



# GENERAL CATALOGUE



**AR5AM**

**VERGNANO**

# 8 0 - E N

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ARTICLE LEGEND

- A...

P...

S...

H...

B...
- Taps for Generic Applications

High Performance Taps

Synchronous Taps

Solid Carbide Taps

Taps with internal coolant supply
- ...

FC

...

FP
- Taps for blind holes

Taps for through holes
- ...

S

...

L

...

N

...

R

...

E

...

EG

...

LH

...

AZ
- Taps with increased relief

Taps with long shank

Forming taps with oil grooves

Forming taps with internal coolant supply and radial outlet

Taps with short chamfer (Form E)

Taps for wire thread inserts

Taps with left hand thread

Taps with interrupted thread

- SERIES
- MATERIAL
- CHAMFER FORM
- TYPE OF HOLE
- COATING
- LUBRICATION

TAP MATERIAL

- HSS

HSSE

HSSK

HSSZ

HSSP

HM
- Conventional high speed steel

Conventional high speed steel

Powder metallurgy high speed steel

Powder metallurgy high speed steel

Powder metallurgy high speed steel

Solid Carbide

LUBRICATION

- E

O

MQL
- Emulsion

Oil

Minimum quantity lubrication

TAP APPLICATION TABLE LEGEND

- A1

34

Product code / page
- 20-25

Ideal tap / cutting speed m/min
- 15-20

Suitable tap / cutting speed m/min

|           |            |
|-----------|------------|
| M         | 4H         |
|           | 6H/6HX     |
|           | 6G/6GX     |
|           | 7G/7GX     |
|           | 6H +0,1    |
| EG-M      | 6H MOD     |
| MF        | 6H/6HX     |
|           | 6G/6GX     |
| UNC       | 2B/2BX     |
|           | 3B         |
| UNF       | 2B/2BX     |
|           | 3B         |
| 8-UN      | 2B         |
| G         | ISO 5969/X |
| Rp (BSPP) | --         |
| Rc (BSPT) | --         |
| BSW       | mc         |
| NPT       | --         |
| NPTF      | --         |

| ISO513 | Material                                   | Group | Application                                                                    | R. N/mm²    | Lubrication |
|--------|--------------------------------------------|-------|--------------------------------------------------------------------------------|-------------|-------------|
| P      | Steel                                      | P.1   | Mild / magnetic steel                                                          | 200 - 400   | E, O, MQL   |
|        |                                            | P.2   | Construction steel, case hardening steel                                       | 350 - 700   | E, O, MQL   |
|        |                                            | P.3   | Carbon steel                                                                   | 350 - 850   | E, O, MQL   |
|        |                                            | P.4   | Alloyed steel / tempered steel                                                 | 500 - 850   | E, O, MQL   |
|        |                                            | P.5   | Alloyed steel / tempered steel                                                 | 850 - 1200  | E, O, MQL   |
|        |                                            | P.6   | Alloyed steel / high strength steel                                            | 1200 - 1600 | O           |
|        |                                            | P.7   | Ferritic stainless steel, martensitic stainless steel, precipitation hardening | < 1000      | E, O, MQL   |
| M      | Stainless steel                            | M.1   | Austenitic stainless steel                                                     | < 850       | E, O, MQL   |
|        |                                            | M.2   | Ferritic+austenitic (Duplex)                                                   | < 1000      | O, MQL      |
| K      | Cast iron                                  | K.1   | Grey cast iron                                                                 | < 1000      | E, O, MQL   |
|        |                                            | K.2   | Nodular cast iron, malleable cast iron, tempered cast iron                     | < 1000      | E, O, MQL   |
|        |                                            | K.3   | Austempered ductile iron (ADI)                                                 | < 1400      | O, MQL      |
| N      | Aluminium<br>Aluminium alloys              | N.1   | Pure aluminium                                                                 | < 300       | E, O, MQL   |
|        |                                            | N.2   | Aluminium wrought and die cast alloys with Si < 0,5% (long chipping)           | < 500       | E, O, MQL   |
|        |                                            | N.3   | Aluminium wrought and die cast alloys with Si < 10% (medium chipping)          | < 500       | E, O, MQL   |
|        |                                            | N.4   | Aluminium die cast alloys with Si > 10% (short chipping)                       | < 600       | E, O, MQL   |
|        | Copper<br>Copper alloys<br>Brass<br>Bronze | N.5   | Pure copper                                                                    | 250 - 350   | E, O, MQL   |
|        |                                            | N.6   | Copper alloys (long chipping), soft brass                                      | < 700       | E, O, MQL   |
|        |                                            | N.7   | Copper alloys (short chipping), hard brass                                     | < 700       | E, O, MQL   |
|        |                                            | N.8   | High strength bronze                                                           | 700 - 1500  | O           |
|        | Magnesium<br>Magnesium alloys              | N.9   | Pure magnesium, magnesium alloys                                               | 120 - 300   | E, O, MQL   |
|        |                                            | N.10  | High strength magnesium alloys                                                 | 240 - 400   | E, O, MQL   |
| S      | Titanium<br>Titanium alloys                | S.1   | Pure titanium                                                                  | 400 - 600   | E, O, MQL   |
|        |                                            | S.2   | Titanium alloys                                                                | 600 - 1000  | O, MQL      |
|        | Nickel<br>Nickel alloys                    | S.3   | Pure nickel                                                                    | 400 - 600   | E, O, MQL   |
|        |                                            | S.4   | Nickel alloys                                                                  | 600 - 1000  | O, MQL      |
| H      | Hardened<br>materials                      | H.1   | Alloyed steel, hardness HRC 44-55                                              | -           | O           |
|        |                                            | H.2   | Alloyed steel, hardness HRC 56-63                                              | -           | O           |

\*For specific material examples see "Technical Information" section on page 244

# G E N E R A L   C A T A L O G U E



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Company

## About us

With more than 80 years of experience in the cutting tool industry, Vergnano is one of the world's leading manufacturers of high quality precision threading taps, hobs, end mills.

While keeping a firm foothold in the honoured tradition of the Vergnano brand, Vergnano has established itself internally and is renowned for quality, reliability, flexibility, innovation and commitment.



## Strengths

### Flexibility, readiness, quality

- Short decision-making processes.
- Rapid response times at all stages of the process.
- Flexibility in satisfying client requests for changes.
- Efficient and reliable technical support.
- Continuous employee training.
- Consistent product quality 100% guaranteed by qualified personnel.



## Each manufacturing step takes place internally at the Vergnano production plant

Starting from the steel bar through to the final PVD coating process of the finished tool.

**The quality of Vergnano tools is the consequence of strict controls of processes and products, constant research in new technical solutions and continuous investments in state-of-the-art technology.**



## Certifications



### ISO 9001

#### Quality certificate

Thanks to the commitment on the research of high efficiency standards, Vergnano obtained ISO 9001 certification, according to UNI EN ISO 9001:2015.



### ISO 14001

#### Sustainability certificate

Vergnano obtained Environmental Management System Certificate ISO 14001 putting Sustainability at the heart of its ethics.



## Highlights

### Expansion of high-performance cutting taps range for UNC and UNF threads:

- P19 / P20 for through holes
- P60 / P61 for deep blind holes
- Multilayer TiH1 coating
- Powder metallurgy steel for extended tool life



## P SERIES

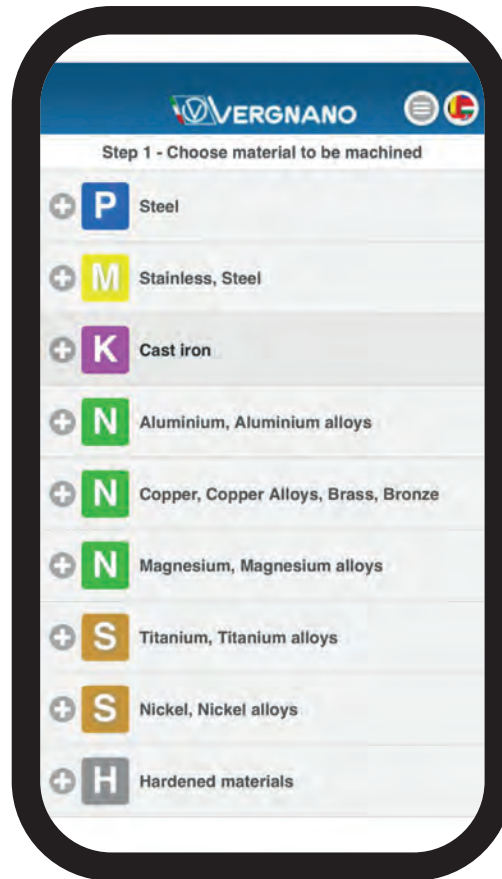


## P SERIES



### Expansion of high-performance cutting taps range for stainless steels:

- P151 for through holes for MF threads
- P170E for deep blind holes with short chamfer form E
- BP170 for deep blind holes with axial internal cooling
- P171 for deep blind holes for MF threads



Exploit the full potential of Vergnano taps in a few simple steps

Search for best suited tool based on application data

Browse through tool technical specifications and cutting data for each search result



Download  
TAppFinder  
for iOS and Android



## Programm overview

A



### A SERIES

TAPS FOR GENERAL APPLICATIONS  
The renowned Vergnano A-Series provides tapping solutions for almost all types of general applications.

