



Leading Through Innovation



**HSS-PM**



**YG TAP Ti Ni**

**YG Gewindebohrer Titan /  
Superlegierungen**

- For Heat Resistent Super Alloys and Titanium Alloys Applied with Cutting Edge Rake Angles and Thread Relief
- Für hitzebeständige Superlegierungen und Titanlegierungen, mit Schneidkanten-Spanwinkeln und Gewindehinterschliff

SELECTION GUIDE



HSS-PM  
YG TAP  
Ti Ni

For Heat Resistent Super Alloys and Titanium Alloys  
Applied with Cutting Edge Rake Angles and Thread Relief



Please visit  
[globalyg1.com/mat](http://globalyg1.com/mat)  
for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.B234

| ISO | VDI 3323 | Material Description               | Composition / Structure / Heat Treatment       |                     | HB      | HRc |   |   |   |   |
|-----|----------|------------------------------------|------------------------------------------------|---------------------|---------|-----|---|---|---|---|
| P   | 1        | Non-alloy steel                    | About 0.15% C                                  | Annealed            | 125     |     |   |   |   |   |
|     | 2        |                                    | About 0.45% C                                  | Annealed            | 190     |     |   |   |   |   |
|     | 3        |                                    | About 0.45% C                                  | Quenched & Tempered | 250     |     |   |   |   |   |
|     | 4        |                                    | About 0.75% C                                  | Annealed            | 270     |     |   |   |   |   |
|     | 5        |                                    | About 0.75% C                                  | Quenched & Tempered | 300     |     |   |   |   |   |
|     | 6        | Low alloy steel                    |                                                | Annealed            | 180     |     |   |   |   |   |
|     | 7        |                                    |                                                | Quenched & Tempered | 275     |     | ○ | ○ | ○ | ○ |
|     | 8        |                                    |                                                | Quenched & Tempered | 300     |     | ○ | ○ | ○ | ○ |
|     | 9        |                                    |                                                | Quenched & Tempered | 350     |     | ○ | ○ | ○ | ○ |
|     | 10       | High alloyed steel, and tool steel |                                                | Annealed            | 200     |     |   |   |   |   |
|     | 11       |                                    |                                                | Quenched & Tempered | 325     |     |   |   |   |   |
| M   | 12       | Stainless steel                    | Ferritic / Martensitic                         | Annealed            | 200     |     |   |   |   |   |
|     | 13       |                                    | Martensitic                                    | Quenched & Tempered | 240     |     |   |   |   |   |
|     | 14       |                                    | Austenitic                                     |                     | 180     |     |   |   |   |   |
| K   | 15       | Grey cast iron                     | Pearlitic / ferritic                           |                     | 180     |     |   |   |   |   |
|     | 16       |                                    | Pearlitic (Martensitic)                        |                     | 260     |     |   |   |   |   |
|     | 17       | Nodular cast iron                  | Ferritic                                       |                     | 160     |     |   |   |   |   |
|     | 18       |                                    | Pearlitic                                      |                     | 250     |     |   |   |   |   |
|     | 19       | Malleable cast iron                | Ferritic                                       |                     | 130     |     |   |   |   |   |
|     | 20       |                                    | Pearlitic                                      |                     | 230     |     |   |   |   |   |
| N   | 21       | Aluminum-wrought alloy             | Not Curable                                    |                     | 60      |     |   |   |   |   |
|     | 22       |                                    | Curable                                        | Hardened            | 100     |     |   |   |   |   |
|     | 23       | Aluminum-cast, alloyed             | ≤ 12% Si, Not Curable                          |                     | 75      |     |   |   |   |   |
|     | 24       |                                    | ≤ 12% Si, Curable                              | Hardened            | 90      |     |   |   |   |   |
|     | 25       |                                    | > 12% Si, Not Curable                          |                     | 130     |     |   |   |   |   |
|     | 26       | Copper and Copper Alloys           | Cutting Alloys, PB>1%                          |                     | 110     |     |   |   |   |   |
|     | 27       |                                    | CuZn, CuSnZn (Brass)                           |                     | 90      |     |   |   |   |   |
|     | 28       | Non Metallic Materials             | CuSn, lead-free copper and electrolytic copper |                     | 100     |     |   |   |   |   |
|     | 29       |                                    | Duroplastic, Fiber Reinforced Plastic          |                     |         |     |   |   |   |   |
|     | 30       |                                    | Rubber, Wood, etc.                             |                     |         |     |   |   |   |   |
| S   | 31       | Heat Resistant Super Alloys        | Fe Based                                       | Annealed            | 200     |     | ○ | ○ | ○ | ○ |
|     | 32       |                                    |                                                | Cured               | 280     |     |   |   | ○ | ○ |
|     | 33       |                                    |                                                | Annealed            | 250     |     |   |   | ○ | ○ |
|     | 34       |                                    | Ni or Co Based                                 | Cured               | 350     |     |   |   | ○ | ○ |
|     | 35       |                                    |                                                | Cast                | 320     |     |   |   | ○ | ○ |
|     | 36       | Titanium Alloys                    | Pure Titanium                                  |                     | 400 Rm  |     | ○ | ○ | ○ | ○ |
|     | 37       |                                    | Alpha + Beta Alloys                            | Hardened            | 1050 Rm |     | ◎ | ◎ | ◎ | ◎ |
| H   | 38       | Hardened steel                     |                                                | Hardened            | 550     |     |   |   |   |   |
|     | 39       |                                    |                                                | Hardened            | 630     |     |   |   |   |   |
|     | 40       | Chilled Cast Iron                  |                                                | Cast                | 400     |     |   |   | ○ | ○ |
|     | 41       | Hardened Cast Iron                 |                                                | Hardened            | 550     |     |   |   |   |   |

