316 S 61 | X 2 CrNiMoN 17 12 | 2375 | F.3543 | 316 LN | SUS 316 LN |
| 1.5622 | 14 Ni 6 | – | 16 N 6 | – | 14 Ni 6 | – | F.2641 – 15 Ni 6 | A 350 – LF 5 | – |
| 1.5633 | 24 Ni 8 | – | 22 N 8 | – | – | – | – | – | – |
| 1.7219 | 26 CrMo 4 | – | 25 CD 4 S | – | – | – | – | – | – |






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|---|-------------------|-------------|-----------------------|-------------------|----------------------|---------|--------------------------|---------------|---------------------|
| 1.3.2 Warmfeste Baustähle – Heat resistant structural steels – Aciers réfractaires – Acciai resistenti al calore | | | | | | | | | |
| 1.0482 | 19 Mn 5 | P 335 GH | A 52 CP; AP; FP | 224-460 | - | 2101 | A 47 RB II | A 537 | - |
| 1.4922 | X 20 CrMoV 12 1 | - | X 20 CrMoV 11 1 | 762 | X 20 CrMoNi 12 01 KG | 2317 | - | - | - |
| 1.5404 | 21 MoV 53 | - | - | - | - | - | - | - | - |
| 1.5406 | 17 MoV 84 | - | - | - | - | - | - | - | - |
| 1.7337 | 16 CrMo 4 4 | - | 15 CD 4.5 | 1501 620 Gr. 27 | 14 CrMo 4 5 | 2216 | - | A 387 12 Cl.2 | - |
| 1.8070 | 21 CrMoV 5 11 | - | - | - | - | - | - | - | - |
| 1.3.3 Nitrierstähle – Nitriding alloy steels – Aciers de nitruration – Acciai da nitrurazione | | | | | | | | | |
| 1.8504 | 34 CrAl 6 | - | - | - | - | - | - | - | - |
| 1.8506 | 34 CrAlS 5 | - | - | - | - | - | - | - | - |
| 1.8515 | 31 CrMo 12 | 31 CrMo 12 | 30 CD 12 | 722 M 24 | 31 CrMo 12 | 2240 | F.1712 – 31 CrMo 12 | - | - |
| 1.8519 | 31 CrMoV 9 | - | 40 CAD 6.12 | - | - | - | - | - | - |
| 1.8550 | 34 CrAlNi 7 | - | - | - | - | - | - | - | - |
| 1.3.4 Vergütungsstähle – Heat-treatable steels – Aciers d'amélioration – Acciai da bonifica | | | | | | | | | |
| 1.1133 | 20 Mn 5 | - | 20 M 5 | 120 M 19 | G 22 Mn 3 | 1410 | F-1515 | 1022; 1518 | SMnC 420 |
| 1.1157 | 40 Mn 4 | - | 35 M 5, 40 M 5 | 150 M 36 | - | - | - | 1039 | - |
| 1.1170 | 28 Mn 6 | - | 20 M 5 | 150 M 28 | C 28 Mn | - | - | 1330 | SCMn 1 |
| 1.7220 | 34 CrMo 4 | 34 CrMo 4 | 34 CD 4 | 708 A 37 | 35 CrMo 4 | 2234 | F.8231-AM – 34 CrMo 4 | 4137; 4135 | SCM 432; SCM 435 |
| 1.7225 | 42 CrMo 4 | 42 CrMo 4 | 42 CD 4; 42 C 4 TS | 708 M 40 | 42 CrMo 4 | 2244 | F.8232 – 42 CrMo 4 | 4140; 4142 | SCM 440 |
| 1.7228 | 50 CrMo 4 | 50 CrMo 4 | - | 708 A 47 | 50 CrMo 4 | - | 50 CrMo 4 | 4150 | SCM 445 (H) |
| 1.3.5 Stahlguss – Cast steel – Fonte d'acier – Acciaio fuso | | | | | | | | | |
| 1.5919 | GS-15 CrNi 6 | - | 16 NC 6 | S 107 | 16 CrNi 4 | - | - | - | - |
| 1.7218 | GS-25 CrMo 4 | 25 CrMo 4 | 25 CD 4 | 708 A 25; CDS 110 | 25 CrMo 4 | 2225 | F.8330-AM – 25 CrMo 4 | 4130 | SCM 420; SCM 430 |
| 1.7220 | GS-34 CrMo 4 | 34 CrMo 4 | 34 CD 4 | 708 A 37 | 35 CrMo 4 | 2234 | F.8231-AM – 34 CrMo 4 | 4137; 4135 | SCM 432; SCM 435 |
| 1.7379 | GS-18 CrMo 9 10 | - | - | - | - | - | - | - | - |
| 1.4 Legierte, vergütete Stähle (Rm 800 – 1200 N/mm²) – Alloyed, pre hardened steels (tensile strength 800 – 1200 N/mm²) – Aciers alliés, améliorés (résistance 800–1200 N/mm²) – Acciaio legato , pre trattato (resistenza 800 – 1200 N/mm²) | | | | | | | | | |
| Legierte, vergütete Stähle (kurzspanend) – Alloyed, pre hardened steels (short chipping) – Aciers alliés, dureté entre (laitons) – Acciaio legato , pre trattato a truciolo corto | | | | | | | | | |
| 1.4.1 Vergütungsstähle – Heat-treatable steels – Aciers d'amélioration – Acciai da bonifica | | | | | | | | | |
| 1.1133 | 20 Mn 5 | - | 20 M 5 | 120 M 19 | G 22 Mn 3 | 1410 | F-1515 | 1022; 1518 | SMnC 420 |
| 1.1157 | 40 Mn 4 V | - | 35 M 5, 40 M 5 | 150 M 36 | - | - | - | 1039 | - |
| 1.1170 | 28 Mn 6 V | - | 35 M 5, 20 M 5 | 150 M 28 | C 28 Mn | - | - | 1330 | SMn 433 |
| 1.7218 | 25 CrMo 4 | 25 CrMo 4 | 25 CD 4 | 708 A 25 | 25 CrMo 4 | 2225 | F.8330-AM – 25 CrMo 4 | 4130 | SCM 420; SCM 430 |
| 1.4.2 Wälzlagerstähle – Roller and ball bearing steels – Aciers laminés – Acciai per cuscinetti | | | | | | | | | |
| 1.3501 | 100 Cr 2 (W1) | - | - | - | - | - | - | - | - |
| 1.3503 | 105 Cr 4 (W2) | - | - | - | - | - | - | E 51100 | - |
| 1.3505 | 100 Cr 6 (W3) | 100 Cr 6 | 100 C 6; 20 NCD 2 | 534 A 99 | 100 Cr 6 | 2258 | F.1310 – 100 Cr 6 | 52100 | SUJ 2, SUJ 4 |
| 1.3520 | 100 CrMn 6 (W4) | 100 CrMn 6 | 100 CM 6 | - | - | - | 100 CrMn 6 | A 485/2 | SUJ 3 |
| 1.3543 | X 102 CrMo 17 | - | - | - | X 105 CrMo 17 | - | X 100 CrMo 17 | - | - |
| 1.4.3 Federstähle – Spring steels – Aciers à ressort – Acciai per molle | | | | | | | | | |
| 1.5022 | 38 Si 6 | - | - | - | - | - | - | - | - |
| 1.5024 | 46 Si 7 | - | - | - | - | - | - | - | - |
| 1.5025 | 51 Si 7 | - | - | - | 51 Si 7 | - | - | - | - |
| 1.5142 | 60 SiMn 5 | - | - | - | - | - | - | - | - |
| 1.7103 | 67 SiCr 5 | - | 60 CS 7 | - | 67 SiCr 5 | - | - | - | - |
| 1.7701 | 51 CrMoV 4 | - | 51 CDV 4 | - | 51 CrMoV 4 | - | - | - | - |
| 1.4.4 Verschleißfeste Stähle – Wear resisting steels – Aciers résistant à l'usure – Acciai resistenti all'usura | | | | | | | | | |
| 1.3401 | X 120 Mn 12 | - | Z 120 M 12 | BW 10 | X G 120 Mn 12 | 2183 | F.82551-AM – X 120 Mn 12 | A 128 75 | SCMnH 1 |
| - | HARDOX 400 | - | - | - | - | - | - | - | - |
| Legierte, vergütete Stähle (langspanend) – Alloyed, pre hardened steels (long chipping) – Aciers alliés, dureté entre (à copeaux longs) – Acciaio legato , pre trattato a truciolo lungo | | | | | | | | | |
| 1.4.5 Vergütungsstähle – Heat-treatable steels – Aciers d'amélioration – Acciai da bonifica | | | | | | | | | |
| 1.7220 | 34 CrMo 4 | 34 CrMo 4 | 34 CD 4 | 708 A 37 | 35 CrMo 4 | 2234 | F.8231-AM – 34 CrMo 4 | 4137; 4135 | SCM 432; SCM 435 |
| 1.7225 | 42 CrMo 4 | 42 CrMo 4 | 42 CD 4; 42 C 4 TS | 708 M 40 | 42 CrMo 4 | 2244 | F.8232 – 42 CrMo 4 | 4140; 4142 | SCM 440 |
| 1.7228 | 50 CrMo 4 | 50 CrMo 4 | - | 708 A 47 | 50 CrMo 4 | - | 50 CrMo 4 | 4150 | SCM 445 (H) |
| 1.4.6 Einsatzstähle – Cementation steels – Aciers de cémentation – Acciai da cementazione | | | | | | | | | |
| 1.7131 | 16 MnCr 5 (EC 80) | 16 MnCr 5 | 16 MC 5; 15 D 3 | 527 M 17 | 16 MnCr 5 | 2511 | F.1515 – 16 MnCr 5 | 5115 | SCR 415 |
| 1.7147 | 20 MnCr 5 | - | 20 MC 5 | - | 20 MnCr 5 | 2523 | F.150.D | 5120 | SMnC 420 (H) |
| 1.7321 | 20 MoCr 4 | 20 MoCr 4 | - | - | 16 NiCrMo 2 | 2506 | - | 8620 | SNCM 220 |
| 1.7325 | 25 MoCr 4 | - | - | - | 20 NiCrMo 2 | - | - | 8625 | - |
| 1.5919 | 15 CrNi 6 | - | 16 NC 6 | S 107 | 16 CrNi 4 | - | - | - | - |
| 1.4.7 Nitrierstähle – Nitriding alloy steels – Aciers de nitruration – Acciai da nitrurazione | | | | | | | | | |
| 1.8504 | 34 CrAl 6 | - | - | - | - | - | - | - | - |
| 1.8507 | 34 CrAlMo 5 | 34 CrAlMo 5 | 30 CAD 6.12 | 905 M 31 | 34 CrAlMo 7 | - | F.1741 – 34 CrAlMo 5 | A 355 Cl. D | - |
| 1.8509 | 41 CrAlMo 7 | 41 CrAlMo 7 | 40 CAD 6.12; Z 8 C 13 | 905 M 39 | 41 CrAlMo 7 | 2940 | F.1740 – 41 CrAlMo 7 | A 355 Cl. A | SACM 645 |
| 1.8515 | 31 CrMo 12 | 31 CrMo 12 | 30 CD 12 | 722 M 24 | 31 CrMo12 | 2240 | F.1712 – 31 CrMo 12 | - | - |
| 1.8550 | 34 CrAlNi 7 | 34 CrAlNi 7 | - | - | - | - | - | A 355 Cl. C | - |
| 1.4.8 Feinkornbaustähle – Fine-grain structural steels – Aciers frittés – Acciai a grana fina | | | | | | | | | |
| 1.8931 | StE 690 V | - | - | - | - | - | - | - | - |
| 1.8941 | StE 960 V | - | - | - | - | - | - | - | - |

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|---|-----------------------|----------------------|----------------------------|--------------------|---------------------|---------|------------------------------|---------------|--------------------|