P



### P SERIES

TAPS FOR HIGH PERFORMANCE  
P-Series comprises high performance taps for the highest demands in terms of productivity.

S



### S SERIES

TAPS FOR SYNCHRONOUS TAPPING  
S-Series are specifically designed for synchronous/rigid tapping and high speed machining.

H



### H SERIES

SOLID CARBIDE TAPS  
Solid carbide H Series taps offer extremely high productivity both in terms of tool life and cutting speeds.

F



## F SERIES

DIES FOR GENERAL APPLICATIONS

F Series dies provide solutions for machining external threads in almost all types of general applications.

VR



## VR SERIES

SOLID CARBIDE THREAD MILLS

Solid carbide thread mills for high productivity demands and optimal quality-price ratio.

VA



## VA SERIES

MODULAR TAPPING ATTACHMENTS

VA Series modular tapping attachments offer good flexibility on synchronous tapping applications.

# CONSULTATION GUIDE

## Tap application table

ARTICLE LEGEND

A...

Taps for Generic Applications

P...

High Performance Taps

S...

Synchronous Taps

H...

Solid Carbide Taps

B...

Taps with internal coolant supply

... FC

Taps for blind holes

... FP

Taps for through holes

... S

Taps with increased relief

... L

Taps with long shank

... N

Forming taps with oil grooves

... R

Forming taps with internal coolant supply

... E

Taps with short chamfer (Form E)

... EG

Taps for wire thread inserts

... LH

Taps with left hand thread

... AZ

Taps with interrupted thread

TAP MATERIAL

HSS

Conventional high speed steel

HSSE

Conventional high speed steel

HSSK

Powder metallurgy high speed steel

HSSZ

Powder metallurgy high speed steel

HSSP

Powder metallurgy high speed steel

HM

Solid Carbide

LUBRICATION

E

Emulsion

O

Oil

MQL

Minimum quantity lubrication

TAP APPLICATION TABLE LEGEND

A1

34

Product code / page

● 20-25

Ideal tap / cutting speed m/min

○ 15-20

Suitable tap / cutting speed m/min

1

ISO 513

Material

Group

P

Steel

P.1

Mild / magnetic steel

P.2

Construction steel, ca

P.3

Carbon steel

P.4

Alloyed steel / temper

P.5

Alloyed steel / temper

P.6

Alloyed steel / high st

P.7

Ferritic stainless steel

M

Stainless steel

M.1

Austenitic stainless s

M.2

Ferritic-austenitic (D

K

Cast iron

K.1

Grey cast iron

K.2

Nodular cast iron, ma

K.3

Austempered ductile

2

Aluminium

Aluminium alloys

N.1

Pure aluminium

N.2

Aluminium wrought an

N.3

Aluminium wrought an

N.4

Aluminium die cast al

N

Copper

Copper alloys

Brass

Bronze

N.5

Pure copper

N.6

Copper alloys (long ch

N.7

Copper alloys (short c

N.8

High strength bronze

Magnesium

Magnesium alloys

N.9

Pure magnesium, ma

N.10

High strength magne

S

Titanium

Titanium alloys

S.1

Pure titanium

S.2

Titanium alloys

Nickel

Nickel alloys

S.3

Pure nickel

S.4

Nickel alloys

H

Hardened materials

H.1

Alloyed steel, hardnes

H.2

Alloyed steel, hardnes

\*For specific material examples see "Technical Information" section

\*For specific material examples see "Technical Information" section of the catalog

| TAP APPLICATION |           |            |         |         |        |     |  |       |     |
|-----------------|-----------|------------|---------|---------|--------|-----|--|-------|-----|
| 3               |           |            |         |         |        |     |  |       |     |
| 7               |           |            |         |         |        |     |  |       |     |
| 6               | M         | 4H         |         |         |        |     |  | A15 S | 47  |
|                 |           | 6H/6HX     |         |         |        |     |  | A15 S | 45  |
|                 |           | 6G/6GX     |         |         |        |     |  | A15 S | 48  |
|                 |           | 7G/7GX     |         |         |        |     |  | A15 S | 49  |
|                 |           | 6H +0,1    |         |         |        |     |  |       |     |
|                 | EG-M      | 6H MOD     |         |         |        |     |  |       |     |
|                 |           | 6H/6HX     |         |         |        |     |  | A17 S | 86  |
|                 | MF        | 6G/6GX     |         |         |        |     |  | A17 S | 90  |
|                 |           | 2B/2BX     | A27 FP  | 102     | A27 FP | 102 |  | A19 S | 104 |
|                 | UNC       | 3B         |         |         |        |     |  | A19 S | 104 |
|                 |           | 2B/2BX     | A28 FP  | 110     | A28 FP | 110 |  | A20 S | 112 |
|                 | UNF       | 3B         |         |         |        |     |  | A20 S | 112 |
|                 |           | 2B         |         |         |        |     |  | A119  | 117 |
|                 | 8-UN      | 2B         |         |         |        |     |  | A18 S | 122 |
|                 |           | ISO 5989/X | A26 FP  | 120     |        |     |  |       |     |
| 5               | Rp (BSPP) | --         |         |         |        |     |  |       |     |
|                 | Rc (BSPT) | --         |         |         |        |     |  |       |     |
|                 | BSW       | mc         | A24 FP  | 130     |        |     |  |       |     |
|                 | NPT       | --         |         |         |        |     |  |       |     |
|                 | NPTF      | --         |         |         |        |     |  |       |     |
| ISO 513         | Group     |            |         |         |        |     |  |       |     |
| P               | P.1       | ○ 12-15    | ● 20-25 | ○ 18-20 |        |     |  |       |     |
|                 | P.2       | ● 10-12    | ● 15-20 | ● 20-25 |        |     |  |       |     |
|                 | P.3       | ● 8-10     | ● 12-15 | ● 15-20 |        |     |  |       |     |
|                 | P.4       |            |         | ● 12-15 |        |     |  |       |     |
|                 | P.5       |            |         | ○ 3-5   |        |     |  |       |     |
|                 | P.6       |            |         |         |        |     |  |       |     |
|                 | P.7       |            |         | ○ 5-7   |        |     |  |       |     |
| M               | M.1       |            |         | ○ 5-7   |        |     |  |       |     |
|                 | M.2       |            |         | ○ 2-3   |        |     |  |       |     |
| K               | K.1       |            |         |         |        |     |  |       |     |
|                 | K.2       | ● 8-10     | ● 12-15 | ● 15-20 |        |     |  |       |     |
|                 | K.3       |            |         |         |        |     |  |       |     |
| N               | N.1       | ○ 12-15    | ● 20-25 | ○ 18-20 |        |     |  |       |     |
|                 | N.2       | ○ 10-12    | ○ 15-20 | ● 20-25 |        |     |  |       |     |
|                 | N.3       | ○ 10-12    | ○ 15-20 | ● 20-25 |        |     |  |       |     |
|                 | N.4       |            |         |         |        |     |  |       |     |
|                 | N.5       | ○ 10-12    | ● 15-20 | ○ 15-18 |        |     |  |       |     |
|                 | N.6       | ○ 8-10     | ○ 12-15 | ● 15-18 |        |     |  |       |     |
|                 | N.7       |            |         |         |        |     |  |       |     |
|                 | N.8       |            |         |         |        |     |  |       |     |
|                 | N.9       |            |         |         |        |     |  |       |     |
|                 | N.10      |            |         |         |        |     |  |       |     |
| S               | S.1       |            |         | ○ 8-10  |        |     |  |       |     |
|                 | S.2       |            |         |         |        |     |  |       |     |
|                 | S.3       |            |         | ○ 8-10  |        |     |  |       |     |
|                 | S.4       |            |         |         |        |     |  |       |     |
| H               | H.1       |            |         |         |        |     |  |       |     |
|                 | H.2       |            |         |         |        |     |  |       |     |

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In order to select the correct tap, follow steps 1 to 9.