|                                                                                     | Max. 2.5xD Blind Hole                                                               | Max. 3.0xD Through Hole                                                             | Max. 2.5xD Blind Hole                                                               | Max. 3.0xD Through Hole                                                             | Max. 2.5xD Blind Hole                                                               | Max. 3.0xD Through Hole                                                             | Max. 2.5xD Blind Hole                                                               | Max. 3.0xD Through Hole |        |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------|--------|
| HSS-PM                                                                              |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         |        |
| C                                                                                   | C                                                                                   | B                                                                                   | B                                                                                   | C                                                                                   | C                                                                                   | B                                                                                   | B                                                                                   |                         |        |
| Spiral Flute                                                                        | Spiral Flute                                                                        | Spiral Point                                                                        | Spiral Point                                                                        | Spiral Flute                                                                        | Spiral Flute                                                                        | Spiral Point                                                                        | Spiral Point                                                                        |                         |        |
| R40                                                                                 | R40                                                                                 | -                                                                                   | -                                                                                   | R40                                                                                 | R40                                                                                 | -                                                                                   | -                                                                                   |                         |        |
| TM933 (p.B226)                                                                      | TZ933 (p.B227)                                                                      | TM923 (p.B228)                                                                      | TZ923 (p.B229)                                                                      | TQ833 (p.B230)                                                                      | TR833 (p.B231)                                                                      | TQ873 (p.B232)                                                                      | TR873 (p.B233)                                                                      |                         |        |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | M      |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | MF     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | UNC    |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | UNF    |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | BSW    |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | G(BSP) |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | EG-M   |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | EG-UNC |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | EG-UNF |
| Bright                                                                              | TiAlN                                                                               | Bright                                                                              | TiAlN                                                                               | VAP                                                                                 | Bright                                                                              | VAP                                                                                 | Bright                                                                              |                         |        |
|  |  |  |  |  |  |  |  |                         |        |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 1      |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 2      |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 3      |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 4      |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 5      |
| ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   |                         | 6 P    |
| ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   |                         | 7      |
| ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   |                         | 8      |
| ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   |                         | 9      |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 10     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 11     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 12     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 13 M   |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 14     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 15     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 16     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 17 K   |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 18     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 19     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 20     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 21     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 22     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 23     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 24     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 25     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 26 N   |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 27     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 28     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 29     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 30     |
| ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   |                         | 31     |
| ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   |                         | 32     |
| ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   |                         | 33     |
| ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   |                         | 34 S   |
| ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   |                         | 35     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     | ○                                                                                   | ○                                                                                   | ○                                                                                   | ○                                                                                   |                         | 36     |
| ○                                                                                   | ○                                                                                   | ○                                                                                   | ○                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   | ◎                                                                                   |                         | 37     |
|                                                                                     |                                                                                     |                                                                                     | ○                                                                                   |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 38     |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 39     |
|                                                                                     |                                                                                     | ○                                                                                   | ○                                                                                   |                                                                                     |                                                                                     | ○                                                                                   | ○                                                                                   |                         | 40 H   |
|                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                         | 41     |

CARBIDE

HSS

YG TAP Ti Ni

TM903 SERIES

M

ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13

ISO MÉTRIQUE DIN13

ISO Metrico passo grosso DIN 13

Machine taps  
Maschinengewindebohrer

Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

DIN 371

DIN 376

Hole type

2.5×D

60°

P

L1

L2

L3

ØD2

ØD1

KI

L1

L2

L3

60°

P

Ød1

Ti

HSS PM

DIN 371/376

6H

60°

C

R25

Bright

p.B234

Plain Shank

TAPPING ER CHUCK

TAPPING CHUCK

ONE STEP TAPPING CHUCK

Unit : mm

| SIZE  | Pitch  | EDP No.  | Thread Length | Overall Length | Neck Length | Shank Diameter | Square Size | Square Length | No. of Flute | Tapping Drill Diameter |
|-------|--------|----------|---------------|----------------|-------------|----------------|-------------|---------------|--------------|------------------------|
| ØD1   | P      | Bright   | L1            | L2             | L3          | ØD2            | K           | KI            | Z            | Ød1                    |
| M2    | × 0.4  | TM903136 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.6                    |
| M2.2  | × 0.45 | TM903156 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.75                   |
| *M2.3 | × 0.4  | TM903196 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.9                    |
| M2.5  | × 0.45 | TM903176 | 9             | 50             | 15          | 2.8            | 2.1         | 5             | 3            | 2.05                   |
| *M2.6 | × 0.45 | TM903496 | 9             | 50             | 15          | 2.8            | 2.1         | 5             | 3            | 2.1                    |
| M3    | × 0.5  | TM903206 | 6             | 56             | 18          | 3.5            | 2.7         | 6             | 3            | 2.5                    |
| M3.5  | × 0.6  | TM903226 | 7             | 56             | 20          | 4              | 3           | 6             | 3            | 2.9                    |
| M4    | × 0.7  | TM903246 | 7             | 63             | 21          | 4.5            | 3.4         | 6             | 3            | 3.3                    |
| M4.5  | × 0.75 | TM903266 | 8             | 70             | 25          | 6              | 4.9         | 8             | 3            | 3.7                    |
| M5    | × 0.8  | TM903286 | 8             | 70             | 25          | 6              | 4.9         | 8             | 3            | 4.2                    |
| M6    | × 1.0  | TM903316 | 10            | 80             | 30          | 6              | 4.9         | 8             | 3            | 5                      |
| M7    | × 1.0  | TM903346 | 10            | 80             | 30          | 7              | 5.5         | 8             | 3            | 6                      |
| M8    | × 1.25 | TM903366 | 13            | 90             | 35          | 8              | 6.2         | 9             | 3            | 6.8                    |
| M9    | × 1.25 | TM903396 | 13            | 90             | 35          | 9              | 7           | 10            | 3            | 7.8                    |
| M10   | × 1.5  | TM903426 | 15            | 100            | 39          | 10             | 8           | 11            | 3            | 8.5                    |
| M11   | × 1.5  | TM903466 | 17            | 100            | 40          | 8              | 6.2         | 9             | 3            | 9.5                    |
| M12   | × 1.75 | TM903506 | 18            | 110            | 44          | 9              | 7           | 10            | 3            | 10.2                   |
| M14   | × 2.0  | TM903546 | 20            | 110            | 44          | 11             | 9           | 12            | 3            | 12                     |
| M16   | × 2.0  | TM903606 | 20            | 110            | 44          | 12             | 9           | 12            | 3            | 14                     |
| M18   | × 2.5  | TM903656 | 25            | 125            | 50          | 14             | 11          | 14            | 4            | 15.5                   |
| M20   | × 2.5  | TM903706 | 25            | 140            | 54          | 16             | 12          | 15            | 4            | 17.5                   |
| M22   | × 2.5  | TM903746 | 25            | 140            | 54          | 18             | 14.5        | 17            | 4            | 19.5                   |
| M24   | × 3.0  | TM903786 | 30            | 160            | 60          | 18             | 14.5        | 17            | 4            | 21                     |
| M27   | × 3.0  | TM903866 | 30            | 160            | 60          | 20             | 16          | 19            | 4            | 24                     |
| M30   | × 3.5  | TM903946 | 35            | 180            | 70          | 22             | 18          | 21            | 4            | 26.5                   |