| 1.5 Werkzeugstähle (Rm < 1300 N/mm²) – Tool steels (tensile strength < 1300 N/mm²) – Aciers à outils (résistance < 1300 N/mm²) – Acciai per utensili (resistenza < 1300 N/mm²) | | | | | | | | | |
| Werkzeugstähle (kurzspanend) – Tool steels (short shipping) – Aciers à outils (laitons) – Acciai per utensili a truciolo corto | | | | | | | | | |
| 1.5.1 Unlegierte Werkzeugstähle – Unalloyed tool steels – Aciers à outils non alliés – Acciai per utensili, non legati | | | | | | | | | |
| 1.1520 | C 70 W1 | C 70 U | – | – | – | – | – | – | – |
| 1.1525 | C 80 W1 | C 80 U | Y190; Y180 | – | C 80 KU | – | – | W108 | – |
| 1.1545 | C 105 W1 | C 105 U | Y 105 | B W 1 A | C 100 KU | 1880 | F.5118 | W 110 | – |
| 1.1554 | C 110 W | C 110 U | – | – | 1407 | – | – | – | – |
| 1.1730 | C 45 W | C 45 U | Y 3 42 | En 43 B | – | – | F.114 | 1045 | – |
| 1.1740 | C 60 W | C 60 U | Y 3 55 | – | – | – | – | – | SK 7 |
| 1.1744 | C 67 W | – | Y 1 70 | – | – | – | F.512 | – | – |
| 1.1820 | C 55 W | – | – | – | – | – | – | – | – |
| 1.5.2 Werkzeugstähle für Kaltarbeit – Tool steels for cold work – Aciers pour travail à froid – Acciai per lavorazioni a freddo | | | | | | | | | |
| 1.2080 | X 210 Cr 12 | X 210 Cr 12 | Z 200 C 12 | BD 3 | X 210 Cr 13 KU | 2710 | F.5212 – X 210 Cr 12 | D 3 | SKD 1 |
| 1.2127 | 105 MnCr 4 | – | – | – | 100 CrMn 4 KU | – | – | – | SUJ 3 |
| 1.2201 | X 165 CrV 12 | – | – | – | – | – | – | – | – |
| 1.2303 | 100 CrMo 5 | – | – | – | – | – | – | L 7 | – |
| 1.2363 | X 100 CrMoV 5 1 | – | Z 100 CDV 5 | BA 2 | X 100 CrMoV 5 1 KU | 2260 | F.5227 – X 100 CrMoV 5 | A 2 | SKD 12 |
| 1.2379 | X155 CrMoV 12 1 | – | Z 160 CDV 12 | BD2 | X 155 CrMoV 12 1 KU | 2310 | F.5211 – X 155 CrMoV 12-1 | D 2 | – |
| 1.2436 | X 210 CrW 12 | X 210 CrW 12 | Z 200 CD 12 | BD 6 | X 215 CrW 12 1 KU | 2312 | F.5213 – X 210 CrW 12 | D 4 (D 6) | SKD 2 |
| 1.2601 | X 165 CrMoV 12 | X 165 CrMoV 12 | – | – | X 165 CrMoV 12 KU | 2310 | F.5211 – X 160 CrMoV 12 | – | – |
| 1.2842 | 90 MnCrV 8 | – | 90 MV 8 | BO 2 | 90 MnVCr 8 KU | – | – | O 2 | – |
| 1.2880 | X 165 CrCoMo 12 | – | – | – | – | – | – | – | – |
| 1.2884 | X 210 CrCoW 12 | – | – | – | – | – | – | – | – |
| – | VANADIS 4 | – | – | – | – | – | – | – | – |
| – | VANADIS 10 | – | – | – | – | – | – | – | – |
| – | CPM 10 V | – | – | – | – | – | – | – | – |
| – | TOOLUX 33 | – | – | – | – | – | – | – | – |
| 1.5.3 Schnellarbeitsstähle – High speed steels – Aciers rapides – Acciai rapidi | | | | | | | | | |
| 1.3243 | S 6-5-2-5 | (HS 6-5-2-5) | 785 WD; KCV 06-05-05-04-02 | – | HS 6-5-2-5 | 2723 | F.5613 6-5-2-5 | M 35 | SKH 55 |
| 1.3343 | S 6-5-2 | HS 6-5-2 | Z 85 WDCV 06-05-04-02 | BM 2 | HS 6-5-2 | 2722 | F.5603 6-5-2 | M 2 | SKH 9; SKH 51 |
| 1.3344 | S 6-5-3 | HS 6-5-3 | Z 120 WDCV 06-05-04-03 | BM 4 | HS 6-5-3 | – | F.5605 6-5-3 | M 3 Cl.2 | SKH 52; SKH 53 |
| 1.3346 | S 2-9-1 | HS 1-8-1 | Z 85 DCWV 08-04-02-01 | BM 1 | HS 1-8-1 | – | – | H 41; M 1 | – |
| 1.3348 | S 2-9-2 | HS 2-9-2 | Z 100 WCWV 09-04-02-02 | – | HS 2-9-2 | 2782 | F.5607 2-9-2 | M 7 | – |
| – | ASP 23 | – | – | – | – | – | – | – | – |
| – | ASP 30 | – | – | – | – | – | – | – | – |
| – | ASP 60 | – | – | – | – | – | – | – | – |
| – | CPM REX M4 | – | – | – | – | – | – | – | – |
| Werkzeugstähle (langspanend) – Tool steels (long shipping) – Aciers à outils (à copeaux longs) – Acciai per utensili a truciolo lungo | | | | | | | | | |
| 1.5.4 Werkzeugstähle für Kaltarbeit – Tool steels for cold work – Aciers pour travail à froid – Acciai per lavorazioni a freddo | | | | | | | | | |
| 1.2083 | X 42Cr 13 | X 42 Cr 13 | Z 40 C 14 | – | X 41 Cr 13 KU | – | – | – | SUS 420 J 2 |
| 1.2312 | 40 CrMnMoS 8 6 | – | – | – | – | – | X 210 CrW 12 | P 20 + 1 | – |
| 1.2316 | X 36CrMo 17 | X 36 CrMo 17 | – | – | X 38 CrMo 16 1 KU | – | X 38 CrMo 16 | – | – |
| 1.5.5 Werkzeugstähle für Warmarbeit – Tool steels for hot work – Aciers pour travail à chaud – Acciai per lavorazioni a caldo | | | | | | | | | |
| 1.2309 | 65 MnCrMo 4 | – | – | – | – | – | – | – | – |
| 1.2311 | 40 CrMnMo 7 | – | – | – | – | – | – | – | – |
| 1.2343 | X 38CrMoV 5 1 | X 38 CrMoV 5 1 | Z 38 CDV 5 | BH 11 | X 37 CrMoV 5 1 KU | – | F.5317 – X 37 CrMoV 5 | H 11 | SKD 6 |
| 1.2344 | X 40 CrMoV 5 1 | – | Z 40 CDV 5 | BH 13 | X 40 CrMoV 5 1 KU | 2242 | F.5318 – X 40 CrMoV 5 | H 13 | SKD 61 |
| 1.2367 | X 38 CrMoV 5 3 | – | – | – | – | – | – | – | – |
| 1.2622 | X 60 WCrMoV 9 4 | – | – | – | – | – | – | – | – |
| 1.2678 | X 45 CrCoWV 5 5 5 | – | – | – | – | – | – | – | – |
| 1.2731 | X 50 NiCrWV 13 13 | – | – | – | – | – | – | – | – |
| 1.2767 | X 45 NiCrMo 4 | – | – | – | 42 NiCrMo 15 7 | – | – | – | – |
| 1.2889 | X 45 CoCrMoV 5 5 3 | – | – | – | – | – | – | – | – |
| 1.2889 | X 45 CoCrMoV 5 5 3 | – | – | – | – | – | – | – | – |
| 1.6 Rost-, säure- und hitzebeständige Stähle – Stainless, acid- and heatproof steels – Aciers inoxydables, résistants aux acides et aciers réfractaires – Acciai inossidabili – resistenti agli acidi e refrattari | | | | | | | | | |
| 1.6.1 Rostfrei, geschwefelt – Stainless steels, sulfur – Inox, soufrés – Acciaio inox sulfureo | | | | | | | | | |
| 1.4104 | X 12 CrMoS 17 | X 14 CrMoS 17 | Z 10 CF 17; Z 6 CT 12 | 420 S 37; 441 S 29 | X 12 CrMoS 17 | 2383 | F.3117 – X 10 CrS 17 | 430 F | SUS 430 F |
| 1.4105 | X 4 CrMoS 18 | X 6 CrMoS 17 | Z 6 CDF 18-02 | X 6 CrMoS 17 | X 6 CrMoS 17 | – | – | 430 FR | – |
| 1.4305 | X 10 CrNiS 18 9 | X 10 CrNiS 18 9 | Z 10 CNF 18-09 | 303 S 31 | X 10 CrNiS 18 9 | 2346 | F.3508 – X 10 CrNiS 18-09 | 303 | SUS 303 |
| 1.4305 | X 10 CrNiS 18 9 | X 10 CrNiS 18 9 | Z 10 CNF 18-09 | 303 S 31 | X 10 CrNiS 18 9 | 2346 | F.3508 – X 10 CrNiS 18-09 | 303 | SUS 303 |
| 1.6.2 Rostfrei, austenitisch – Austenitic stainless steels – Acier inoxydable, austénitique – Acciaio inox austenitico | | | | | | | | | |
| 1.4300 | X 12 CrNi 18 8 | – | – | 302 S 25 | – | – | – | – | – |
| 1.4301 | X 5 CrNi 18 10 | X 5 CrNi 18 10 | Z 6 CN 18-09 | 304 S 15 | X 5 CrNi 18 10 | 2332 | F.3504 – X 5 CrNi 18-10 | 304; 304 H | SUS 304 |
| 1.4308 | X 6 CrNi 18 9 | X 6 CrNi 18 9 | Z 6 CN 18-10 M | 304 C 15 | GX 5 CrNi 19-10 | 2333 | – | 3042 | SCS 13 |
| 1.3956 | X 8 CrNi 18 12 | X 8 CrNi 18 12 | – | 305 S 19 | X 8CrNi 19 10 | – | F.3503 – X 8 CrNi 19-10 | 305 | SUS 305 |
| 1.4312 | G-X 10 CrNi 18 8 | G-X 10 CrNi 18 8 | Z 10 CN 18-09 M | 302 C 25 | – | – | – | – | SCS 12 |
| 1.4406 | X 2 CrNiMoN 17 12 2 | X 3 CrNiMoN 17 12 2 | Z 3 CND 17-12 AZ | 316 S 61 | X 2 CrNiMoN 17 12 | 2375 | F.3543 | 316 LN | SUS 316 LN |
| 1.4408 | X 6 CrNiMo 18 10 | X 6 CrNiMo 18 10 | GX 5 CrNiMo 19-11-2 | 316 C 16; 340 C 15 | GX 5 CrNiMo 19-11-2 | 2343 | F.8414-AM – X 7 CrNiMo 20-10 | CF-8 M | SCS 14 |
| 1.4410 | X 3 CrNiMoN 25 7 4 | X 3 CrNiMoN 25 7 4 | Z 5 CND 20-10 M | – | – | – | – | S 32750 | – |
| 1.4433 | X 2 CrNiMo 18 15 | – | – | – | – | – | – | – | – |
| 1.4435 | X 2 CrNiMo 18 14 3 | X 2 CrNiMo 18 16 | Z 3 CND 18-14-03 | 316 S 13 | X 2 CrNiMo 18 14 3 | 2353 | F.3533-Z – 2 CrNiMo 17-12-03 | 316 L | SUS 316 L / SCS 16 |
| 1.4536 | G-X 2 NiCrMoCuN 25 20 | GX 2 NiCrMoCuN 25 20 | – | – | – | – | – | – | – |
| 1.4541 | X 6 CrNiTi 18 10 | X 6 CrNiTi 18 10 | Z 6 CNT 18-10 | 321 S 31 | X 6 CrNiTi 18 10 | 2337 | F.3523 – X 7 CrNiTi 18-11 | 321 | SUS 321 |