- 1 Material
- 2 Material subgroup
- 3 Hole type
- 4 Thread depth
- 5 Thread type
- 6 Tolerance
- 7 Coating
- 8 Tool code (page)
- 9 Cutting parameters

# CONSULTATION GUIDE

Tap datasheet

1

2

3

4

5

6

MF

VERGNANO

DIN 13

HIGH PERFORMANCE MACHINE TAPS for blind and through holes  
Straight flutes / for cast iron

P45  
V-MAXX

BP45  
V-MAXX

P45 E  
V-MAXX

BP45 E  
V-MAXX

DIN 374

P SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG     | P45<br>V-MAXX | BP45<br>V-MAXX | P45 E<br>V-MAXX | BP45 E<br>V-MAXX |
|-----|--------|---------------|----------------|-----------------|------------------|
| K   | K.1    | • 40-50       | • 40-50        | • 40-50         | • 40-50          |
| N   | N.4    | • 40-50       | • 40-50        | • 40-50         | • 40-50          |
|     | N.7    | • 40-50       | • 40-50        | • 40-50         | • 40-50          |
|     | N.9-10 | • 45-55       | • 45-55        | • 45-55         | • 45-55          |

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>je 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z | Ød <sub>2</sub><br>h9 | P45<br>V-MAXX<br>...0455A1AV0 | BP45<br>V-MAXX<br>...0455M1AV0 | P45 E<br>V-MAXX<br>...0455A3AV0 | BP45 E<br>V-MAXX<br>...0455M3AV0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|---|-----------------------|-------------------------------|--------------------------------|---------------------------------|----------------------------------|
| M8              | 1    | 90                      | 16             | -              | 6                     | 4,9      | 4 | 7                     | A08100...                     | A08100...                      | A08100...                       | A08100...                        |
| 10              | 1    | 90                      | 18             | -              | 7                     | 5,5      | 4 | 9                     | A10100...                     | A10100...                      | A10100...                       | A10100...                        |
| 10              | 1,25 | 100                     | 18             | -              | 7                     | 5,5      | 4 | 8,8                   | A10125...                     | A10125...                      | A10125...                       | A10125...                        |
| 12              | 1,25 | 100                     | 22             | -              | 9                     | 7        | 4 | 10,8                  | A12125...                     | A12125...                      | A12125...                       | A12125...                        |
| 12              | 1,5  | 100                     | 22             | -              | 9                     | 7        | 4 | 10,5                  | A12150...                     | A12150...                      | A12150...                       | A12150...                        |
| 14              | 1,25 | 100                     | 22             | -              | 11                    | 9        | 4 | 12,8                  | A14125...                     | A14125...                      | A14125...                       | A14125...                        |
| 14              | 1,5  | 100                     | 22             | -              | 11                    | 9        | 4 | 12,5                  | A14150...                     | A14150...                      | A14150...                       | A14150...                        |
| 16              | 1,5  | 100                     | 22             | -              | 12                    | 9        | 4 | 14,5                  | A16150...                     | A16150...                      | A16150...                       | A16150...                        |
| 20              | 1,5  | 125                     | 25             | -              | 16                    | 12       | 4 | 18,5                  | A20150...                     | A20150...                      | A20150...                       | A20150...                        |

15

14

13

12

11

10

9

8

7

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Order example for P45 V-MAXX M8x1 --> A081000455A1AV0

€ P.47

- 1 Thread type

2 Application characteristics

3 Dimensional standard

4 Recommended application range

5 Sizes

6 Order example

7 Price list page reference

8 Standard execution

9 Through coolant

10 Direction of cut

11 Hole type

12 Chamfer form

13 Tolerance

14 Coating

15 Tool code



# CONSULTATION GUIDE

## Thread mill datasheet

1

ISO

DIN 13

VERGNANO

SOLID CARBIDE THREAD MILLS  
Spiral flutes

12

2

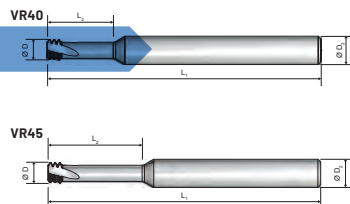
INT

HM

VR40  
TiAlN

VR45  
TiAlN

3



11

4

APPLICATION RANGE

| ISO | VR40<br>TiAlN | VR45<br>TiAlN |
|-----|---------------|---------------|
| P   | •             | •             |
| M   | •             | •             |
| K   | •             | •             |
| N   | •             | •             |
| S   | •             | •             |

For cutting data see page 213

INT

INT

10

2xD

3xD

9

RH

RH

8

5

VR  
SERIES

| P    | M    | ØD <sub>2</sub><br>h6<br>[mm] | ØD<br>[mm] | z | L <sub>2</sub><br>[mm] | L <sub>1</sub><br>[mm] | VR40<br>TiAlN   | VR45<br>TiAlN   |
|------|------|-------------------------------|------------|---|------------------------|------------------------|-----------------|-----------------|
| 0.3  | M1.4 | 3                             | 1.05       | 3 | 4                      | 39                     |                 | VR45010I0300400 |
| 0.35 | M1.6 | 3                             | 1.2        | 3 | 4.8                    | 39                     |                 | VR45012I0350400 |
| 0.4  | M2   | 6                             | 1.53       | 3 | 4.5                    | 58                     | VR40015I0400400 |                 |
| 0.4  | M2   | 3                             | 1.53       | 3 | 6                      | 39                     |                 | VR45015I0400600 |
| 0.5  | M3   | 6                             | 2.37       | 3 | 6.5                    | 58                     | VR40023I0500600 |                 |
| 0.5  | M3   | 6                             | 2.37       | 3 | 9.5                    | 58                     |                 | VR45023I0500900 |
| 0.5  | M3   | 6                             | 2.37       | 3 | 9.5                    | 105                    |                 | VR45023I050090L |
| 0.7  | M4   | 6                             | 3.1        | 3 | 9                      | 58                     | VR40031I0700900 |                 |
| 0.7  | M4   | 6                             | 3.1        | 3 | 12.5                   | 58                     |                 | VR45031I0701200 |
| 0.7  | M4   | 6                             | 3.1        | 3 | 12.5                   | 105                    |                 | VR45031I070120L |
| 0.8  | M5   | 6                             | 3.8        | 3 | 12.5                   | 58                     | VR40038I0801200 |                 |
| 0.8  | M5   | 6                             | 3.8        | 3 | 16                     | 58                     |                 | VR45038I0801600 |
| 0.8  | M5   | 6                             | 3.8        | 3 | 16                     | 105                    |                 | VR45038I080160L |
| 1    | M6   | 6                             | 4.65       | 3 | 14                     | 58                     | VR40046I1001400 |                 |
| 1    | M6   | 6                             | 4.65       | 3 | 20                     | 58                     |                 | VR45046I1002000 |
| 1    | M6   | 6                             | 4.65       | 3 | 20                     | 105                    |                 | VR45046I100200L |
| 1.25 | M8   | 6                             | 5.95       | 3 | 18                     | 58                     | VR40059I1251800 |                 |
| 1.25 | M8   | 6                             | 6          | 3 | 24                     | 58                     |                 | VR45060I1252400 |
| 1.5  | M10  | 8                             | 7.8        | 3 | 23                     | 64                     | VR40078I1502300 |                 |
| 1.75 | M12  | 10                            | 9          | 3 | 26                     | 73                     | VR40090I1752600 |                 |
| 2    | M16  | 12                            | 11.8       | 4 | 35                     | 84                     | VR40118I2003500 |                 |