DIN 371(M2~M10) and DIN 376(M11~M30)

\* DIN profile not ISO

◎ : Excellent ○ : Good

| ISO                  | P                      |     |     |     |     |                        |     |     |     |     | M                                         |     |     |     |     | K                      |        |     |     |     |     |
|----------------------|------------------------|-----|-----|-----|-----|------------------------|-----|-----|-----|-----|-------------------------------------------|-----|-----|-----|-----|------------------------|--------|-----|-----|-----|-----|
| Material Description | Non-alloy steel        |     |     |     |     | Low alloy steel        |     |     |     |     | High alloyed steel, and tool steel        |     |     |     |     | Stainless steel        |        |     |     |     |     |
| VDI 3323             | 1                      | 2   | 3   | 4   | 5   | 6                      | 7   | 8   | 9   | 10  | 11                                        | 12  | 13  | 14  | 15  | 16                     | 17     | 18  | 19  | 20  |     |
| HRC                  | 125                    | 13  | 25  | 28  | 32  | 10                     | 29  | 32  | 38  | 15  | 35                                        | 15  | 23  | 10  | 10  | 26                     | 3      | 25  | 21  | 21  |     |
| HB                   | 125                    | 190 | 250 | 270 | 300 | 180                    | 275 | 300 | 350 | 200 | 325                                       | 200 | 240 | 180 | 180 | 260                    | 160    | 250 | 130 | 230 |     |
| Recommended          |                        |     |     |     |     |                        | ○   | ○   | ○   |     |                                           |     |     |     |     |                        |        |     |     |     |     |
| ISO                  | N                      |     |     |     |     |                        |     |     |     |     | S                                         |     |     |     |     | H                      |        |     |     |     |     |
| Material Description | Aluminum-wrought alloy |     |     |     |     | Aluminum-cast, alloyed |     |     |     |     | Copper and Copper Alloys (Bronze / Brass) |     |     |     |     | Non Metallic Materials |        |     |     |     |     |
| VDI 3323             | 21                     | 22  | 23  | 24  | 25  | 26                     | 27  | 28  | 29  | 30  | 31                                        | 32  | 33  | 34  | 35  | 36                     | 37     | 38  | 39  | 40  | 41  |
| HRC                  | 60                     | 100 | 75  | 90  | 130 | 110                    | 90  | 100 |     |     | 15                                        | 30  | 25  | 38  | 34  | 55                     | 60     | 42  | 55  | 55  |     |
| HB                   | 60                     | 100 | 75  | 90  | 130 | 110                    | 90  | 100 |     |     | 200                                       | 280 | 250 | 350 | 320 | 400Rm                  | 1050Rm | 550 | 630 | 400 | 550 |
| Recommended          |                        |     |     |     |     |                        |     |     |     |     |                                           | ○   |     |     |     | ○                      | ◎      |     |     |     |     |