| 1.4550 | G-X 6 CrNiNb 18 10 | G-X 6 CrNiNb 18 10 | Z 6 CNNb 18-10 | 347 S 31 | Z 6 CrNiNb 18-10 | 2338 | F.3552 – X 7 CrNiNb 18-11 | 347 | – |
| 1.4571 | X 6 CrNiMoTi 17 12 2 | X 6 CrNiMoTi 17 12 2 | Z 6 CNDT 17-12-02 | 320 S 31 | X 6 CrNiMoTi 17 12 | 2350 | F.3535 | 316 Ti | SUS 316 Ti |
| 1.4573 | X 10 CrNiMoTi 18 12 | – | – | 320 S 33 | X 6 CrNiMoTi 17 13 | – | – | 316 Ti | – |
| 1.4581 | G-X 5 CrNiMoNb 18 10 | – | Z 4 CNDNb 18-12 M | 318 C 17 | GX 6 CrMoNb 20 11 | – | – | – | SCS 22 |



































| W-Nr. | DIN (DE) | EN (EU) | NF A (FR) | BS (GB) | UNI (IT) | SS (SE) | UNE (ES) | SAE/ASTM (US) | JIS (JP) |
|--|------------------------|---------------------|--------------------|---------------------|------------------|-------------------|----------------------------|----------------------|----------------|
| 1.6.3 Rostfrei, ferritisch – Ferritic stainless steels – Acier inoxydable, ferritique – Acciaio inox ferritico | | | | | | | | | |
| 1.4000 | X 6 Cr 13 | X 6 Cr 13 | Z 6 C 13 | 403 S 17 | X 6 Cr 13 | 2301 | F.3110 – X 6 Cr 13 | 403 | SUS 403 |
| 1.4002 | X 6 CrAl 13 | X 6 CrAl 13 | Z 6 CA 13 | 405 S 17 | X 6 CrAl 13 | 2302 | F.3111 – X 6 CrAl 13 | 405 | SUS 405 |
| 1.4008 | G-X 8 CrNi 13 | (G-X 7 CrNiMo 12-1) | Z 12 CN 13 M | 410 C 21 | GX 12 Cr 13 | - | - | - | SCS 1 |
| 1.4016 | X 6 Cr 17 | X 8 Cr 17 | Z 8 C 17 | 430 S 17 | X 8 Cr 17 | 2320 | F.3113 – X 8 Cr 17 | 430 | SUS 430 |
| 1.4027 | G-X 20 Cr 14 | - | Z 20 C 13 M | 420 C 29 | - | - | - | - | SCS 2 |
| 1.4059 | G-X 22 CrNi 17 | - | Z 20 CN 17-02 M | ANC 2 | - | - | - | - | - |
| 1.4113 | X 6 CrMo 17 | (X 8 CrMo 17) | Z 8 CD 17-01 | 434 S 17 | X 8 CrMo 17 | 2325 | - | 434 | SUS 434 |
| 1.4510 | X 6 CrTi 17 | - | - | - | X 6 CrTi 17 | - | F.3114 – X 8 CrTi 17 | 430 Ti | SUS 430 LX |
| 1.4511 | X 6 CrNb 17 | - | Z 4 CNb 17 | - | X 6 CrNb 17 | - | - | 430 Nb | SUS 430 LX |
| 1.4512 | X 5 CrTi 12 | - | Z 6 CT 12 | 409 S 19 | X 6 CrTi 12 | - | - | 409 | SUH 409 |
| 1.4528 | X 105 CrCoMo 18 2 | - | - | - | - | - | - | - | - |
| 1.4712 | X 10 CrSi 6 | - | - | - | - | - | - | - | - |
| 1.4722 | X 10 CrSi 13 | - | - | - | - | - | - | - | - |
| 1.4762 | X 10 CrAl 24 | - | Z 10 CAS 24 | - | X 16 Cr 26 | 2322 | F.3154 – X 10 CrAl 24 | 446 | SUH 446 |
| 1.6.4 Rostfrei, ferritisch-austenitisch – Ferritic-austenitic stainless steels – Acier inoxydable, ferritique-austénitique – Acciaio inox ferritico-austenitico | | | | | | | | | |
| 1.4460 | X 8 CrNiMo 27 5 | - | Z 5 CND 27-05 AZ | - | - | 2324 | F.3309 – X 8 CrNiMo 27-05 | 329 | SUS 329 J 1 |
| 1.4582 | X 4 CrNiMoNb 25 7 | - | - | - | - | - | - | - | - |
| 1.4821 | X 20 CrNiSi 25 4 | - | Z 20 CNS 25-04 | - | X 20 CrNiSi 25 4 | - | X 20 CrNiSi 25-04 | - | - |
| 1.6.5 Rostfrei, martensitisch – Martensitic stainless steels – Aciers inoxydables martensitique – Acciaio inox martensitico | | | | | | | | | |
| 1.4005 | X 12 CrS 13 | X 12 CrS 13 | Z 12 CF 13 | 416 S 21 | X 12 CrS 13 | 2380 | F.3411 – X 12 CrS 13 | 416 | SUS 416 |
| 1.4006 | X 10 Cr 13 | X 10 Cr 13 | Z 10 C 14 | 410 S 21 | X 12 Cr 13 | 2302 | F.3401 – X 12 Cr 13 | 410 | SUS 410 |
| 1.4021 | X 20 Cr 13 | X 20 Cr 13 | Z 20 C 13 | 420 S 37 | X 20 Cr 13 | 2303 | F.3402 – X 20 Cr 13 | 420 | SUS 420 J 1 |
| 1.4024 | X 15 Cr 13 | X 15 Cr 13 | - | 420 S 29 | X 15 Cr 13 | - | - | 410 | SUS 410 J 1 |
| 1.4028 | X 30 Cr 13 | X 30 Cr 13 | Z 30 C 13 | 420 S 45 | X 30 Cr 13 | 2304 | F.3403 – X 30 Cr 13 | 420 | SUS 420 J 2 |
| 1.4034 | X 46 Cr 13 | X 46 Cr 13 | Z 44 C 14 | (420 S45) | X 40 Cr 14 | - | F.3405 – X 45 Cr 13 | - | - |
| 1.4057 | X 20 CrNi 17 2 | X 19 CrNi 17 2 | Z 15 CN 16-02 | 431 S 29 | X 16 CrNi 16 | 2321 | F.3427 – X 15 CrNi 16 | 431 | SUS 431 |
| 1.4106 | X 10 CrMo 13 | - | X 2 CrMoSiS 18-2-1 | - | - | - | - | - | - |
| 1.4112 | X 90 CrMoV 18 | - | X 89 CrMoV 18-1 | X 89 CrMoV 18 | X 89 CrMoV 18 | - | - | 440 B | SUS 440 B |
| 1.4116 | X 45 CrMoV 15 | - | Z 50 CD 15 | X 50 CrMoV 15 | X 50 CrMoV 16 | - | X 45 CrMoV 15 | - | - |
| 1.4138 | G-X 120 CrMo 29 2 | - | - | - | - | - | - | - | - |
| 1.6.6 Hitzebeständige Stähle – Heat resistant steels – Aciers réfractaires – Acciai refrattari | | | | | | | | | |
| 1.4710 | G-X 30 CrSi 6 | - | - | - | - | - | - | - | - |
| 1.4718 | X 45 CrSi 9 3 | X 45 CrSi 8 | Z 45 CS 9 | 401 S 45 | X 45 CrSi 8 | - | F.3220 – X 4 CrSi 09-03 | HNV 3; HW 3; S 65007 | SUH 1 |
| 1.4729 | G-X 40 CrSi 13 | - | - | - | G X 35 Cr 13 | - | - | - | SCH 1 |
| 1.4747 | X 80 CrNiSi 20 | - | Z 80 CSN 20-02 | 443 S 65 | X 80 CrSiNi 20 | - | F.3222 – X 80 CrSiNi 20-02 | HNV 6 | SUH 4 |
| 1.4825 | G-X 25 CrNiSi 18 9 | - | - | - | - | - | - | - | - |
| 1.4848 | G-X 40 CrNiSi 25 20 | - | - | 310 C 40 | GX 40 CrNi 26 20 | - | F.8452 – AM | 310 S | SCH 21 |
| 2 Gusseisen – Cast iron – Fontes – Ghise | | | | | | | | | |
| 2.1 Gusseisen mit Lamellengraphit (stark abrasiv) – Grey cast iron – Fonte grise – Ghisa grigia | | | | | | | | | |
| 0.6010 | GG-10 | GJL-100 | Ft 10 B; FGL 100 | Grade 100 | G 10 | 0110-00 | FG 10 | A 48-20 B | FC 100 |
| 0.6015 | GG-15 | GJL-150 | Ft 15 D; FGL 150 | Grade 150 | G 15; GS 370-17 | 0115-00 | FG 15 | A 48-25 B | FC 150 |
| 0.6020 | GG-20 | GJL-200 | Ft 20 D; FGL 200 | Grade 200 | G 20 | 0120-00 | FG 20 | A 48-30 B | FC 200 |
| 0.6025 | GG-25 | GJL-250 | Ft 25 D; FGL 250 | Grade 250; 260 | G 25 | 0125-00 | FG 25 | A 48-40 B | FC 250 |
| 2.2 Gusseisen mit Lamellengraphit – Grey cast iron – Fonte grise – Ghisa grigia | | | | | | | | | |
| 0.6030 | GG-30 | GJL-300 | Ft 30 D; FGL 300 | Grade 300 | G 30; GS 700-2 | 0130-00 | FG 30 | A 48-45 B | FC 300 |
| 0.6035 | GG-35 | GJL-350 | Ft 35 D; FGL 350 | Grade 350 | G 35 | 0135-00 | FG 35 | A 48-50 B | FC 350 |
| 0.6040 | GG-40 | GJL-400 | Ft 40 D; FGL 400 | Grade 400 | G 40; GMN 70 | 0140-00 | FG 40 | A 48-60 B | FC 400 |
| 2.3 Kugelgraphitguss, Temperguss – Nodular cast iron, malleable cast iron – Fonte grise à graphite sphéroïdal – Ghisa sferoidale | | | | | | | | | |
| 0.7033 | GGG-35.3 | GJS-350-22 | FGS 370-17 | 350/22 L 40 | GMN 45 | 0717-15 | - | - | - |
| 0.7040 | GGG-40 | GJS-400-15 | FGS 400-15 | SNG 420 / 12 | GS 400-12 | 0717-02 | FGE 38-17 | 60-40-18 | FCD 400 |
| 0.7043 | GGG-40.3 | GJS-400-18 | FGS 370-17 | SNG 370 / 17 | GSO 42/17 | 0717-12 | - | - | FCD 370 |
| 0.7050 | GGG-50 | GJS-500-7 | FGS 500-7 | SNG 500 / 7 | GS 500-7 | 0727-02 | FGE 50-7 | 65-45-12 | FCD 500 |
| 0.7060 | GGG-60 | GJS-600-3 | FGS 600-3 | SNG 600 / 3 | GS 600-3 | 0732-03 | FGE 60-2 | 80-55-06 | FCD 600 |
| 0.8035 | GTW-35-04 | GJMW-350-4 | MB 35-7 | W 340 / 3; W 35-04 | W 35-04 | - | Type B | - | FCMW 330 |
| 0.8040 | GTW-40-05 | GJMW-400-5 | MB 40-10; MB 400-5 | W 410 / 4; W 40-05 | GMB 40 / W40-05 | - | Type A | - | FCMW 370 |
| 0.8045 | GTW-45-07 | GJMW-450-7 | MB 450-7 | W 45-07 | GMB 45 / W45-07 | - | - | - | FCMWP 440 |
| 0.8055 | GTW-55 | - | - | - | GMB 55 | - | - | - | - |
| 0.8065 | GTW-65 | - | - | - | - | - | - | - | - |
| 0.8135 | GTS-35-10 | GJMB-350-10 | MN 350-10 | B 340 / 12; B 35-12 | P 35-10 | 0815-00 | - | 32510 | FCMB 340 |
| 0.8145 | GTS-45-06 | GJMB-450-6 | MN 450-6 | P 440 / 7; P 45-06 | GMN 55 / P45-06 | 0852-00 | - | A220-40010 | FCMP 440 / 490 |
| 0.8155 | GTS-55-04 | GJMB-550-4 | MN 550-4 / MP 50-5 | P 510 / 4; P 55-04 | GMN 65 / P55-04 | 0854-00 | - | A220-50005 | FCMP 540 |