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Order example for VR45 TiAlN P 0.3 → VR45010I0300400

€ P.63

6

- Thread type
- Application characteristics
- Technical Drawing
- Application range
- Sizes
- Price list page reference

- Tool code
- Direction of cut
- Hole type
- Thread
- Coating
- Tool code

# CONSULTATION GUIDE

## Tapping attachment datasheet



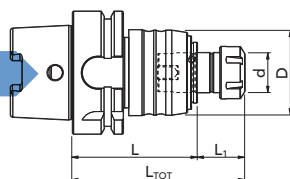
SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR  
With internal through coolant capability (1)

1



DIN 69893 HSK A

2



3

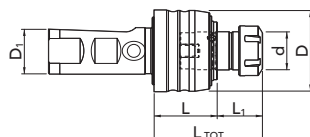
| Article Code    | Attachment | Tap Size  | L<br>[mm] | ø D<br>[mm] | ø d<br>[mm] | ER collet | L <sub>1</sub><br>[mm] | L <sub>TOT</sub><br>[mm] |
|-----------------|------------|-----------|-----------|-------------|-------------|-----------|------------------------|--------------------------|
| VA01A06302CH160 | HSK-A63    | M3 - M8   | 64        | 43          | 20          | ER 16     | 20,5                   | 84,5                     |
| VA01A06302CH250 | HSK-A63    | M6 - M20  | 97        | 60          | 32          | ER 25     | 23,5                   | 120,5                    |
| VA01A10002CH400 | HSK-A100   | M14 - M33 | 115       | 87          | 50          | ER 40     | 28,5                   | 143,5                    |

4

SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR  
With internal through coolant capability (1)



DIN 1835 B+E



VA  
SERIES

| Article Code    | Attachment | Tap Size  | L<br>[mm] | ø D<br>[mm] | ø d<br>[mm] | ER collet | L <sub>1</sub><br>[mm] | L <sub>TOT</sub><br>[mm] |
|-----------------|------------|-----------|-----------|-------------|-------------|-----------|------------------------|--------------------------|
| VA01C02502CH160 | 25         | M3 - M8   | 34        | 43          | 20          | ER 16     | 20,5                   | 54,5                     |
| VA01C02502CH250 | 25         | M6 - M20  | 56        | 60          | 32          | ER 25     | 23,5                   | 79,5                     |
| VA01C04002CH400 | 40         | M14 - M33 | 80        | 87          | 50          | ER 40     | 28,5                   | 108,5                    |

(1) For coolant pressure above 50 bars a special nut screw is available on request

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€ P.66

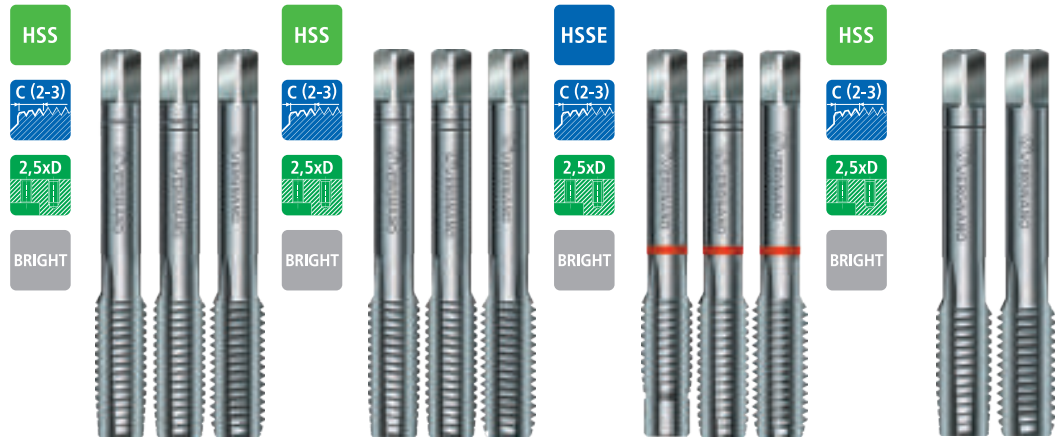
6

- 1 Application characteristics
- 2 Technical Drawing
- 3 Size

- 4 Tool code
- 5 Price list page reference



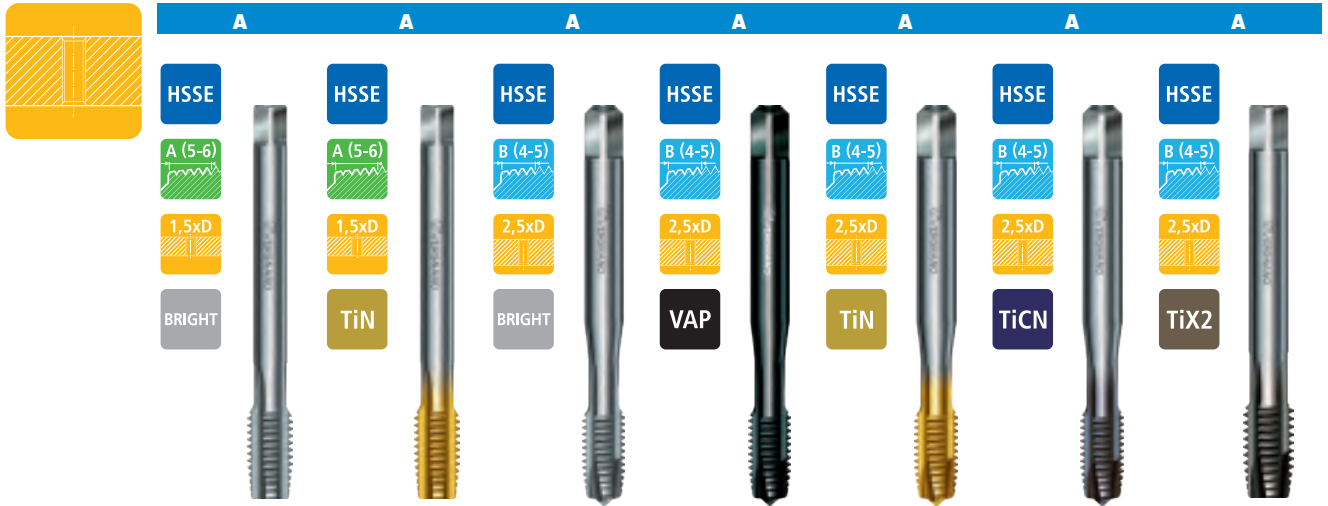
# TAP APPLICATION TABLE



|           |            |    |     |      |        |
|-----------|------------|----|-----|------|--------|
| M         | 4H         |    |     |      |        |
|           | 6H/6HX     | A1 | 34  | A1LH | 36     |
|           | 6G/6GX     |    |     |      |        |
|           | 7G/7GX     |    |     |      |        |
|           | 6H +0,1    |    |     |      |        |
| EG-M      | 6H MOD     |    |     |      |        |
| MF        | 6H/6HX     |    |     |      | A2 78  |
|           | 6G/6GX     |    |     |      |        |
| UNC       | 2B/2BX     | A7 | 101 |      |        |
|           | 3B         |    |     |      |        |
| UNF       | 2B/2BX     |    |     |      | A8 109 |
|           | 3B         |    |     |      |        |
| 8-UN      | 2B         |    |     |      |        |
| G         | ISO 5969/X |    |     |      | A5 119 |
| Rp (BSPP) | --         |    |     |      |        |
| Rc (BSPT) | --         |    |     |      |        |
| BSW       | mc         | A4 | 129 |      |        |
| NPT       | --         |    |     |      |        |
| NPTF      | --         |    |     |      |        |
| ISO 513   | Group      |    |     |      |        |
| P         | P.1        | ●  | ●   | ●    | ●      |
|           | P.2        | ●  | ●   | ●    | ●      |
|           | P.3        | ●  | ●   | ●    | ●      |
|           | P.4        | ●  | ●   | ●    | ●      |
|           | P.5        |    |     | ●    |        |
|           | P.6        |    |     |      |        |
|           | P.7        | ●  | ●   | ●    | ●      |
| M         | M.1        | ○  | ○   | ●    | ○      |
|           | M.2        | ○  | ○   | ●    | ○      |
| K         | K.1        | ○  | ○   | ●    | ○      |
|           | K.2        | ●  | ●   | ●    | ●      |
|           | K.3        |    |     | ●    |        |
| N         | N.1        | ●  | ●   | ●    | ●      |
|           | N.2        | ●  | ●   | ●    | ●      |
|           | N.3        | ●  | ●   | ●    | ●      |
|           | N.4        | ○  | ○   | ●    | ○      |
|           | N.5        | ●  | ●   | ●    | ●      |
|           | N.6        | ●  | ●   | ●    | ●      |
|           | N.7        | ●  | ●   | ●    | ●      |
|           | N.8        |    |     | ●    |        |
|           | N.9        |    |     | ●    |        |
|           | N.10       |    |     | ●    |        |
| S         | S.1        | ○  | ○   | ●    | ○      |
|           | S.2        |    |     | ○    |        |
|           | S.3        | ○  | ○   | ●    | ○      |
|           | S.4        |    |     | ○    |        |
| H         | H.1        |    |     |      |        |
|           | H.2        |    |     |      |        |