CARBIDE

HSS

YG TAP Ti Ni

TZ903 SERIES

M

ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13

ISO MÉTRIQUE DIN13

ISO Metrico passo grosso DIN 13

Machine taps  
Maschinengewindebohrer

Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

DIN 371

DIN 376

Hole type

2.5×D

60°

P

L1

L2

L3

ØD2

ØD1

KI

L1

L2

L3

60°

P

Ød1

Ti

HSS PM

DIN 371/376

6H

60°

C

R25

TiAlN

p.B234

Plain Shank

TAPPING ER CHUCK

TAPPING CHUCK

ONE STEP TAPPING CHUCK

Unit : mm

| SIZE  | Pitch  | EDP No.  | Thread Length | Overall Length | Neck Length | Shank Diameter | Square Size | Square Length | No. of Flute | Tapping Drill Diameter |
|-------|--------|----------|---------------|----------------|-------------|----------------|-------------|---------------|--------------|------------------------|
| ØD1   | P      | TiAlN    | L1            | L2             | L3          | ØD2            | K           | KI            | Z            | Ød1                    |
| M2    | × 0.4  | TZ903136 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.6                    |
| M2.2  | × 0.45 | TZ903156 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.75                   |
| *M2.3 | × 0.4  | TZ903196 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.9                    |
| M2.5  | × 0.45 | TZ903176 | 9             | 50             | 15          | 2.8            | 2.1         | 5             | 3            | 2.05                   |
| *M2.6 | × 0.45 | TZ903496 | 9             | 50             | 15          | 2.8            | 2.1         | 5             | 3            | 2.1                    |
| M3    | × 0.5  | TZ903206 | 6             | 56             | 18          | 3.5            | 2.7         | 6             | 3            | 2.5                    |
| M3.5  | × 0.6  | TZ903226 | 7             | 56             | 20          | 4              | 3           | 6             | 3            | 2.9                    |
| M4    | × 0.7  | TZ903246 | 7             | 63             | 21          | 4.5            | 3.4         | 6             | 3            | 3.3                    |
| M4.5  | × 0.75 | TZ903266 | 8             | 70             | 25          | 6              | 4.9         | 8             | 3            | 3.7                    |
| M5    | × 0.8  | TZ903286 | 8             | 70             | 25          | 6              | 4.9         | 8             | 3            | 4.2                    |
| M6    | × 1.0  | TZ903316 | 10            | 80             | 30          | 6              | 4.9         | 8             | 3            | 5                      |
| M7    | × 1.0  | TZ903346 | 10            | 80             | 30          | 7              | 5.5         | 8             | 3            | 6                      |
| M8    | × 1.25 | TZ903366 | 13            | 90             | 35          | 8              | 6.2         | 9             | 3            | 6.8                    |
| M9    | × 1.25 | TZ903396 | 13            | 90             | 35          | 9              | 7           | 10            | 3            | 7.8                    |
| M10   | × 1.5  | TZ903426 | 15            | 100            | 39          | 10             | 8           | 11            | 3            | 8.5                    |
| M11   | × 1.5  | TZ903466 | 17            | 100            | 40          | 8              | 6.2         | 9             | 3            | 9.5                    |
| M12   | × 1.75 | TZ903506 | 18            | 110            | 44          | 9              | 7           | 10            | 3            | 10.2                   |
| M14   | × 2.0  | TZ903546 | 20            | 110            | 44          | 11             | 9           | 12            | 3            | 12                     |
| M16   | × 2.0  | TZ903606 | 20            | 110            | 44          | 12             | 9           | 12            | 3            | 14                     |
| M18   | × 2.5  | TZ903656 | 25            | 125            | 50          | 14             | 11          | 14            | 4            | 15.5                   |
| M20   | × 2.5  | TZ903706 | 25            | 140            | 54          | 16             | 12          | 15            | 4            | 17.5                   |
| M22   | × 2.5  | TZ903746 | 25            | 140            | 54          | 18             | 14.5        | 17            | 4            | 19.5                   |
| M24   | × 3.0  | TZ903786 | 30            | 160            | 60          | 18             | 14.5        | 17            | 4            | 21                     |
| M27   | × 3.0  | TZ903866 | 30            | 160            | 60          | 20             | 16          | 19            | 4            | 24                     |
| M30   | × 3.5  | TZ903946 | 35            | 180            | 70          | 22             | 18          | 21            | 4            | 26.5                   |

DIN 371(M2~M10) and DIN 376(M11~M30)

\* DIN profile not ISO

◎ : Excellent ○ : Good

| ISO                  | P                      |     |     |     |     |                        |     |     |     |     | M                                         |     |     |     |     | K                      |        |     |     |     |     |
|----------------------|------------------------|-----|-----|-----|-----|------------------------|-----|-----|-----|-----|-------------------------------------------|-----|-----|-----|-----|------------------------|--------|-----|-----|-----|-----|
| Material Description | Non-alloy steel        |     |     |     |     | Low alloy steel        |     |     |     |     | High alloyed steel, and tool steel        |     |     |     |     | Stainless steel        |        |     |     |     |     |
| VDI 3323             | 1                      | 2   | 3   | 4   | 5   | 6                      | 7   | 8   | 9   | 10  | 11                                        | 12  | 13  | 14  | 15  | 16                     | 17     | 18  | 19  | 20  |     |
| HRC                  | 125                    | 13  | 25  | 28  | 32  | 10                     | 29  | 32  | 38  | 15  | 35                                        | 15  | 23  | 10  | 10  | 26                     | 3      | 25  | 21  | 21  |     |
| HB                   | 125                    | 190 | 250 | 270 | 300 | 180                    | 275 | 300 | 350 | 200 | 325                                       | 200 | 240 | 180 | 180 | 260                    | 160    | 250 | 130 | 230 |     |
| Recommended          |                        |     |     |     |     |                        | ○   | ○   | ○   |     |                                           |     |     |     |     |                        |        |     |     |     |     |
| ISO                  | N                      |     |     |     |     |                        |     |     |     |     | S                                         |     |     |     |     | H                      |        |     |     |     |     |
| Material Description | Aluminum-wrought alloy |     |     |     |     | Aluminum-cast, alloyed |     |     |     |     | Copper and Copper Alloys (Bronze / Brass) |     |     |     |     | Non Metallic Materials |        |     |     |     |     |
| VDI 3323             | 21                     | 22  | 23  | 24  | 25  | 26                     | 27  | 28  | 29  | 30  | 31                                        | 32  | 33  | 34  | 35  | 36                     | 37     | 38  | 39  | 40  | 41  |
| HRC                  | 60                     | 100 | 75  | 90  | 130 | 110                    | 90  | 100 |     |     | 15                                        | 30  | 25  | 38  | 34  | 55                     | 60     | 42  | 55  | 55  |     |
| HB                   | 60                     | 100 | 75  | 90  | 130 | 110                    | 90  | 100 |     |     | 200                                       | 280 | 250 | 350 | 320 | 400Rm                  | 1050Rm | 550 | 630 | 400 | 550 |
| Recommended          |                        |     |     |     |     |                        |     |     |     |     |                                           | ○   |     |     |     | ○                      | ◎      |     |     |     |     |

CARBIDE

HSS

YG TAP Ti Ni

TZ903 SERIES

M

ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13

ISO MÉTRIQUE DIN13

ISO Metrico passo grosso DIN 13

Machine taps  
Maschinengewindebohrer

Suitable for tapping blind holes due to special flute geometry and excellent chip evacuation.