| 0.8165 | GTS-65-02 | GJMB-650-2 | MN 650-3 | P 570 / 3; P 65-02 | GMN 70 / P65-02 | 0856-00 / 0858-00 | - | A220-70003 | FCMP 590 |
| 2.4 Gußeisen mit Vermikulargraphit – Compacted graphite cast iron – Fonte vermiculaire – Ghisa vermicolare | | | | | | | | | |
| - | GGV-30 | EN-GJV-300 | - | - | - | - | - | - | - |
| - | GGV-40 | EN-GJV-400 | - | - | - | - | - | - | - |
| 3 Kupfer / Kupferlegierungen – Copper / Copper alloys – Cuivre / Alliages de cuivre – Rame / leghe di Rame | | | | | | | | | |
| 3.1 Kupfer (unlegiert, niedriglegiert) – Copper – Cuivre (non allié, faiblement allié) – Rame non e dolmente legato | | | | | | | | | |
| 2.0060 | E-Cu 57 | - | Cu-a 1; A 2 | Cu-ETP-2 C 101 | - | - | - | C 11000 | - |
| 2.0070 | SE-Cu | - | Cu-c1 | C 101 | - | - | - | C 10300 | - |
| 2.0090 | SF-Cu | - | Cu-b1 | Cu-DHP C 106 | - | - | - | C 12200 | - |
| 2.1356 | CuMn 3 | - | - | - | - | - | - | - | - |
| 2.1522 | CuSi 2 Mn | - | - | - | - | - | - | - | - |
| 3.2 Kupfer-Legierungen (kurzspanend) – Copper alloys (short chipping) – Alliages de cuivre à copeaux courts (laitons) – Leghe di Rame a truciolo corto | | | | | | | | | |
| 2.0360 | CuZn 40 (Ms60) | - | CuZn 40 (Ms60) | CZ 109 | OT 60 | - | - | C 28000 | - |
| 2.0380 | CuZn 39 Pb 2 (Ms58) | - | MS 58 | CZ 120 | OT 58 | - | - | - | - |
| 2.0410 | CuZn 44 Pb 2 (Ms 56) | - | CuZn 44 Pb 2 | CZ 130 | OT 56 | - | - | C 38500 | - |
| 2.0561 | CuZn 40 Al 1 | - | - | - | - | - | - | - | - |
| 2.0580 | CuZn 40 Mn 1 Pb | - | - | CZ 115 | - | - | - | - | - |
| 2.0771 | CuNi 7 Zn 39 Mn 5 Pb 3 | - | - | - | - | - | - | - | - |
















| W-Nr. | DIN (DE) | EN (EU) | NF A (FR) | BS (GB) | UNI (IT) | SS (SE) | UNE (ES) | SAE/ASTM (US) | JIS (JP) |
|---|-------------------------|------------------|-------------------------------|--------------------|----------|----------|----------|---------------|----------|
| 2.1050 | G-CuSn 10 Zn (Rg 10) | - | - | G 1 | - | - | - | C 90500 | - |
| 2.1086 | G-CuSn 10 | - | - | CT 1 | - | - | - | C 90250 | - |
| 2.1093 | G-CuSn 6 ZnNi | - | - | LG 4 | - | - | - | C 92410 | - |
| 2.1096 | G-CuSn 5 ZnPb (Rg 5) | - | CuPb 5 Sn 5 Zn 5 | LG 2 | - | - | - | C 83600 | - |
| 3.3 Kupferlegierungen (langspanend) – Copper alloys (long chipping) – Alliages de cuivre (à copeaux longs) – Leghe di Rame a truciolo lungo | | | | | | | | | |
| 2.0250 | CuZn 20 (Ms80) | - | CuZn 20 | CZ 103 | OT 80 | - | - | C 24000 | - |
| 2.0265 | CuZn 30 (Ms70) | - | CuZn 30 | CZ 106 | OT 70 | - | - | C 26000 | - |
| 2.0321 | CuZn 37 | - | CuZn 37 | CZ 108 | C 2720 | - | - | C 27400 | - |
| 2.0335 | CuZn 36 (Ms63) | - | CuZn 36 | - | OT 63 | - | - | C 27000 | - |
| 2.1020 | CuSn 6 | - | - | - | - | - | - | - | - |
| 2.1030 | CuSn 8 | - | - | - | - | - | - | - | - |
| 2.1080 | CuSn 6 Zn 6 | - | - | - | - | - | - | - | - |
| 2.1245 | CuBe 1,7 | - | CuBe 1,7 | CB 101 | - | - | - | C 17000 | - |
| 2.1247 | CuBe 2 | - | CuBe 1,9 | - | - | - | - | C 17200 | - |
| 2.1293 | CuCrZr | - | UC 1 Zr | CC 102 | - | - | - | C 18100 | - |
| 2.1525 | CuSi 3 Mn | - | - | - | - | - | - | - | - |
| 3.4 Kupfer-Sonderlegierungen (< 200 HB) – Copper alloys (< 200 HB) – Alliages de cuivre (< 200 HB) – Leghe di Rame speciali (< 200 HB) | | | | | | | | | |
| 2.0916 | CuAl 5 (AlBz 5) | - | - | - | - | - | - | - | - |
| 2.0932 | CuAl 8 Fe 3 (AlBz 8 Fe) | - | CuAl 7 Fe 2 | CA 106 | - | - | - | C 61400 | - |
| 2.0966 | CuAl 10 Ni 5 Fe 4 | - | CuAl 9 Ni 5 Fe 3 Mn; U-A 10 N | CA 104 | - | - | - | C 63200 | - |
| 2.1247 | CuBe 2 Fe 40 | - | CuBe 1,9 | - | - | - | - | C 17200 | - |
| - | AMPCO 8 | - | - | - | - | - | - | - | - |
| - | AMPCO 12 | - | - | - | - | - | - | - | - |
| - | AMPCO 15 | - | - | - | - | - | - | - | - |
| - | AMPCO 16 | - | - | - | - | - | - | - | - |
| 3.5 Kupfer-Sonderlegierungen (200 HB – 300 HB) – Copper alloys (200 HB – 300 HB) – Alliages de cuivre (200 – 300HB) – Leghe di Rame speciali (200 HB – 300 HB) | | | | | | | | | |
| 2.0978 | CuAl 11 Ni 6 Fe 5 | - | CuAl 11 Ni 6 Fe 5 | - | - | - | - | - | - |
| 2.1245 | CuBe 1,7 F55 | - | CuBe 1,7 | CB 101 | - | - | - | C 17000 | - |
| - | AMPCO 18 | - | - | - | - | - | - | - | - |
| - | AMPCO 20 | - | - | - | - | - | - | - | - |
| 3.6 Kupfer-Sonderlegierungen (> 300 HB) – Copper alloys (> 300 HB) – Alliages de cuivre (> 300 HB) – Leghe di Rame speciali (> 300 HB) | | | | | | | | | |
| 2.1245 | CuBe 1,7 F110 | - | CuBe 1,7 | CB 101 | - | - | - | C 17000 | - |
| 2.1247 | CuBe 2 F125 | - | CuBe 1,9 | - | - | - | - | C 17200 | - |
| - | AMPCO 21 | - | - | - | - | - | - | - | - |
| - | AMPCO 22 | - | - | - | - | - | - | - | - |
| - | AMPCO 25 | - | - | - | - | - | - | - | - |
| - | AMPCO 26 | - | - | - | - | - | - | - | - |
| 4 Aluminium / Aluminiumlegierungen – Aluminium / Aluminium alloys – Aluminium / Alliages d' aluminium – Alluminio / Leghe di Alluminio | | | | | | | | | |
| 4.1 Aluminium (unlegiert, niedriglegiert) – Aluminium – Aluminium (non allie-faiblement allié) – Alluminio non e debolmente legato | | | | | | | | | |
| 3.0250 | Al 99,5 H | - | A 59050 C | 1 B; L31 / 34 / 36 | - | 144007 | L-3051 | 1050 A | - |
| 3.0256 | E-Al H | - | A 5 / L | 1 E | - | 144008 | L-3052 | 1350 A | - |
| 3.0280 | Al 99,8 H | - | A 8 | 1 A | - | 144004 | L-3081 | 1080 A | - |
| 3.3308 | Al 99,9 Mg 0,5 | - | A-9-G 0,5 | - | - | - | - | - | - |
| 4.2 Aluminium-Legierungen (< 0,5% Si) – Aluminium alloys (< 0,5% Si) – Alliages d'aluminium (< 0,5% Si) – Leghe di Alluminio (< 0,5% Si) | | | | | | | | | |
| 3.0515 | G-Al 99,5 | - | 3103 | N 3 | 3568 | 144054 | L 3811 | 3103 | - |
| 3.0516 | S-AlMn | - | - | NG 3 | - | 144055 | - | - | - |
| 3.0525 | AlMn 1 Mg 0,5 | - | A – M 1 G 0,5 | - | - | - | - | 3005 | A 3005 |
| 3.0615 | AlMgSiPb | - | 6262 | - | - | - | L 3452 | 6012 | - |
| 3.1325 | AlCuMg 1 | AW-2017 A | A – U 4 G | H 14 | 3579 | - | L-3120 | 2017 A | A 2017 |
| 3.1355 | AlCuMg 2 | AW-2024 | A – U 4 G 1 | 2 L 98 | 3583 | - | L-3140 | 2024 | A 2024 |
| 3.1841 | G-AlCu 4 Ti | - | - | 2 L 91/92 | 3044 | - | - | - | A C 1 A |
| 3.3241 | G-AlMg 3 Si | - | A-G 3 T | - | - | - | L 2341 | 511 | - |
| 3.3292 | GD-AlMg 9 | - | - | - | - | - | - | - | - |
| 3.3315 | AlMg 1 | AW-6082 | A – G 0,6 | N 41 | 5764 | 144106 | L-3350 | 5005 A | A 5005 |
| 3.3535 | AlMg 3 | - | A – G 3 M | N 5 | 3575 | 144133 | L-3390 | 5754 | - |
| 3.4365 | AlZnMgCu 1,5 | - | A – Z 5 GU | 2 L 95 | 3735 | - | L-3710 | 7075 | A 7075 |
| 4.3 Aluminium-Legierungen (0,5% – 10% Si) – Aluminium alloys (0,5% – 10% Si) – Alliages d'aluminium (0,5% – 10% Si) – Leghe di Alluminio (0,5% – 10% Si) | | | | | | | | | |
| 3.2134 | GD-AlSi 5 Cu 1 Mg | - | A – S 4 Gu | LM 16 | 3600 | - | L-2571 | 355,1 | A C 4 D |
| 3.2152 | GD-AlSi 6 Cu 4 | - | A – S 5 U | LM 4 – LM 22 | - | 4230 | L-2660 | 319,2 | - |
| 3.2162 | GD-AlSi 8 Cu 3 | - | A – S 9 U 3 | LM 24 | - | 4252 | L-2630 | 380,1 | - |
| 3.2373 | G-AlSi 9 Mg | - | A 7 – S 10 G | - | 3051 | 4235 | - | - | A C 4 A |
| 4.4 Aluminium-Legierungen (10% – 15% Si) – Aluminium alloys (10% – 15% Si) – Alliages d'aluminium (10% – 15% Si) – Leghe di Alluminio (10% – 15% Si) | | | | | | | | | |
| 3.2381 | G-AlSi 10 Mg | - | A – S 10 G | LM 9 | - | 4253 | L-2560 | A 360 | - |
| 3.2383 | G-AlSi 10 Mg (Cu) | - | A – S 10 UG | LM 9 | - | 4253 | - | A 360,2 | A D C 3 |
| 3.2581 | G-AlSi 12 | - | A – S 13 | LM 6 | 4514 | 4261 | L-2520 | A 413,2 | A C 3 A |