# TAP APPLICATION TABLE



|          |            |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
|----------|------------|--------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| M        | 4H         |        |       |        | A15 S | 47    |       |       | A15 S | 47    |       |       |       |       |       |
|          | 6H/6HX     |        |       |        | A15 S | 45    | A15 S | 45    | A15 S | 45    | A15 S | 45    |       |       |       |
|          | 6G/6GX     |        |       |        | A15 S | 48    |       |       | A15 S | 48    |       |       |       |       |       |
|          | 7G/7GX     |        |       |        | A15 S | 49    |       |       | A15 S | 49    |       |       |       |       |       |
|          | 6H +0,1    |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
| EG-M     | 6H MOD     |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
| MF       | 6H/6HX     |        |       |        | A17 S | 86    | A17 S | 86    | A17 S | 86    | A17 S | 86    | A17 S | 89    |       |
|          | 6G/6GX     |        |       |        | A17 S | 90    |       |       | A17 S | 90    |       |       |       |       |       |
| UNC      | 2B/2BX     | A27 FP | 102   | A27 FP | 102   | A19 S | 104   |       |       | A19 S | 104   | A19 S | 104   | A19 S | 105   |
|          | 3B         |        |       |        |       | A19 S | 104   |       |       |       |       |       |       |       |       |
| UNF      | 2B/2BX     | A28 FP | 110   | A28 FP | 110   | A20 S | 112   |       |       | A20 S | 112   | A20 S | 112   | A20 S | 113   |
|          | 3B         |        |       |        |       | A20 S | 112   |       |       |       |       |       |       |       |       |
| 8-UN     | 2B         |        |       |        |       | A119  | 117   |       |       | A119  | 117   |       |       |       |       |
| G        | ISO 5969/X | A26 FP | 120   |        |       | A18 S | 122   | A18 S | 122   |       |       | A18 S | 122   | A18 S | 122   |
| Rp(BSPP) | --         |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
| Rc(BSPT) | --         |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
| BSW      | mc         | A24 FP | 130   |        |       |       |       |       |       |       |       |       |       |       |       |
| NPT      | --         |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
| NPTF     | --         |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
| ISO 513  | Group      |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
| P        | P.1        | ○      | 12-15 | ●      | 20-25 | ○     | 18-20 | ○     | 18-20 | ○     | 30-35 | ○     | 30-35 |       |       |
|          | P.2        | ●      | 10-12 | ●      | 15-20 | ●     | 20-25 | ●     | 20-25 | ●     | 30-35 | ●     | 30-35 |       |       |
|          | P.3        | ●      | 8-10  | ●      | 12-15 | ●     | 15-20 | ●     | 15-20 | ●     | 25-30 | ●     | 25-30 |       |       |
|          | P.4        |        |       |        |       | ●     | 12-15 | ●     | 12-15 | ●     | 20-25 | ●     | 20-25 |       |       |
|          | P.5        |        |       |        |       | ○     | 3-5   | ○     | 3-5   | ●     | 10-15 | ●     | 10-15 |       |       |
|          | P.6        |        |       |        |       |       |       |       |       | ●     | 8-10  | ●     | 8-10  | ●     | 10-12 |
|          | P.7        |        |       |        |       |       |       |       |       | ●     | 8-10  | ●     | 8-10  | ●     | 10-12 |
| M        | M.1        |        |       |        |       |       |       |       |       | ●     | 8-10  | ●     | 8-10  | ●     | 10-12 |
|          | M.2        |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
| K        | K.1        |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
|          | K.2        | ●      | 8-10  | ●      | 12-15 | ●     | 15-20 | ●     | 15-20 | ●     | 25-30 | ●     | 25-30 |       |       |
|          | K.3        |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
| N        | N.1        | ○      | 12-15 | ●      | 20-25 | ○     | 18-20 | ○     | 18-20 | ○     | 30-35 | ○     | 30-35 |       |       |
|          | N.2        | ○      | 10-12 | ○      | 15-20 | ●     | 20-25 | ●     | 20-25 | ●     | 30-35 | ●     | 30-35 |       |       |
|          | N.3        | ○      | 10-12 | ○      | 15-20 | ●     | 20-25 | ●     | 20-25 | ●     | 30-35 | ●     | 30-35 |       |       |
|          | N.4        |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
|          | N.5        | ○      | 10-12 | ●      | 15-20 | ○     | 15-18 | ○     | 15-18 | ○     | 25-30 | ○     | 25-30 |       |       |
|          | N.6        | ○      | 8-10  | ○      | 12-15 | ●     | 15-18 | ●     | 15-18 | ●     | 25-30 | ●     | 25-30 |       |       |
|          | N.7        |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
|          | N.8        |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
|          | N.9        |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
|          | N.10       |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
| S        | S.1        |        |       |        |       | ○     | 8-10  | ○     | 8-10  |       |       |       |       |       |       |
|          | S.2        |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
|          | S.3        |        |       |        |       | ○     | 8-10  | ○     | 8-10  | ○     | 12-15 | ○     | 12-15 |       |       |
|          | S.4        |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
| H        | H.1        |        |       |        |       |       |       |       |       |       |       |       |       |       |       |
|          | H.2        |        |       |        |       |       |       |       |       |       |       |       |       |       |       |

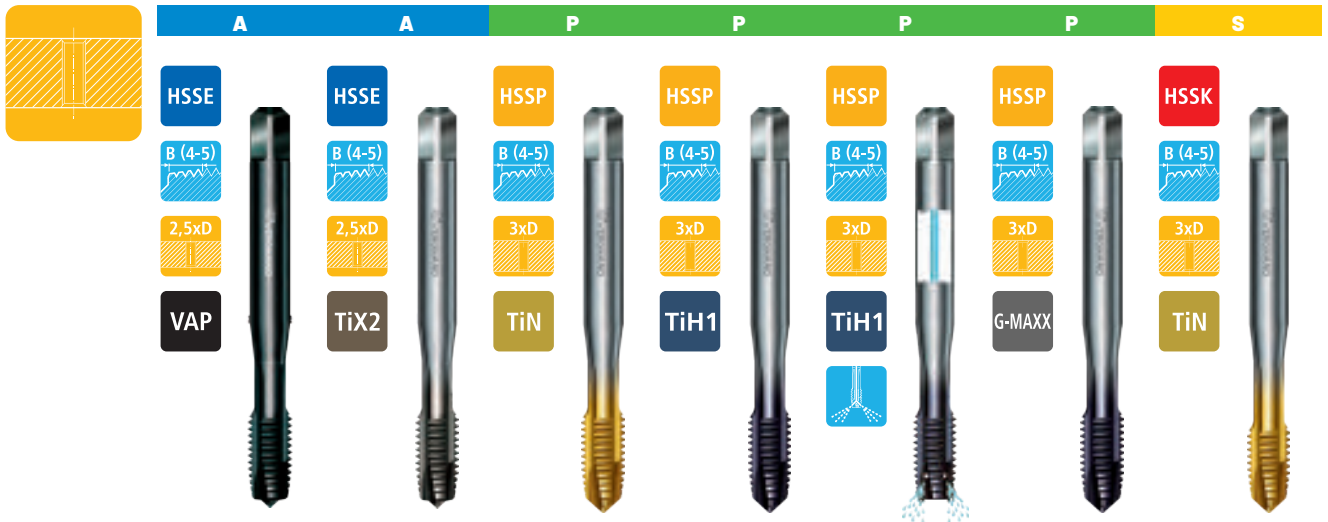
## TAP APPLICATION TABLE

| A       | A       | A       | A       | A       | A       | A       | A       | A       |
|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| HSSE    | HSSE    | HSSE    | HSSE    | HSSE    | HSSE    | HSSE    | HSSE    | HSSE    |
| B (4-5) | B (4-5) | B (4-5) | B (4-5) | B (4-5) | B (4-5) | B (4-5) | B (4-5) | B (4-5) |
| 2,5xD   | 2,5xD   | 2,5xD   | 2,5xD   | 2,5xD   | 2,5xD   | 2,5xD   | 2,5xD   | 2,5xD   |
| BRIGHT  | TiN     | BRIGHT  | TiN     | BRIGHT  | TiH1    | BRIGHT  | BRIGHT  | TiN     |