Geeignet zum Gewinden von Sacklöchern dank besonderer Nutengeometrie und ausgezeichneter Spanabfuhr.

DIN 371

DIN 376

Hole type

2.5×D

60°

P

L1

L2

L3

ØD2

ØD1

KI

L1

L2

L3

60°

P

Ød1

Ti

HSS PM

DIN 371/376

6H

60°

C

R25

TiAlN

p.B234

Plain Shank

TAPPING ER CHUCK

TAPPING CHUCK

ONE STEP TAPPING CHUCK

Unit : mm

| SIZE  | Pitch  | EDP No.  | Thread Length | Overall Length | Neck Length | Shank Diameter | Square Size | Square Length | No. of Flute | Tapping Drill Diameter |
|-------|--------|----------|---------------|----------------|-------------|----------------|-------------|---------------|--------------|------------------------|
| ØD1   | P      | TiAlN    | L1            | L2             | L3          | ØD2            | K           | KI            | Z            | Ød1                    |
| M2    | × 0.4  | TZ903136 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.6                    |
| M2.2  | × 0.45 | TZ903156 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.75                   |
| *M2.3 | × 0.4  | TZ903196 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.9                    |
| M2.5  | × 0.45 | TZ903176 | 9             | 50             | 15          | 2.8            | 2.1         | 5             | 3            | 2.05                   |
| *M2.6 | × 0.45 | TZ903496 | 9             | 50             | 15          | 2.8            | 2.1         | 5             | 3            | 2.1                    |
| M3    | × 0.5  | TZ903206 | 6             | 56             | 18          | 3.5            | 2.7         | 6             | 3            | 2.5                    |
| M3.5  | × 0.6  | TZ903226 | 7             | 56             | 20          | 4              | 3           | 6             | 3            | 2.9                    |
| M4    | × 0.7  | TZ903246 | 7             | 63             | 21          | 4.5            | 3.4         | 6             | 3            | 3.3                    |
| M4.5  | × 0.75 | TZ903266 | 8             | 70             | 25          | 6              | 4.9         | 8             | 3            | 3.7                    |
| M5    | × 0.8  | TZ903286 | 8             | 70             | 25          | 6              | 4.9         | 8             | 3            | 4.2                    |
| M6    | × 1.0  | TZ903316 | 10            | 80             | 30          | 6              | 4.9         | 8             | 3            | 5                      |
| M7    | × 1.0  | TZ903346 | 10            | 80             | 30          | 7              | 5.5         | 8             | 3            | 6                      |
| M8    | × 1.25 | TZ903366 | 13            | 90             | 35          | 8              | 6.2         | 9             | 3            | 6.8                    |
| M9    | × 1.25 | TZ903396 | 13            | 90             | 35          | 9              | 7           | 10            | 3            | 7.8                    |
| M10   | × 1.5  | TZ903426 | 15            | 100            | 39          | 10             | 8           | 11            | 3            | 8.5                    |
| M11   | × 1.5  | TZ903466 | 17            | 100            | 40          | 8              | 6.2         | 9             | 3            | 9.5                    |
| M12   | × 1.75 | TZ903506 | 18            | 110            | 44          | 9              | 7           | 10            | 3            | 10.2                   |
| M14   | × 2.0  | TZ903546 | 20            | 110            | 44          | 11             | 9           | 12            | 3            | 12                     |
| M16   | × 2.0  | TZ903606 | 20            | 110            | 44          | 12             | 9           | 12            | 3            | 14                     |
| M18   | × 2.5  | TZ903656 | 25            | 125            | 50          | 14             | 11          | 14            | 4            | 15.5                   |
| M20   | × 2.5  | TZ903706 |               |                |             |                |             |               |              |                        |







CARBIDE

HSS

YG

YG TAP Ti Ni

TM923 SERIES

M

ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13

ISO MÉTRIQUE DIN13

ISO Metrico passo grosso DIN 13

Machine taps  
Maschinengewindebohrer

For tapping Nickel alloys and heat resistant alloy steels which are used in aero space and chemical industries.

Zum Gewindeschneiden von Nickellegierungen und hitzefesten Legierungsstählen, die in der Luftfahrtindustrie und chemischen Industrie verwendet werden.