| 3.2583 | G-AlSi 12 (Cu) | - | A – S 12 U | LM 20 | 3048 | 4260 | L-2530 | A 413,1 | A D C 1 |
| 3.2982 | GD-AlSi 12 (Cu) | - | - | - | - | - | - | - | - |
| 3.5106 | G-MgAg 3 SE 2 Zr 1 | MCMgRE 2 Ag 2 Zr | G-Ag 22,5 | MAG 12 | - | - | - | QE 22 | - |
| 3.5562 | G-MgAl 6 | - | - | - | - | - | - | - | - |
| 3.5812 | GD-MgAl 8 Zn 1 | MCMgAl 8 Zn 1 | G-A 9 | MAG 1 | AZ 81 hp | AZ 81 hp | AZ 81 hp | AZ 81 | AZ 81 hp |
| 3.5912 | GD-MgAl 9 Zn 1 | MCMgAl 9 Zn 1 | G-A 9 Z 1 | MAG 7 | AZ 91 hp | - | - | AZ 91 | - |
| 4.5 Aluminium-Legierungen (> 15% Si) – Aluminium alloys (> 15% Si) – Alliages d'aluminium (> 15% Si) – Leghe di Alluminio (> 15% Si) | | | | | | | | | |
| - | G-AlSi 17 Cu 4 | - | - | - | - | - | - | 390 | - |
| - | G-AlSi 21 CuNiMg | - | - | LM 28 | - | - | - | - | - |
| - | G-AlSi 25 CuNiMg | - | - | LM 29 | - | - | - | 393 | - |

| W-Nr. | DIN (DE) | EN (EU) | NF A (FR) | BS (GB) | UNI (IT) | SS (SE) | UNE (ES) | SAE/ASTM (US) | JIS (JP) |
|--|--------------------------|---------------|-------------------|------------------------------|----------|---------|----------|----------------------------|----------|
| 5 Titan / Titanlegierungen – Titanium / Titanium alloys – Titane / Alliages de titane – Titanio / Leghe di Titanio | | | | | | | | | |
| 5.1 Reintitan – Pure titanium – Titane pur – Titanio puro | | | | | | | | | |
| 3.7024.1 LN | Ti 99,5 | - | T – 60 | TA – 6 / 7 / 8 / 9 | - | - | Ti – PO4 | 4901 / 21 | - |
| 3.7034.1 LN | Ti 99,7 | - | T – 40 | TA – 2 / 3 / 4 / 5 | - | - | Ti – PO2 | 4941 / 42 / 51 / 4902 | - |
| 3.7055 | Ti 99,4 | - | T – 50 | TA 3 | - | - | - | R 50550 | - |
| 3.7064.1 LN | Ti 99,2 | - | T – 60 | 2 TA – 6 / 7 / 8 / 9 | - | - | - | - | - |
| 5.2 Titanlegierungen (Rm < 900 N/mm²) – Titanium alloys (tensile strength < 900 N/mm²) – Alliages de titane (résistance < 900 N/mm²) – Leghe di Titanio (resistenza < 900 N/mm²) | | | | | | | | | |
| 3.7114 LN | TiAl 5 Sn 2 | - | - | - | - | - | - | - | - |
| 3.7124 LN | TiCu 2 | - | T – U 2 | 2 TA.21-24; TA.52-55 / 58 | - | - | Ti – P11 | - | - |
| 3.7163 LN | TiAl 6 V 4 | - | T – A 6 V | TA.10-13 / 28 / 56 | - | - | Ti-P63 | 491128 / 35 / 54 / 65 / 67 | - |
| 3.7174 LN | TiAl 6 V 6 Sn 2 | - | - | - | - | - | - | - | - |
| 5.3 Titanlegierungen (Rm 900 – 1500 N/mm²) – Titanium alloys (tensile strength 900 – 1500 N/mm²) – Alliages de titane (résistance 900 – 1500 N/mm²) – Leghe di Titanio (resistenza 900 – 1500 N/mm²) | | | | | | | | | |
| 3.7124 LN | TiCu 2 | - | T – U 2 | 2 TA.21-24; TA.52-55 / 58 | - | - | Ti – P11 | - | - |
| 3.7144 LN | TiAl 6 Sn 2 Zr 4 Mo 2 | - | - | - | - | - | - | - | - |
| 3.7154 LN | TiAl 6 Zr 5 | - | T – A 6 ZD | TA.43 / 44 | - | - | Ti – P67 | - | - |
| 3.7164 LN | TiAl 5 V 4 | - | - | - | - | - | - | - | - |
| 3.7164 LN | TiAl 6 V 4 | - | T – A 6 V | TA.10-13 / 28 / 56 | - | - | Ti-P63 | 491128 / 35 / 54 / 65 / 67 | - |
| 3.7174 LN | TiAl 6 V 6 Sn 2 | - | - | - | - | - | - | - | - |
| 3.7184 LN | TiAl 4 Mo 4 Sn 2 | - | T – A 4 DE | TA.45-51 / 57 | - | - | Ti – P68 | - | - |
| 6 Nickel / Nickellegierungen – Nickel / Nickel alloys – Nickel / Alliages de nickel – Nickel / Leghe di Nickel | | | | | | | | | |
| 6.1 Reinnickel – Pure nickel – Nickel pur – Nickel puro | | | | | | | | | |
| 2.1504 LN | NiAlBz | - | - | - | - | - | - | - | - |
| 2.4042 | Ni 99 CSI | - | - | - | - | - | - | - | - |
| 2.4060 | Ni 99,6 | - | - | NA 46 | - | - | - | - | - |
| 2.4062 | Ni 99,4 Fe | - | - | - | - | - | - | - | - |
| 6.2 Nickellegierungen (Rm < 900 N/mm²) – Nickel alloys (tensile strength < 900 N/mm²) – Alliages de Nickel (résistance < 900 N/mm²) – Leghe di Nickel (resistenza < 900 N/mm²) | | | | | | | | | |
| 2.4360 | NiCu 30 Fe | Monel 400 | NU 30 | NA 13 | - | - | - | N 04400 | - |
| 2.4374 LN | - | Monel 500 | - | - | - | - | - | - | - |
| 2.4617 | NiMo 28 | Hastelloy B 2 | NiMo 28 | NA 14 | - | - | - | N 10665 | - |
| 2.4665 | NiCr 22 Fe 18 Mo | Hastelloy X | NC 22 FeD | HR 6 / 204 | - | - | MH-03 | 5536E | - |
| 2.4812 | - | Hastelloy C | - | - | - | - | - | - | - |
| 2.4816 | NiCr 15 Fe | Inconel 600 | NC 15 Fe | NA 14 | - | - | - | 5540 | NCF 600 |
| 2.4876 | - | Inconel 800 | - | - | - | - | - | - | - |
| 2.4983 | NiCr 18 Co 18 MoTi | Inconel 500 | NCK 19 DAT | - | - | - | - | 684 | - |
| 6.3 Nickellegierungen (Rm 900 – 1500 N/mm²) – Nickel alloys (tensile strength 900 – 1500 N/mm²) – Alliages de Nickel (résistance 900 – 1500 N/mm²) – Leghe di Nickel (resistenza 900 – 1500 N/mm²) | | | | | | | | | |
| 2.4631 | NiCr 20 TiAl | Nimonic 80A | NC 20 TA | HR 401 | - | - | MH-07 | - | NCF 80 A |
| 2.4632 | NiCr 20 Co 18 Ti | Nimonic 90 | - | BA 19 | - | - | - | - | - |
| 2.4634 | NiCo 20 Cr 15 MoAlTi | Nimonic 105 | NCKD 20 ATV | HR 3 / 5007 | - | - | MH-14 | - | - |
| 2.4662 | - | Nimonic 901 | Z 8 NCDT 42 | MH 16 | - | - | MH-16 | 5660 C | - |
| 2.4668 | NiCr 19 FeNbMo | Inconel 718 | NC 19 Fe Nb | HR 8 | - | - | MH-06 | N 07718 | NCF 718 |
| 2.4670 LN | G – NiCr 13 Al 6 MoNb | Nimocast 713 | NC 13 AD | HC 203 | - | - | MH-31 | 5391 A | - |
| 2.4674 LN | NiCo 15 Cr 10 MoAlTi | Nimocast PK24 | NK 15 CAT | HC 204 | - | - | - | 5397 | - |
| 2.4856 | NiCr 22 Mo 9 Nb | Inconel 625 | NC 22 FeDNB | NA 21 | - | - | - | 5581 / N 06625 | NCF 625 |
| 2.6554 | - | Waspaloy | - | - | - | - | - | - | - |
| 7 Kunststoffe – Plastics – Plastiques – Materie plastique | | | | | | | | | |
| 7.1 Thermoplaste – Thermoplastics – Thermoplastiques – Termoplastiche | | | | | | | | | |
| - | Ultramit | - | - | - | - | - | - | - | - |
| - | Makralon | - | - | - | - | - | - | - | - |
| - | Hostalen | - | - | - | - | - | - | - | - |
| - | Degolan | - | - | - | - | - | - | - | - |
| - | Polystyrol | - | Polystyrène | Styrene | - | - | - | - | - |
| - | Hostaform | - | - | - | - | - | - | - | - |
| 7.2 Duroplaste und Pressstoffe – Thermosetting polymers and pressed materials – Duroplastiques – Polimeri termoindurenti e materiali pressati | | | | | | | | | |
| - | Bakelit | - | - | - | - | - | - | - | - |
| - | Pertinax | - | - | - | - | - | - | - | - |
| - | Ferrozell | - | - | - | - | - | - | - | - |
| - | Resopal | - | Résopal – Formica | Formica | - | - | - | - | - |
| - | Albanit | - | - | - | - | - | - | - | - |
| 7.3 Faserverstärkte Kunststoffe – Reinforced plastics – Matières synthétiques, renforcées par des fibres de verre – Plastiche rinforzate | | | | | | | | | |
| - | CFK Kohlefaserverstärkt | - | - | - | - | - | - | - | - |
| - | GFK Glasfaserverstärkt | - | - | - | - | - | - | - | - |
| - | AFK Aramidfaserverstärkt | - | - | - | - | - | - | - | - |
| 8 Hartstoffe – Hardened materials – Matières dures (trempées) – Materiali duri | | | | | | | | | |
| 8.1 Metallkeramiken – Metal ceramics – Matières dures, à base céramique – Materiali a base ceramica | | | | | | | | | |
| - | Ferrotic | - | - | - | - | - | - | - | - |
| - | Ferrotitanit | - | - | - | - | - | - | - | - |
| 8.2 Gehärtete Stähle der Werkstoffgruppen 1.5 und 1.6.2 (50 – 65 HRC) – Hardened steels of groups 1.5 and 1.6.2 (50 – 65 HRC) – Aciers traités des groupes de matières 1.5 et 1.6.2 (50 – 65 HRC) – Acciai temprati del gruppo di materiali 1.5 e 1.6.2 (50-65 HRC) | | | | | | | | | |
| 8.2.1 45 – 55 HRC | | | | | | | | | |
| - | HARDOX 500 | - | - | - | - | - | - | - | - |
| - | TOOLUX 44 | - | - | - | - | - | - | - | - |