[illegible]

|         |         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|---------|
| ○ 18-20 | ○ 30-35 | ○ 18-20 | ○ 30-35 | ● 18-20 | ● 30-35 | ● 18-20 | ● 30-35 |
| ● 20-25 | ● 30-35 | ● 20-25 | ● 30-35 |         |         | ● 15-18 | ● 25-30 |
| ● 15-20 | ● 25-30 | ● 15-20 | ● 25-30 |         |         | ● 12-15 | ● 20-25 |
| ● 12-15 | ● 20-25 | ● 12-15 | ● 20-25 |         |         | ○ 10-12 | ○ 15-20 |
| ○ 3-5   | ● 10-15 | ○ 3-5   | ● 10-15 |         |         |         |         |
|         |         |         |         |         |         |         |         |
|         | ● 8-10  |         | ● 8-10  |         |         |         | ○ 6-8   |
|         | ● 8-10  |         | ● 8-10  |         |         |         | ○ 6-8   |
|         |         |         |         |         |         |         |         |
| ● 15-20 | ● 25-30 | ● 15-20 | ● 25-30 |         |         | ○ 12-15 | ○ 20-25 |
|         |         |         |         |         |         |         |         |
| ○ 18-20 | ○ 30-35 | ○ 18-20 | ○ 30-35 | ● 18-20 | ● 30-40 | ● 18-20 | ○ 30-35 |
| ● 20-25 | ● 30-35 | ● 20-25 | ● 30-35 | ● 15-18 | ● 30-40 | ● 15-18 | ● 25-30 |
| ● 20-25 | ● 30-35 | ● 20-25 | ● 30-35 |         |         | ○ 15-18 | ○ 25-30 |
|         |         |         |         |         |         |         |         |
| ○ 15-18 | ○ 25-30 | ○ 15-18 | ○ 25-30 | ● 15-18 | ● 30-35 | ● 15-18 | ○ 25-30 |
| ● 15-18 | ● 25-30 | ● 15-18 | ● 25-30 | ● 12-15 | ● 30-35 | ● 12-15 | ● 20-25 |
|         |         |         |         |         |         |         |         |
|         |         |         |         |         |         |         |         |
|         |         |         |         |         |         |         |         |
| ○ 8-10  |         | ○ 8-10  |         | ○ 6-8   |         | ○ 6-8   |         |
|         |         |         |         |         |         |         |         |
| ○ 8-10  | ○ 12-15 | ○ 8-10  | ○ 12-15 | ○ 6-8   |         | ○ 8-10  |         |
|         |         |         |         |         |         |         |         |

# TAP APPLICATION TABLE



|          |            | A    |       | A    |       | P   |       | P   |       | P    |       | P    |       | S   |       |
|----------|------------|------|-------|------|-------|-----|-------|-----|-------|------|-------|------|-------|-----|-------|
| M        | 4H         |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
|          | 6H/6HX     | A150 | 54    | A150 | 54    | P15 | 140   | P15 | 140   | BP15 | 140   | P150 | 141   | S15 | 187   |
|          | 6G/6GX     |      |       |      |       |     |       | P15 | 140   |      |       |      |       |     |       |
|          | 7G/7GX     |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
|          | 6H +0,1    |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
| EG-M     | 6H MOD     |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
| MF       | 6H/6HX     |      |       |      |       | P17 | 159   | P17 | 174   | BP17 | 159   | P151 | 160   | S17 | 191   |
|          | 6G/6GX     |      |       |      |       |     |       | P17 | 174   |      |       |      |       |     |       |
| UNC      | 2B/2BX     |      |       |      |       |     |       | P19 | 171   |      |       |      |       |     |       |
|          | 3B         |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
| UNF      | 2B/2BX     |      |       |      |       |     |       | P20 | 175   |      |       |      |       |     |       |
|          | 3B         |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
| 8-UN     | 2B         |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
| G        | ISO 5969/X |      |       |      |       | P18 | 177   | P18 | 177   |      |       |      |       |     |       |
| Rp(BSPP) | --         |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
| Rc(BSPT) | --         |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
| BSW      | mc         |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
| NPT      | --         |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
| NPTF     | --         |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
| ISO 513  | Group      |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
| P        | P.1        |      |       |      |       |     |       |     |       |      |       |      |       | ●   | 50-60 |
|          | P.2        |      |       |      |       | ○   | 30-40 | ○   | 30-40 | ○    | 30-40 |      |       | ●   | 50-60 |
|          | P.3        |      |       |      |       | ●   | 25-35 | ●   | 25-35 | ●    | 25-30 |      |       | ●   | 45-55 |
|          | P.4        |      |       |      |       | ●   | 20-30 | ●   | 20-30 | ●    | 20-30 |      |       | ●   | 40-50 |
|          | P.5        |      |       |      |       | ●   | 10-20 | ●   | 10-20 | ●    | 10-20 |      |       | ●   | 15-25 |
|          | P.6        |      |       |      |       | ●   | 8-10  | ●   | 8-10  | ●    | 8-10  |      |       |     |       |
|          | P.7        | ●    | 10-12 | ●    | 10-15 | ●   | 10-15 | ●   | 10-15 | ●    | 10-15 | ●    | 15-20 | ●   | 15-25 |
| M        | M.1        | ●    | 10-12 | ●    | 10-15 | ●   | 10-15 | ●   | 10-15 | ●    | 10-15 | ●    | 15-20 | ●   | 15-25 |
|          | M.2        |      |       | ○    | 8-10  | ●   | 6-8   | ●   | 6-8   | ●    | 6-8   | ●    | 10-12 | ●   | 10-20 |
| K        | K.1        |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
|          | K.2        |      |       |      |       | ●   | 25-35 | ●   | 25-35 | ●    | 25-35 |      |       | ●   | 45-55 |
|          | K.3        |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
| N        | N.1        |      |       |      |       |     |       |     |       |      |       |      |       | ●   | 50-60 |
|          | N.2        |      |       |      |       | ●   | 30-40 | ●   | 30-40 | ●    | 30-40 |      |       | ●   | 45-55 |
|          | N.3        |      |       |      |       | ●   | 30-40 | ●   | 30-40 | ●    | 30-40 |      |       | ●   | 45-55 |
|          | N.4        |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
|          | N.5        |      |       |      |       |     |       |     |       |      |       |      |       | ●   | 40-50 |
|          | N.6        |      |       |      |       | ●   | 25-30 | ●   | 25-30 | ●    | 25-30 |      |       | ●   | 35-45 |
|          | N.7        |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
|          | N.8        |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
|          | N.9        |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
|          | N.10       |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
| S        | S.1        |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
|          | S.2        |      |       |      |       |     |       | ○   | 12-18 | ○    | 12-18 |      |       |     |       |
|          | S.3        |      |       |      |       |     |       |     |       |      |       |      |       | ●   | 15-25 |
|          | S.4        |      |       |      |       | ○   | 12-18 | ○   | 12-18 | ○    | 12-18 |      |       | ○   | 10-20 |
| H        | H.1        |      |       |      |       |     |       |     |       |      |       |      |       |     |       |
|          | H.2        |      |       |      |       |     |       |     |       |      |       |      |       |     |       |