DIN 371

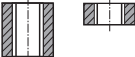


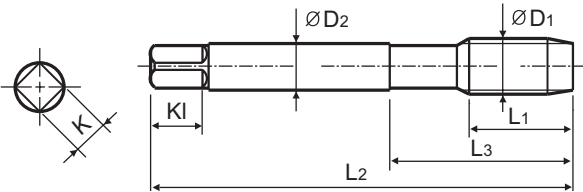
DIN 376

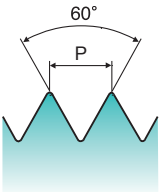


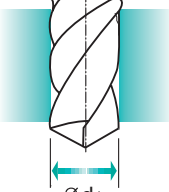
Hole type

3.0×D









Ni

HSS PM

DIN 371/376

6H

60°

B

Bright

p.B234

Plain Shank

TAPPING ER CHUCK

TAPPING CHUCK

ONE STEP TAPPING CHUCK

Unit : mm

| SIZE  | Pitch  | EDP No.  | Thread Length | Overall Length | Neck Length | Shank Diameter | Square Size | Square Length | No. of Flute | Tapping Drill Diameter |
|-------|--------|----------|---------------|----------------|-------------|----------------|-------------|---------------|--------------|------------------------|
| ØD1   | P      | Bright   | L1            | L2             | L3          | ØD2            | K           | Kl            | Z            | Ød1                    |
| M2    | × 0.4  | TM923136 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.6                    |
| M2.2  | × 0.45 | TM923156 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.75                   |
| *M2.3 | × 0.4  | TM923196 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.9                    |
| M2.5  | × 0.45 | TM923176 | 9             | 50             | 15          | 2.8            | 2.1         | 5             | 3            | 2.05                   |
| *M2.6 | × 0.45 | TM923496 | 9             | 50             | 15          | 2.8            | 2.1         | 5             | 3            | 2.1                    |
| M3    | × 0.5  | TM923206 | 11            | 56             | 18          | 3.5            | 2.7         | 6             | 3            | 2.5                    |
| M3.5  | × 0.6  | TM923226 | 12            | 56             | 20          | 4              | 3           | 6             | 3            | 2.9                    |
| M4    | × 0.7  | TM923246 | 13            | 63             | 21          | 4.5            | 3.4         | 6             | 3            | 3.3                    |
| M4.5  | × 0.75 | TM923266 | 14            | 70             | 25          | 6              | 4.9         | 8             | 3            | 3.7                    |
| M5    | × 0.8  | TM923286 | 15            | 70             | 25          | 6              | 4.9         | 8             | 3            | 4.2                    |
| M6    | × 1.0  | TM923316 | 17            | 80             | 30          | 6              | 4.9         | 8             | 3            | 5                      |
| M7    | × 1.0  | TM923346 | 17            | 80             | 30          | 7              | 5.5         | 8             | 3            | 6                      |
| M8    | × 1.25 | TM923366 | 20            | 90             | 35          | 8              | 6.2         | 9             | 3            | 6.8                    |
| M9    | × 1.25 | TM923396 | 20            | 90             | 35          | 9              | 7           | 10            | 3            | 7.8                    |
| M10   | × 1.5  | TM923426 | 22            | 100            | 39          | 10             | 8           | 11            | 3            | 8.5                    |
| M11   | × 1.5  | TM923466 | 22            | 100            | 40          | 8              | 6.2         | 9             | 3            | 9.5                    |
| M12   | × 1.75 | TM923506 | 24            | 110            | 44          | 9              | 7           | 10            | 3            | 10.2                   |
| M14   | × 2.0  | TM923546 | 26            | 110            | 44          | 11             | 9           | 12            | 3            | 12                     |
| M16   | × 2.0  | TM923606 | 27            | 110            | 44          | 12             | 9           | 12            | 3            | 14                     |
| M18   | × 2.5  | TM923656 | 30            | 125            | 50          | 14             | 11          | 14            | 4            | 15.5                   |
| M20   | × 2.5  | TM923706 | 32            | 140            | 54          | 16             | 12          | 15            | 4            | 17.5                   |
| M22   | × 2.5  | TM923746 | 32            | 140            | 54          | 18             | 14.5        | 17            | 4            | 19.5                   |
| M24   | × 3.0  | TM923786 | 34            | 160            | 60          | 18             | 14.5        | 17            | 4            | 21                     |
| M27   | × 3.0  | TM923866 | 36            | 160            | 60          | 20             | 16          | 19            | 4            | 24                     |
| M30   | × 3.5  | TM923946 | 40            | 180            | 70          | 22             | 18          | 21            | 4            | 26.5                   |

DIN 371(M2~M10) and DIN 376(M11~M30)

\* DIN profile not ISO

ISO

|             | P               |     |     |     |     | M               |     |     |     |     | K                                  |     |     |     |     |
|-------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|------------------------------------|-----|-----|-----|-----|
|             | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloyed steel, and tool steel |     |     |     |     |
| VDI 3323    | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                                 | 12  | 13  | 14  | 15  |
| HRC         | 13              | 25  | 28  | 32  | 30  | 10              | 29  | 32  | 38  | 15  | 35                                 | 15  | 23  | 10  | 10  |
| HB          | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                                | 180 | 260 | 160 | 160 |
| Recommended |                 |     |     |     |     | ◎               | ◎   | ◎   | ◎   |     |                                    |     |     |     |     |

|             | N                      |     |    |    |     | S                      |    |     |    |    | H                                         |     |     |     |     |
|-------------|------------------------|-----|----|----|-----|------------------------|----|-----|----|----|-------------------------------------------|-----|-----|-----|-----|
|             | Aluminum-wrought alloy |     |    |    |     | Aluminum-cast, alloyed |    |     |    |    | Copper and Copper Alloys (Bronze / Brass) |     |     |     |     |
| VDI 3323    | 21                     | 22  | 23 | 24 | 25  | 26                     | 27 | 28  | 29 | 30 | 31                                        | 32  | 33  | 34  | 35  |
| HRC         | 21                     | 22  | 23 | 24 | 25  | 26                     | 27 | 28  | 29 | 30 | 31                                        | 32  | 33  | 34  | 35  |
| HB          | 60                     | 100 | 75 | 90 | 130 | 110                    | 90 | 100 |    |    | 200                                       | 280 | 250 | 350 | 320 |
| Recommended |                        |     |    |    |     |                        |    |     |    |    | ◎                                         | ◎   | ◎   | ◎   | ◎   |

|             | Heat Resistant Super Alloys |        |     |     |     | Titanium Alloys |     |     |     |    | Hardened steel |    |    |    |    |
|-------------|-----------------------------|--------|-----|-----|-----|-----------------|-----|-----|-----|----|----------------|----|----|----|----|
|             |                             |        |     |     |     |                 |     |     |     |    |                |    |    |    |    |
| VDI 3323    | 36                          | 37     | 38  | 39  | 40  | 41              | 42  | 43  | 44  | 45 | 46             | 47 | 48 | 49 | 50 |
| HRC         | 36                          | 37     | 38  | 39  | 40  | 41              | 42  | 43  | 44  | 45 | 46             | 47 | 48 | 49 | 50 |
| HB          | 400Rm                       | 1050Rm | 550 | 630 | 400 | 550             | 630 | 400 | 550 |    |                |    |    |    |    |
| Recommended |                             |        |     |     |     |                 |     |     |     |    | ◎              | ◎  | ◎  | ◎  | ◎  |