| 8.2.2 55 – 60 HRC | | | | | | | | | |
| 8.2.3 60 – 65 HRC | | | | | | | | | |

| | | | | | |
|------------------|--|-------------------------|---|---|---|
| Typ WM | Für weiche, gut spanbare Werkstoffe ≤ 800 N/mm ² For mild and easy to cut materials ≤ 800 N/mm ² Pour aciers mi durs ≤ 800 N/mm ² , faciles à usiner Per materiali dolci, a truciolo lungo, fino ≤ 800 N/mm ² | HSSE Co5 | Hochleistungsschnellarbeitsstahl HSSE-Co5 High speed steel HSSE-Co5 Acier rapide HSSE-Co5 Acciaio super rapido HSSE-Co5 | CrN | Chrom-Nitrid Chromium nitride Nitrure de chrome Nitruro di cromo |
| Typ N | Für gut spanbare Werkstoffe ≤ 800 N/mm ² For easy to cut materials ≤ 800 N/mm ² Aciers mi durs ≤ 800 N/mm ² Per materiali vari fino ≤ 800 N/mm ² | HSSE Co8 | Hochleistungsschnellarbeitsstahl HSSE-Co8 High speed steel HSSE-Co8 Acier rapide HSSE-Co8 Acciaio super rapido HSSE-Co8 | FUTURA | Titan-Aluminiumnitrid Titanium aluminium nitride Nitrure de titane-aluminium Nitruro di Titanio-Alluminio |
| Typ VA | Für rostfreie Materialien und Stähle höherer Festigkeit For stainless materials and steels of higher tensile strength Pour matériaux inoxydables et aciers à haute résistance Per acciai inox e ad alta resistenza | HSSE V3 | Hochleistungsschnellarbeitsstahl HSSE-V3 High speed steel HSSE-V3 Acier rapide HSSE-V3 Acciaio super rapido HSSE-V3 | FUTURA TOP | Spezial-Titan-Aluminiumnitrid Special titanium aluminium nitride Nitrure de titane-aluminium, spécial Nitruro di Titanio-Alluminio speciale |
| Typ ALU | Für Aluminium For aluminium Pour aluminium Per alluminio | HSSE PM | Pulverstahl Powder steel Acier fritté Acciaio sinterizzato | FT | Spezial-Titan-Aluminiumnitrid Special titanium aluminium nitride Nitrure de titane-aluminium, spécial Nitruro di Titanio-Alluminio speciale |
| Typ GG | Für Grauguss For cast iron Pour fontes grises Per ghise | PS 55 | Pulverstahl PS 55 Powder steel PS 55 Acier fritté PS 55 Acciaio sinterizzato PS 55 | TiAlN | Titan-Aluminiumnitrid Titanium aluminium nitride Nitrure de titane-aluminium Nitruro di Titanio-Alluminio |
| Typ UNI | Für universellen Einsatz For universal use Pour utilisation universelle Per uso universale | PS 105 | Pulverstahl PS 105 Powder steel PS 105 Acier fritté PS 105 Acciaio sinterizzato PS 105 | AlTiN-TiSiN | Aluminiumtitannitrid – Titansiliziumnitrid Aluminium titanium nitride – Titanium silicon nitride Nitrure de titane d'aluminium – Nitrure de silicium de titane Nitruro di Titanio Alluminio – Nitruro di Titanio Silicio |
| Typ H | Für kurzspanende, hochfeste Werkstoffe For short-chipping, tensile strength Pour matériaux à haute résistance Per materiali a resistenza alla trazione | VHM | Vollhartmetall Solid carbide Carbure monobloc Metallo duro integrale | DIN 1835 B | Schaftausführung nach DIN 1835 B (Weldon) Shank design according to DIN 1835 B (Weldon) Queue selon DIN 1835 B (Weldon) Gambo secondo DIN 1835 B (Weldon) |
| Typ Ti | Für Titan For titanium Pour titane Per titanio | WEXO | Baumaße nach Werksnorm Dimensions acc. internal standard Dimensions selon norme usine Dimensioni sec. norme interne | d₂=h6 | Schaft nach Toleranzklasse h6 Shank acc. to tolerance class h6 Queue selon classe de tolérance h6 Gambo secondo tolleranza h6 |
| Typ Ni | Für Nickel For nickel Pour nickel Per nickel | N/mm² | Zugfestigkeit in N/mm ² Tensile strength in N/mm ² Résistance à la traction N/mm ² Resistenza alla trazione in N/mm ² | MAT | Werkstoffgruppe Classification of work materials Groupe de matières Gruppo materiali |
| Typ HS | Für synchrones Gewindeschneiden For synchronous tapping Pour le taraudage synchronisé Per maschiatura sincronizzata | HRC | Härte in Rockwell Strength in Rockwell Dureté in Rockwell Durezza in Rockwell | V_c | Schnittgeschwindigkeit Cutting speed Vitesse de coupe Velocità di taglio |
| Typ W/45° | Für weiche, langspanende Werkstoffe For mild, long chipping materials Pour matériaux douces et à copeaux longs Per materiali dolci (truciolo lungo) | ≤ 45 HRC | Härte in Rockwell Strength in Rockwell Dureté in Rockwell Durezza in Rockwell |  | Emulsion Emulsion Emulsion Emulsione |
| IKA | Innenkühlung axial Internal coolant axial Arrosage centralisé axial Lubrificazione interna assial | OX | Vaporisiert Steam oxidized Vaporisé Vaporizzato |  | Schneidöl Cutting oil Huile de coupe Olio da taglio |
| IKR | Innenkühlung radial Internal coolant radial Arrosage centralisé radial Lubrificazione interna radial | Ni-OX | Nitriert und vaporisiert Nitrided and steam oxidized Nitruré et vaporisé Nitrurato e vaporizzato |  | Minimalmengenschmierung Mist coolant supply Micro-lubrication Lubrificazione minimale |
| IKZ | Mit Innenkühlung With internal coolant Arrosage centralisé Lubrificazione interna | TiN | Titan-Nitrid Titanium nitride Nitrure de titane Nitruro di titanio |  | Trockenbearbeitung Dry machining Usinage à sec Lavorazione a secco |
| HSS | Hochleistungsschnellarbeitsstahl High speed steel Acier rapide Acciaio super rapido | TiCN | Titan-Carbonitrid Titanium carbonitride Carbonitrure de titane Carbonitruro di titanio |  | Pressluft Compressed air Air comprimé Aria compressa |
| HSSE | Hochleistungsschnellarbeitsstahl High speed steel Acier rapide Acciaio super rapido | HARDLUBE | Hartstoffschicht mit Gleit-Deckschicht Hard surface coating with anti-friction layer Revêtement dur avec couche anti-frottement Base TiAlN con strato autolubrificante | | |
| HSSE Co | Hochleistungsschnellarbeitsstahl HSSE-Co High speed steel HSSE-Co Acier rapide HSSE-Co Acciaio super rapido HSSE-Co | STiN | Spezial-Titan-Nitrid Special titanium nitride Nitrure de titane, spécial Nitruro di titanio speciale | | |

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|-------------|--|-----------------|--|-------------------|--|
| M | Metrisches ISO-Regelgewinde DIN 13 ISO Metric coarse thread DIN 13 Filetage métrique ISO DIN 13 Metrica ISO-passo grosso DIN 13 | RH | Rechtsschneidend Right hand thread Rotation à droite Filettatura destra | DIN 352 | Baumaße nach DIN 352 Dimensions acc. DIN 352 Dimensions selon DIN 352 Dimensioni sec. DIN 352 |
| MF | Metrisches ISO-Feingewinde DIN 13 ISO Metric fine thread DIN 13 Filetage métrique fin ISO DIN 13 Metrica ISO-passo fine DIN 13 | LH | Linksschneidend Left hand thread Rotation à gauche Filettatura sinistra | DIN 357 | Baumaße nach DIN 357 Dimensions acc. DIN 357 Dimensions selon DIN 357 Dimensioni sec. DIN 357 |
| MJ | Metrisches MJ-Gewinde Metric MJ-thread Filetage MJ Metrica MJ | SN | Schmiernut Lubrication groove Rainure de graissage Scanalatura per lubrificazione | DIN 371 | Baumaße nach DIN 371 Dimensions acc. DIN 371 Dimensions selon DIN 371 Dimensioni sec. DIN 371 |
| EG-M | Metrisches Einsatz-Gewinde für Gewindeeinsätze aus Draht Metric insert thread for wire inserts Filetage métrique pour inserts Metrica – per filetti riportati | ISO 1 4H | Toleranzklasse ISO1(4H) Tolerance class ISO1(4H) Classe de tolérance ISO1(4H) Tolleranza ISO1(4H) | DIN 374 | Baumaße nach DIN 374 Dimensions acc. DIN 374 Dimensions selon DIN 374 Dimensioni sec. DIN 374 |
| G | Whitworth-Rohrgewinde DIN ISO 228 Whitworth pipe thread DIN ISO 228 Filetage Whitworth Gaz DIN ISO 228 Whitworth-gas DIN ISO 228 | ISO 2 6H | Toleranzklasse ISO2(6H) Tolerance class ISO2(6H) Classe de tolérance ISO2(6H) Tolleranza ISO2(6H) | DIN 376 | Baumaße nach DIN 376 Dimensions acc. DIN 376 Dimensions selon DIN 376 Dimensioni sec. DIN 376 |