# TAP APPLICATION TABLE



|     |     |      |     |
|-----|-----|------|-----|
| S15 | 187 | BS15 | 187 |
|     |     |      |     |
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|---------|---------|
| ● 50-60 | ● 50-60 |
| ● 50-60 | ● 50-60 |
| ● 45-55 | ● 45-55 |
| ● 40-50 | ● 40-50 |
| ● 15-25 | ● 15-25 |
| ● 15-25 | ● 15-25 |
| ● 15-25 | ● 15-25 |
| ● 10-20 | ● 10-20 |
| ● 45-55 | ● 45-55 |
| ● 50-60 | ● 50-60 |
| ● 45-55 | ● 45-55 |
| ● 45-55 | ● 45-55 |
| ● 40-50 | ● 40-50 |
| ● 35-45 | ● 35-45 |
| ● 15-25 | ● 15-25 |
| ○ 10-20 | ○ 10-20 |
| ● 15-25 | ● 15-25 |
| ○ 10-20 | ○ 10-20 |



|        |    |  |        |    |        |    |        |    |
|--------|----|--|--------|----|--------|----|--------|----|
| A21 FC | 38 |  | A21 FC | 38 | A22 FC | 40 | A22 FC | 40 |
|        |    |  |        |    |        |    |        |    |
|        |    |  |        |    |        |    |        |    |

|        |    |           |    |        |    |  |  |  |
|--------|----|-----------|----|--------|----|--|--|--|
| A190   | 76 |           |    |        |    |  |  |  |
| A23 FC | 82 | A23 FC LH | 82 | A23 FC | 82 |  |  |  |

|        |     |  |        |     |  |  |  |  |
|--------|-----|--|--------|-----|--|--|--|--|
| A27 FC | 102 |  | A27 FC | 102 |  |  |  |  |
|--------|-----|--|--------|-----|--|--|--|--|

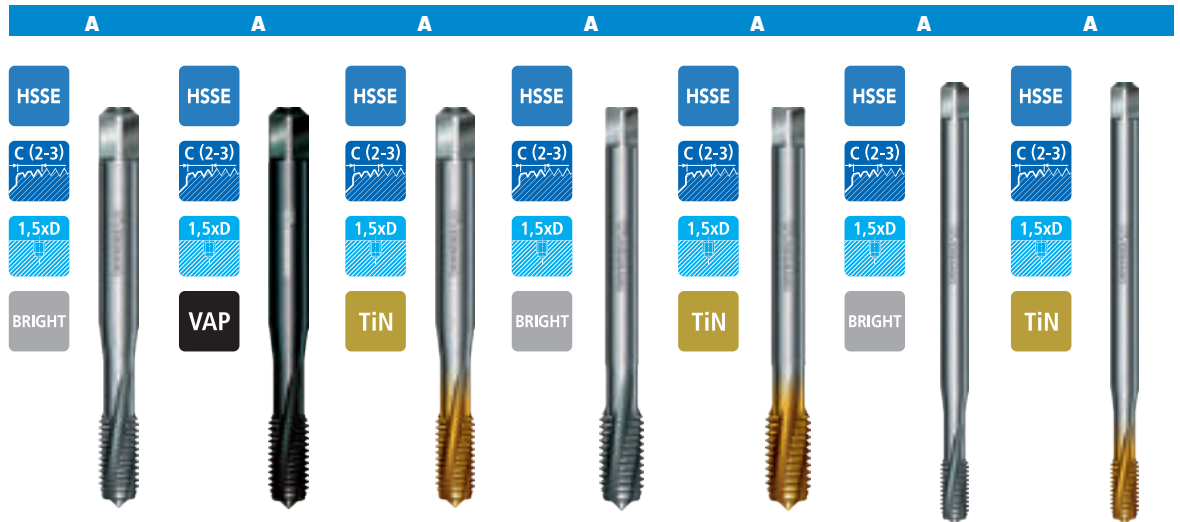
|        |     |  |        |     |  |  |  |  |
|--------|-----|--|--------|-----|--|--|--|--|
| A28 FC | 110 |  | A28 FC | 110 |  |  |  |  |
|        |     |  |        |     |  |  |  |  |

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|--------|-----|--|--|--|--|--|--|--|
| A26 FC | 120 |  |  |  |  |  |  |  |
|--------|-----|--|--|--|--|--|--|--|

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|        |     |  |  |  |  |  |  |  |
| A24 FC | 130 |  |  |  |  |  |  |  |

|         |         |         |         |         |
|---------|---------|---------|---------|---------|
| ○ 12-15 | ○ 12-15 | ● 20-25 | ○ 12-15 | ● 20-25 |
| ● 10-12 | ● 10-12 | ● 15-20 | ● 10-12 | ● 15-20 |
| ● 8-10  | ● 8-10  | ● 12-15 | ● 8-10  | ● 12-15 |
|         |         |         |         |         |
|         |         |         |         |         |
|         |         |         |         |         |
|         |         |         |         |         |
| ● 8-10  | ● 8-10  | ● 12-15 | ● 8-10  | ● 12-15 |
| ○ 12-15 | ○ 12-15 | ● 20-25 | ○ 12-15 | ● 20-25 |
| ○ 10-12 | ○ 10-12 | ○ 15-20 | ○ 10-12 | ○ 15-20 |
| ○ 10-12 | ○ 10-12 | ○ 15-20 | ○ 10-12 | ○ 15-20 |
| ○ 10-12 | ○ 10-12 | ● 15-20 | ○ 10-12 | ● 15-20 |
| ○ 8-10  | ○ 8-10  | ○ 12-15 | ○ 8-10  | ○ 12-15 |
|         |         |         |         |         |
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# TAP APPLICATION TABLE



|          |            |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
|----------|------------|-----|-------|-----|-------|-----|-------|---------|-------|---------|-------|-------|-------|-------|-------|
| M        | 4H         |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
|          | 6H/6HX     | A29 | 55    | A29 | 55    | A29 | 55    | A29 376 | 58    | A29 376 | 58    | A29 L | 59    | A29 L | 59    |
|          | 6G/6GX     | A29 | 57    |     |       | A29 | 57    |         |       |         |       |       |       |       |       |
|          | 7G/7GX     |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
|          | 6H +0,1    |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
| EG-M     | 6H MOD     |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
| MF       | 6H/6HX     | A30 | 91    |     |       | A30 | 91    |         |       |         |       |       |       |       |       |
|          | 6G/6GX     |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
| UNC      | 2B/2BX     | A33 | 106   |     |       |     |       | A33     | 106   |         |       |       |       |       |       |
|          | 3B         | A33 | 106   |     |       |     |       |         |       |         |       |       |       |       |       |
| UNF      | 2B/2BX     | A34 | 114   |     |       | A34 | 114   |         |       |         |       |       |       |       |       |
|          | 3B         | A34 | 114   |     |       |     |       |         |       |         |       |       |       |       |       |
| 8-UN     | 2B         |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
| G        | ISO 5969/X | A32 | 123   |     |       | A32 | 123   |         |       |         |       |       |       |       |       |
| Rp(BSPP) | --         |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
| Rc(BSPT) | --         |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
| BSW      | mc         | A31 | 131   |     |       |     |       | A31     | 131   |         |       |       |       |       |       |
| NPT      | --         |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
| NPTF     | --         |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
| ISO 513  | Group      |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
| P        | P.1        | ●   | 18-20 | ●   | 18-20 | ●   | 30-35 | ●       | 18-20 | ●       | 30-35 | ●     | 18-20 | ●     | 30-35 |
|          | P.2        | ●   | 15-18 | ●   | 15-18 | ●   | 25-30 | ●       | 15-18 | ●       | 25-30 | ●     | 15-18 | ●     | 25-30 |
|          | P.3        | ●   | 12-15 | ●   | 12-15 | ●   | 20-25 | ●       | 12-15 | ●       | 20-25 | ●     | 12-15 | ●     | 20-25 |
|          | P.4        | ●   | 10-12 | ●   | 10-12 | ●   | 15-20 | ●       | 10-12 | ●       | 15-20 | ●     | 10-12 | ●     | 15-20 |
|          | P.5        |     |       |     |       | ●   | 5-10  |         |       | ●       | 5-10  |       |       | ●     | 5-10  |
|          | P.6        |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
|          | P.7        |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
| M        | M.1        |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
|          | M.2        |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
| K        | K.1        |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
|          | K.2        | ●   | 12-15 | ●   | 12-15 | ●   | 20-25 | ●       | 12-15 | ●       | 20-25 | ●     | 12-15 | ●     | 20-25 |
|          | K.3        |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
| N        | N.1        | ●   | 18-20 | ●   | 18-20 | ○   | 30-35 | ●       | 18-20 | ○       | 30-35 | ●     | 18-20 | ○     | 30-35 |
|          | N.2        | ●   | 15-18 | ●   | 15-18 | ●   | 25-30 | ●       | 15-18 | ●       | 25-30 | ●     | 15-18 | ●     | 25-30 |
|          | N.3        | ●   | 15-18 | ●   | 15-18 | ●   | 25-30 | ●       | 15-18 | ●       | 25-30 | ●     | 15-18 | ●     | 25-30 |
|          | N.4        |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
|          | N.5        | ●   | 15-18 | ●   | 15-18 | ○   | 25-30 | ●       | 15-18 | ○       | 25-30 | ●     | 15-18 | ○     | 25-30 |
|          | N.6        | ●   | 12-15 | ●   | 12-15 | ●   | 20-25 | ●       | 12-15 | ●       | 20-25 | ●     | 12-15 | ●     | 20-25 |
|          | N.7        |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
|          | N.8        |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
|          | N.9        |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
|          | N.10       |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
| S        | S.1        | ○   | 6-8   | ○   | 6-8   |     |       | ○       | 6-8   |         |       | ○     | 6-8   |       |       |
|          | S.2        |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
|          | S.3        | ○   | 6-8   | ○   | 6-8   | ○   | 8-10  | ○       | 6-8   | ○       | 8-10  | ○     | 6-8   | ○     | 8-10  |
|          | S.4        |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
| H        | H.1        |     |       |     |       |     |       |         |       |         |       |       |       |       |       |
|          | H.2        |     |       |     |       |     |       |         |       |         |       |       |       |       |       |