YG-1 CO., LTD.

phone:+82-32-526-0909, www.yg1.solutions, E-mail:yg1@yg1.solutions

B228

CARBIDE

HSS

YG

YG TAP Ti Ni

TZ923 SERIES

M

ISO metric coarse threads DIN 13

Metrisches ISO-Gewinde DIN 13

ISO MÉTRIQUE DIN13

ISO Metrico passo grosso DIN 13

Machine taps  
Maschinengewindebohrer

For tapping Nickel alloys and heat resistant alloy steels which are used in aero space and chemical industries.

Zum Gewindeschneiden von Nickellegierungen und hitzefesten Legierungsstählen, die in der Luftfahrtindustrie und chemischen Industrie verwendet werden.

DIN 371

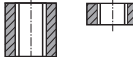


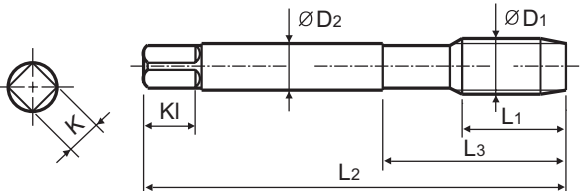
DIN 376

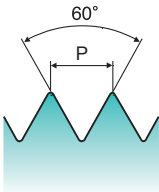


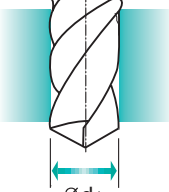
Hole type

3.0×D









Ni

HSS PM

DIN 371/376

6H

60°

B

TiAIN

p.B234

Plain Shank

TAPPING ER CHUCK

TAPPING CHUCK

ONE STEP TAPPING CHUCK

Unit : mm

| SIZE  | Pitch  | EDP No.  | Thread Length | Overall Length | Neck Length | Shank Diameter | Square Size | Square Length | No. of Flute | Tapping Drill Diameter |
|-------|--------|----------|---------------|----------------|-------------|----------------|-------------|---------------|--------------|------------------------|
| ØD1   | P      | TiAIN    | L1            | L2             | L3          | ØD2            | K           | Kl            | Z            | Ød1                    |
| M2    | × 0.4  | TZ923136 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.6                    |
| M2.2  | × 0.45 | TZ923156 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.75                   |
| *M2.3 | × 0.4  | TZ923196 | 8             | 45             | 13          | 2.8            | 2.1         | 5             | 3            | 1.9                    |
| M2.5  | × 0.45 | TZ923176 | 9             | 50             | 15          | 2.8            | 2.1         | 5             | 3            | 2.05                   |
| *M2.6 | × 0.45 | TZ923496 | 9             | 50             | 15          | 2.8            | 2.1         | 5             | 3            | 2.1                    |
| M3    | × 0.5  | TZ923206 | 11            | 56             | 18          | 3.5            | 2.7         | 6             | 3            | 2.5                    |
| M3.5  | × 0.6  | TZ923226 | 12            | 56             | 20          | 4              | 3           | 6             | 3            | 2.9                    |
| M4    | × 0.7  | TZ923246 | 13            | 63             | 21          | 4.5            | 3.4         | 6             | 3            | 3.3                    |
| M4.5  | × 0.75 | TZ923266 | 14            | 70             | 25          | 6              | 4.9         | 8             | 3            | 3.7                    |
| M5    | × 0.8  | TZ923286 | 15            | 70             | 25          | 6              | 4.9         | 8             | 3            | 4.2                    |
| M6    | × 1.0  | TZ923316 | 17            | 80             | 30          | 6              | 4.9         | 8             | 3            | 5                      |
| M7    | × 1.0  | TZ923346 | 17            | 80             | 30          | 7              | 5.5         | 8             | 3            | 6                      |
| M8    | × 1.25 | TZ923366 | 20            | 90             | 35          | 8              | 6.2         | 9             | 3            | 6.8                    |
| M9    | × 1.25 | TZ923396 | 20            | 90             | 35          | 9              | 7           | 10            | 3            | 7.8                    |
| M10   | × 1.5  | TZ923426 | 22            | 100            | 39          | 10             | 8           | 11            | 3            | 8.5                    |
| M11   | × 1.5  | TZ923466 | 22            | 100            | 40          | 8              | 6.2         | 9             | 3            | 9.5                    |
| M12   | × 1.75 | TZ923506 | 24            | 110            | 44          | 9              | 7           | 10            | 3            | 10.2                   |
| M14   | × 2.0  | TZ923546 | 26            | 110            | 44          | 11             | 9           | 12            | 3            | 12                     |
| M16   | × 2.0  | TZ923606 | 27            | 110            | 44          | 12             | 9           | 12            | 3            | 14                     |
| M18   | × 2.5  | TZ923656 | 30            | 125            | 50          | 14             | 11          | 14            | 4            | 15.5                   |
| M20   | × 2.5  | TZ923706 | 32            | 140            | 54          | 16             | 12          | 15            | 4            | 17.5                   |
| M22   | × 2.5  | TZ923746 | 32            | 140            | 54          | 18             | 14.5        | 17            | 4            | 19.5                   |
| M24   | × 3.0  | TZ923786 | 34            | 160            | 60          | 18             | 14.5        | 17            | 4            | 21                     |
| M27   | × 3.0  | TZ923866 | 36            | 160            | 60          | 20             | 16          | 19            | 4            | 24                     |
| M30   | × 3.5  | TZ923946 | 40            | 180            | 70          | 22             | 18          | 21            | 4            | 26.5                   |