| UNC | UNC-Gewinde ANSI-B 1.1 UNC thread ANSI-B 1.1 Filetage UNC ANSI-B 1.1 UNC-passo grosso ANSI-B 1.1 | 6HX | Toleranzklasse 6HX Tolerance class 6HX Classe de tolérance 6HX Tolleranza 6HX | DIN 2174 | Baumaße nach DIN 2174 Dimensions acc. DIN 2174 Dimensions selon DIN 2174 Dimensioni sec. DIN 2174 |
| UNJC | UNJC-Gewinde ANSI-B 1.1 UNJC thread ANSI-B 1.1 Filetage UNJC ANSI-B 1.1 UNJC-passo grosso ANSI-B 1.1 | 6H mod | Toleranzklasse 6H mod Tolerance class 6H mod Classe de tolérance 6H mod Tolleranza 6H mod | DIN 2181 | Baumaße nach DIN 2181 Dimensions acc. DIN 2181 Dimensions selon DIN 2181 Dimensioni sec. DIN 2181 |
| UNF | UNF-Gewinde ANSI-B 1.1 UNF thread ANSI-B 1.1 Filetage UNF ANSI-B 1.1 UNF-passo fine ANSI-B 1.1 | ISO 3 6G | Toleranzklasse ISO3(6G) Tolerance class ISO3(6G) Classe de tolérance ISO3(6G) Tolleranza ISO3(6G) | DIN 2184-1 | Baumaße nach DIN 2184-1 Dimensions acc. DIN 2184-1 Dimensions selon DIN 2184-1 Dimensioni sec. DIN 2184-1 |
| UNJF | UNJF-Gewinde ANSI-B 1.1 UNJF thread ANSI-B 1.1 Filetage UNJF ANSI-B 1.1 UNJF-passo fine ANSI-B 1.1 | 6GX | Toleranzklasse 6GX Tolerance class 6GX Classe de tolérance 6GX Tolleranza 6GX | DIN 2184-2 | Baumaße nach DIN 2184-2 Dimensions acc. DIN 2184-2 Dimensions selon DIN 2184-2 Dimensioni sec. DIN 2184-2 |
| UN-8 | UN-8-Gewinde ANSI-B 1.1 UN-8 thread ANSI-B 1.1 Filetage UN-8 ANSI-B 1.1 UN-8 sec. ANSI-B 1.1 | 7GX | Toleranzklasse 7GX Tolerance class 7GX Classe de tolérance 7GX Tolleranza 7GX | DIN 2189 | Baumaße nach DIN 2189 Dimensions acc. DIN 2189 Dimensions selon DIN 2189 Dimensioni sec. DIN 2189 |
| PG | Stahlplanzerrohr-Gewinde DIN 40430 Steel conduit thread DIN 40430 Filetage pour tubes électriques DIN 40430 Filettatura per tubi elettrici DIN 40430 | 2BX | Toleranzklasse 2BX Tolerance class 2BX Classe de tolérance 2BX Tolleranza 2BX | DIN 5156 | Baumaße nach DIN 5156 Dimensions acc. DIN 5156 Dimensions selon DIN 5156 Dimensioni sec. DIN 5156 |
| NPT | Amerikanisches kegeliges Rohrgewinde ANSI-B 1.1 American tapered pipe thread ANSI-B 1.1 Filetage pas du gaz conique américain ANSI-B 1.1 Filettatura americana conica secondo ANSI-B1.1 | 7G | Toleranzklasse 7G Tolerance class 7G Classe de tolérance 7G Tolleranza 7G | DIN 5157 | Baumaße nach DIN 5157 Dimensions acc. DIN 5157 Dimensions selon DIN 5157 Dimensioni sec. DIN 5157 |
| GH53 | Für gehärtete Werkstoffe von 42 – 53 HRC For high hardened materials from 42 – 53 HRC Pour matériaux trempés de 42 – 53 HRC Per materiali temprati da 42 – 53 HRC | 6g | Toleranzklasse 6g Tolerance class 6g Classe de tolérance 6g Tolleranza 6g | DIN 40432 | Baumaße nach DIN 40432 Dimensions acc. DIN 40432 Dimensions selon DIN 40432 Dimensioni sec. DIN 40432 |
| GH63 | Für gehärtete Werkstoffe von 50 – 63 HRC For high hardened materials from 50 – 63 HRC Pour matériaux trempés de 50 – 63 HRC Per materiali temprati da 50 – 63 HRC | 2A | Toleranzklasse 2A Tolerance class 2A Classe de tolérance 2A Tolleranza 2A | DIN 40435 | Baumaße nach DIN 40435 Dimensions acc. DIN 40435 Dimensions selon DIN 40435 Dimensioni sec. DIN 40435 |
| AG | Abgesetztes Gewinde Back tapered thread part Troncature arrière Rastremazione posteriore | 2B | Toleranzklasse 2B Tolerance class 2B Classe de tolérance 2B Tolleranza 2B | EN 22568 | Baumaße nach EN 22568 Dimensions acc. EN 22568 Dimensions selon EN 22568 Dimensioni sec. EN 22568 |
| AZ | Ausgesetzte Zähne Interrupted thread Filets alternés Con denti alternati | 3B | Toleranzklasse 3B Tolerance class 3B Classe de tolérance 3B Tolleranza 3B | EN 24231 | Baumaße nach EN 24231 Dimensions acc. EN 24231 Dimensions selon EN 24231 Dimensioni sec. EN 24231 |

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|---|---|---|--|---|--|
|  | Flankenwinkel 55° Flank angle 55° Angle de flanc 55° Profilo a 55° |  | Anschnittform B, 3,5 – 5 Gewindegänge Chamfer form B, 3,5 – 5 threads Forme d'entrée B, 3,5 – 5 filets Imbocco forma B, 3,5 – 5 filetti |  | Für Durchgangsgewinde For through hole threads Pour trous débouchants Per fori passanti |
|  | Flankenwinkel 60° Flank angle 60° Angle de flanc 60° Profilo a 60° |  | Anschnittform C, 2 – 3 Gewindegänge Chamfer form C, 2 – 3 threads Forme d'entrée C, 2 – 3 filets Imbocco forma C, 2 – 3 filetti |  | Für Grundlochgewinde ≤1,5xD For blind hole threads ≤1,5xD Pour trous borgnes ≤1,5xD Per fori ciechi ≤1,5xD |
|  | Flankenwinkel 80° Flank angle 80° Angle de flanc 80° Profilo a 80° |  | Anschnittform D, 3,5 – 5 Gewindegänge Chamfer form D, 3,5 – 5 threads Forme d'entrée D, 3,5 – 5 filets Imbocco forma D, 3,5 – 5 filetti |  | Für Grundlochgewinde ≤2,5xD For blind hole threads ≤2,5xD Pour trous borgnes ≤2,5xD Per fori ciechi ≤2,5xD |
|  | Metrisches ISO-Regelgewinde DIN 13 ISO Metric coarse thread DIN 13 Filetage métrique ISO DIN 13 Metrica ISO-passo grosso DIN 13 |  | Anschnittform E, 1,5 – 2 Gewindegänge Chamfer form E, 1,5 – 2 threads Forme d'entrée E, 1,5 – 2 filets Imbocco forma E, 1,5 – 2 filetti |  | Für Grundlochgewinde ≤3xD For blind hole threads ≤3xD Pour trous borgnes ≤3xD Per fori ciechi ≤3xD |
|  | Metrisches Einsatz-Gewinde für Gewindeeinsätze aus Draht Metric insert thread for wire inserts Filetage métrique pour inserts Metrica – per filetti riportati |  | Drallwinkel 10° Helix angle 10° Angle d'hélice 10° Elica a 10° |  | Senkfase 45° Countersink 45° Chanfrein 45° Svasatura 45° |
|  | Rohrgewinde nach DIN ISO 228 Pipe threads according to DIN ISO 228 Filetage pour tubes de Gaz selon DIN ISO 228 Filettatura Gas secondo DIN ISO 228 |  | Drallwinkel 15° Helix angle 15° Angle d'hélice 15° Elica a 15° |  | Schaftausführung nach DIN 6535 HB (Weldon) Shank design according to DIN 6535 HB (Weldon) Queue selon DIN 6535 HB (Weldon) Gambo secondo DIN 6535 HB (Weldon) |
|  | MJ-Gewinde nach DIN ISO 5855 MJ-Thread according to DIN ISO 5855 Filetage MJ selon DIN ISO 5855 Filettatura MJ secondo DIN ISO 5855 |  | Drallwinkel 15° Linksspirale Helix angle 15° left hand helix Angle d'hélice 15° à gauche Elica a 15° sinistra |  | Nur für Synchronbearbeitung Only for rigid tapping Uniquement pour le taraudage rigide Solo per maschiatura rigida |
|  | Unified-Gewinde nach ANSI-B 1.1 Unified threads according to ANSI-B 1.1 Filetage pas américains selon ANSI-B 1.1 Filettatura Unified secondo ANSI-B 1.1 |  | Drallwinkel 20° Linksspirale Helix angle 20° left hand helix Angle d'hélice 20° à gauche Elica a 20° sinistra |  | Seite Page Page Pagina |
|  | Unified-Gewinde nach ANSI-B 1.15 Unified thread according to ANSI-B 1.15 Filetage pas américains selon ANSI-B 1.15 Filettatura unificata secondo ANSI-B 1.15 |  | Drallwinkel 40° Helix angle 40° Angle d'hélice 40° Elica a 40° |  | Code Artikel-Nummer Order number Numéro d'article Numero di articolo |
|  | Amerikanisches kegeliges Rohrgewinde – Kegel 1:16 American tapered pipe thread – taper 1:16 Filetage pour tubes de Gaz – cône 1:16 Filettatura Americana conica per tubi – conicità 1:16 |  | Drallwinkel 40° Linksspirale Helix angle 40° left hand helix Angle d'hélice 40° à gauche Elica a 40° sinistra |  | W% Warengruppe Product group Group d'article Gruppo merceologico |
|  | Stahlpanzerrohr-Gewinde nach DIN 40430 Steel conduit thread according to DIN 40430 Filetage pour tubes électriques selon DIN 40430 Filettatura per tubi elettrici DIN 40430 |  | Drallwinkel 45° Helix angle 45° Angle d'hélice 45° Elica a 45° | | |
|  | Anschnittform A, 6 – 8 Gewindegänge Chamfer form A, 6 – 8 threads Forme d'entrée A, 6 – 8 filets Imbocco forma A, 6 – 8 filetti |  | Drallwinkel 50° Helix angle 50° Angle d'hélice 50° Elica a 50° | | |

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|------------------|---|---|--|---|---|
| Typ N |  Schlichtfräsen Finishing Finissage Frese a finire | DIN 844 | Baumaße nach DIN 844 Dimensions acc. DIN 844 Dimensions selon DIN 844 Dimensioni sec. DIN 844 | d₁= e8 | Schneidentoleranz nach Toleranzklasse e8 Cutting diameter acc. to tolerance class e8 Diamètre de coupe selon classe de tolérance e8 Diametro di taglio secondo tolleranza e8 |
| Typ VA |   Schrumpfräsen Roughing Ebauchage Frese a sgrossare | kurz short courte corte | Kurze Ausführung Short execution Exécution courte Esecuzione corta | d₁= js14 | Schneidentoleranz nach Toleranzklasse js14 Cutting diameter acc. to tolerance class js14 Diamètre de coupe selon classe de tolérance js14 Diametro di taglio secondo tolleranza js14 |
| Typ NF |  Schrupp-Schlichtfräsen Roughing-Finishing Semi-Finissage Frese a sgrossare-finire | lang long longue lunghe | Lange Ausführung Long execution Exécution longue Esecuzione lunghe | d₁= k9 | Schneidentoleranz nach Toleranzklasse k9 Cutting diameter acc. to tolerance class k9 Diamètre de coupe selon classe de tolérance k9 Diametro di taglio secondo tolleranza k9 |
| Typ HR |  Schrumpfräsen Roughing Ebauchage Frese a sgrossare |  Drallwinkel 55° Helix angle 55° Angle d'hélice 55° Elica a 55° | | d₁= k10 | Schneidentoleranz nach Toleranzklasse k10 Cutting diameter acc. to tolerance class k10 Diamètre de coupe selon classe de tolérance k10 Diametro di taglio secondo tolleranza k10 |
| Typ HRS |  Schrupp-Schlichtfräsen Roughing-Finishing Semi-Finissage Frese a sgrossare-finire |  Anzahl der Schneiden (z = 2) Number of flutes (z = 2) Nombre de dents (z = 2) Numero dei taglienti (z = 2) | |  | Nutenfräsen Slotting Rainurage Cave |
| Typ NR |  Schrumpfräsen Roughing Ebauchage Frese a sgrossare |  Anzahl der Schneiden (z = 3) Number of flutes (z = 3) Nombre de dents (z = 3) Numero dei taglienti (z = 3) | |  | Seitenfräsen Side milling Contournage Contornatura |
| Typ W/45° |  Für weiche, langspannende Werkstoffe For mild and long chipping materials Pour matériaux doux et à copeaux longs Per materiali dolci (truciolo lungo) |  Anzahl der Schneiden (z = 4) Number of flutes (z = 4) Nombre de dents (z = 4) Numero dei taglienti (z = 4) | | | |
| DIN 327 | Baumaße nach DIN 327 Dimensions acc. DIN 327 Dimensions selon DIN 327 Dimensioni sec. DIN 327 |  Anzahl der Schneiden (z = 5 / 6 / 8) Number of flutes (z = 5 / 6 / 8) Nombre de dents (z = 5 / 6 / 8) Numero dei taglienti (z = 5 / 6 / 8) | | | |

| | | | | | |
|------------------|--|---|--|---|---|
| Typ SH53 | Für gehärtete Werkstoffe ≤ 53 HRC For high hardened materials ≤ 53 HRC Pour matériaux trempés ≤ 53 HRC Per materiali temprati fino ≤ 53 HRC |  ≤3xD | Für Bohrtiefe ≤3xD For depth of hole ≤3xD Pour profondeur de perçage ≤3xD Per profondità di foratura ≤3xD |  ≤40xD | Für Bohrtiefe ≤40xD For depth of hole ≤40xD Pour profondeur de perçage ≤40xD Per profondità di foratura ≤40xD |
| Typ SH60 | Für gehärtete Werkstoffe von 50 – 60 HRC For high hardened materials from 50 – 60 HRC Pour matériaux trempés de 50 – 60 HRC Per materiali temprati da 50 – 60 HRC |  ≤5xD | Für Bohrtiefe ≤5xD For depth of hole ≤5xD Pour profondeur de perçage ≤5xD Per profondità di foratura ≤5xD |  ≤50xD | Für Bohrtiefe ≤50xD For depth of hole ≤50xD Pour profondeur de perçage ≤50xD Per profondità di foratura ≤50xD |
| Typ SH60+ | Für gehärtete Werkstoffe ≤ 65 HRC For high hardened materials ≤ 65 HRC Pour matériaux trempés ≤ 65 HRC Per materiali temprati fino ≤ 65 HRC |  ≤8xD | Für Bohrtiefe ≤8xD For depth of hole ≤8xD Pour profondeur de perçage ≤8xD Per profondità di foratura ≤8xD | DIN 6535-HA  | Schaftausführung nach DIN 6535 HA Shank design according to DIN 6535 HA Queue selon DIN 6535 HA Gambo secondo DIN 6535 HA |
| Typ SH70 | Für gehärtete Werkstoffe von 50 – 70 HRC For high hardened materials from 50 – 70 HRC Pour matériaux trempés de 50 – 70 HRC Per materiali temprati da 50 – 70 HRC |  ≤10xD | Für Bohrtiefe ≤10xD For depth of hole ≤10xD Pour profondeur de perçage ≤10xD Per profondità di foratura ≤10xD | DIN 6535-HA DIN 6535-HB DIN 6535-HE  | Schaftausführung nach DIN 6535 Shank design according to DIN 6535 Queue selon DIN 6535 Gambo secondo DIN 6535 |
| Typ SUK | Pulverstahl-Spiralbohrer für den universellen Einsatz ≤3xD Powder steel drill for universal use ≤3xD Forets en acier fritté pour utilisation universelle ≤3xD Punte in acciaio sinterizzato per uso universale ≤3xD |  ≤12xD | Für Bohrtiefe ≤12xD For depth of hole ≤12xD Pour profondeur de perçage ≤12xD Per profondità di foratura ≤12xD | d₁= h7 | Schneidentoleranz nach Toleranzklasse h7 Cutting diameter acc. to tolerance class h7 Diamètre de coupe selon classe de tolérance h7 Diametro di taglio secondo tolleranza h7 |
| Typ SUL | Pulverstahl-Spiralbohrer für den universellen Einsatz ≤5xD Powder steel drill for universal use ≤5xD Forets en acier fritté pour utilisation universelle ≤5xD Punte in acciaio sinterizzato per uso universale ≤5xD |  ≤15xD | Für Bohrtiefe ≤15xD For depth of hole ≤15xD Pour profondeur de perçage ≤15xD Per profondità di foratura ≤15xD | d₁= h8 | Schneidentoleranz nach Toleranzklasse h8 Cutting diameter acc. to tolerance class h8 Diamètre de coupe selon classe de tolérance h8 Diametro di taglio secondo tolleranza h8 |
| DIN 6537K | Baumaße nach DIN 6537 K Dimensions acc. DIN 6537 K Dimensions selon DIN 6537 K Dimensioni sec. DIN 6537 K |  ≤20xD | Für Bohrtiefe ≤20xD For depth of hole ≤20xD Pour profondeur de perçage ≤20xD Per profondità di foratura ≤20xD | d₂= h7 | Schaft nach Toleranzklasse h7 Shank acc. to tolerance class h7 Queue selon classe de tolérance h7 Gambo secondo tolleranza h7 |
| DIN 6537L | Baumaße nach DIN 6537 L Dimensions acc. DIN 6537 L Dimensions selon DIN 6537 L Dimensioni sec. DIN 6537 L |  ≤30xD | Für Bohrtiefe ≤30xD For depth of hole ≤30xD Pour profondeur de perçage ≤30xD Per profondità di foratura ≤30xD | | |

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| 371 170 | 74 | 376 100 | 70 | 444 880 | 298 | 576 143 | 152 | 957 150 | 86 |
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| 371 241 | 116 | 376 143 | 93 | 528 010 | 248-249 | 576 347 | 154 | 980 100 | 127 |
| 371 300 | 79 | 376 150 | 78 | 528 015 | 250 | 576 381 | 158 | 980 103 | 129 |
| 371 303 | 100 | 376 151 | 75 | 528 020 | 251 | 576 387 | 160 | 980 150 | 128 |
| 371 305 | 109 | 376 153 | 98 | 529 000 | 230-238 | 576 403 | 139 | 980 200 | 127 |
| 371 306 | 83 | 376 163 | 94 | 529 100 | 239-245 | 576 437 | 140 | 980 201 | 130 |
| 371 307 | 69 | 376 164 | 95 | 529 500 | 253-254 | 576 463 | 141 | 980 300 | 128 |
| 371 308 | 82 | 376 170 | 74 | 529 700 | 255-256 | 576 603 | 146 | 980 303 | 129 |
| 371 313 | 101 | 376 190 | 71 | 530 403 | 151 | 576 703 | 142 | 980 504 | 203 |
| 371 320 | 80 | 376 193 | 92 | 530 703 | 151 | 576 723 | 144 | 980 891 | 210 |
| 371 323 | 102 | 376 200 | 76 | 533 119 | 172 | 576 737 | 143 | 990 050 | 178+179 |



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