DIN 371(M2~M10) and DIN 376(M11~M30)

\* DIN profile not ISO

ISO

|             | P               |     |     |     |     | M               |     |     |     |     | K                                  |     |     |     |     |
|-------------|-----------------|-----|-----|-----|-----|-----------------|-----|-----|-----|-----|------------------------------------|-----|-----|-----|-----|
|             | Non-alloy steel |     |     |     |     | Low alloy steel |     |     |     |     | High alloyed steel, and tool steel |     |     |     |     |
| VDI 3323    | 1               | 2   | 3   | 4   | 5   | 6               | 7   | 8   | 9   | 10  | 11                                 | 12  | 13  | 14  | 15  |
| HRC         | 13              | 25  | 28  | 32  | 30  | 10              | 29  | 32  | 38  | 15  | 35                                 | 15  | 23  | 10  | 10  |
| HB          | 125             | 190 | 250 | 270 | 300 | 180             | 275 | 300 | 350 | 200 | 325                                | 180 | 260 | 160 | 160 |
| Recommended |                 |     |     |     |     | ◎               | ◎   | ◎   | ◎   |     |                                    |     |     |     |     |

|             | N                      |     |    |    |     | S                      |    |     |    |    | H                                         |     |     |     |     |
|-------------|------------------------|-----|----|----|-----|------------------------|----|-----|----|----|-------------------------------------------|-----|-----|-----|-----|
|             | Aluminum-wrought alloy |     |    |    |     | Aluminum-cast, alloyed |    |     |    |    | Copper and Copper Alloys (Bronze / Brass) |     |     |     |     |
| VDI 3323    | 21                     | 22  | 23 | 24 | 25  | 26                     | 27 | 28  | 29 | 30 | 31                                        | 32  | 33  | 34  | 35  |
| HRC         | 21                     | 22  | 23 | 24 | 25  | 26                     | 27 | 28  | 29 | 30 | 31                                        | 32  | 33  | 34  | 35  |
| HB          | 60                     | 100 | 75 | 90 | 130 | 110                    | 90 | 100 |    |    | 200                                       | 280 | 250 | 350 | 320 |
| Recommended |                        |     |    |    |     |                        |    |     |    |    | ◎                                         | ◎   | ◎   | ◎   | ◎   |

|             | Heat Resistant Super Alloys |        |     |     |     | Titanium Alloys |     |     |     |    | Hardened steel |    |    |    |    |
|-------------|-----------------------------|--------|-----|-----|-----|-----------------|-----|-----|-----|----|----------------|----|----|----|----|
|             |                             |        |     |     |     |                 |     |     |     |    |                |    |    |    |    |
| VDI 3323    | 36                          | 37     | 38  | 39  | 40  | 41              | 42  | 43  | 44  | 45 | 46             | 47 | 48 | 49 | 50 |
| HRC         | 36                          | 37     | 38  | 39  | 40  | 41              | 42  | 43  | 44  | 45 | 46             | 47 | 48 | 49 | 50 |
| HB          | 400Rm                       | 1050Rm | 550 | 630 | 400 | 550             | 630 | 400 | 550 |    |                |    |    |    |    |
| Recommended |                             |        |     |     |     |                 |     |     |     |    | ◎              | ◎  | ◎  | ◎  | ◎  |

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B229











|          |          |                             |        |     | TM903       | TZ903 | TM293 | TZ293 | TM933 | TZ933 | TM923 | TZ923 | TQ833 | TR833 | TQ873 | TR873 |
|----------|----------|-----------------------------|--------|-----|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ISO      | VDI 3323 | Material Description        | HB     | HRC | Vc (m/min.) |       |       |       |       |       |       |       |       |       |       |       |
| <b>P</b> | 6        | Low alloy steel             | 180    | 10  |             |       |       |       | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 |
|          | 7        |                             | 275    | 29  | 10-15       | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 |
|          | 8        |                             | 300    | 32  | 6-10        | 6-10  | 6-10  | 6-10  | 6-10  | 6-10  | 6-10  | 6-10  | 6-10  | 6-10  | 6-10  | 6-10  |
|          | 9        |                             | 350    | 38  | 3-5         | 3-5   | 3-5   | 3-5   | 3-5   | 3-5   | 3-5   | 3-5   | 3-5   | 3-5   | 3-5   | 3-5   |
| <b>S</b> | 31       | Heat Resistant Super Alloys | 200    | 15  | 10-15       | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 |
|          | 32       |                             | 280    | 30  |             |       | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 | 10-15 |
|          | 33       |                             | 250    | 25  |             |       | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   |
|          | 34       |                             | 350    | 38  |             |       | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   |
|          | 35       | Titanium Alloys             | 320    | 34  |             |       | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   | 2-4   |
|          | 36       |                             | 400Rm  |     | 10-15       | 10-15 | 10-15 | 10-15 |       |       |       |       | 10-15 | 10-15 | 10-15 | 10-15 |
|          | 37       |                             | 1050Rm |     | 4-6         | 4-6   | 4-6   | 4-6   | 4-6   | 4-6   | 4-6   | 4-6   | 4-6   | 4-6   | 4-6   | 4-6   |
| <b>H</b> | 38       | Hardened steel              | 550    | 55  |             |       |       |       |       |       |       | 3-5   |       |       |       |       |
|          | 40       | Chilled Cast Iron           | 400    | 42  |             |       | 3-5   | 3-5   |       |       | 3-5   | 3-5   |       |       | 3-5   | 3-5   |