## TAP APPLICATION TABLE

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|         |         |         |         |       |         |         |         |
|---------|---------|---------|---------|-------|---------|---------|---------|
|         |         |         |         |       |         |         |         |
| ● 15-20 | ● 15-20 | ● 25-30 | ● 25-30 |       | ● 15-20 | ● 25-30 | ● 15-20 |
| ● 12-15 | ● 12-15 | ● 20-25 | ● 20-25 |       | ● 12-15 | ● 20-25 | ● 12-15 |
| ● 10-12 | ● 10-12 | ● 15-20 | ● 15-20 |       | ● 10-12 | ● 15-20 | ● 10-12 |
| ○ 6-8   | ○ 6-8   | ● 5-10  | ● 5-10  |       | ○ 6-8   | ● 5-10  | ○ 6-8   |
|         |         |         |         |       |         |         |         |
|         |         | ● 6-8   | ● 6-8   | ● 6-8 |         | ● 6-8   |         |
|         |         | ● 6-8   | ● 6-8   | ● 6-8 |         | ● 6-8   |         |
|         |         |         |         |       |         |         |         |
| ● 12-15 | ● 12-15 | ● 20-25 | ● 20-25 |       | ● 12-15 | ● 20-25 | ● 12-15 |
|         |         |         |         |       |         |         |         |
| ○ 18-20 | ○ 18-20 | ○ 30-35 | ○ 30-35 |       | ○ 18-20 | ○ 30-35 | ○ 18-20 |
| ● 15-18 | ● 15-18 | ● 25-30 | ● 25-30 |       | ● 15-18 | ● 25-30 | ● 15-18 |
|         |         |         |         |       |         |         |         |
| ● 15-18 | ● 15-18 | ● 25-30 | ● 25-30 |       | ● 15-18 | ● 25-30 | ● 15-18 |
|         |         |         |         |       |         |         |         |
|         |         |         |         |       |         |         |         |
|         |         |         |         |       |         |         |         |
| ○ 6-8   | ○ 6-8   |         |         |       | ○ 6-8   |         | ○ 6-8   |
| ○ 6-8   | ○ 6-8   | ○ 8-10  | ○ 8-10  |       | ○ 6-8   | ○ 8-10  | ○ 6-8   |
|         |         |         |         |       |         |         |         |

# TAP APPLICATION TABLE

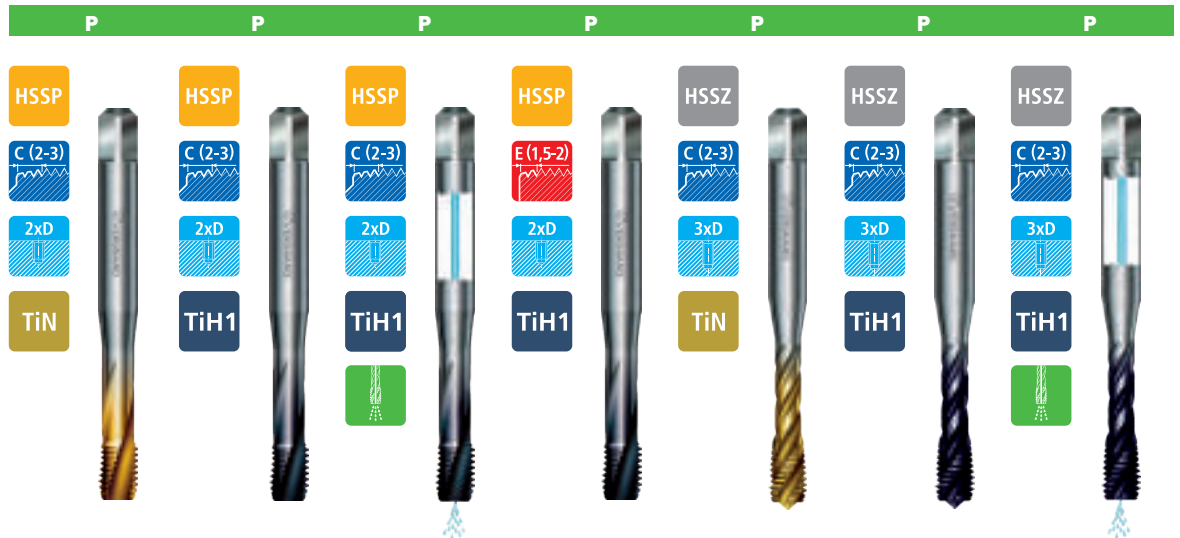


|          |            |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|----------|------------|----------|---------|---------|---------|---------|---------|---------|---------|---------|---------|------|----|------|----|
| M        | 4H         |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|          | 6H/6HX     | A70 S LH | 66      | A76 S   | 67      | A76 S   | 67      | A70 L   | 68      | A70 L   | 68      | A120 | 69 | A120 | 69 |
|          | 6G/6GX     |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|          | 7G/7GX     |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|          | 6H +0,1    |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| EG-M     | 6H MOD     |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| MF       | 6H/6HX     |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|          | 6G/6GX     |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| UNC      | 2B/2BX     |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|          | 3B         |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| UNF      | 2B/2BX     |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|          | 3B         |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| 8-UN     | 2B         |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| G        | ISO 5969/X |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| Rp(BSPP) | --         |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| Rc(BSPT) | --         |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| BSW      | mc         |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| NPT      | --         |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| NPTF     | --         |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| ISO 513  | Group      |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| P        | P.1        |          |         |         |         |         |         | ● 12-15 | ● 25-30 | ● 12-15 | ● 12-15 |      |    |      |    |
|          | P.2        | ● 25-30  | ● 15-20 | ● 25-30 | ● 10-15 | ● 20-25 | ● 10-15 | ● 10-15 |         |         |         |      |    |      |    |
|          | P.3        | ● 20-25  | ● 12-15 | ● 20-25 | ○ 8-10  | ○ 15-20 | ○ 8-10  | ○ 8-10  |         |         |         |      |    |      |    |
|          | P.4        | ● 15-20  | ● 10-12 | ● 15-20 |         |         |         |         |         |         |         |      |    |      |    |
|          | P.5        | ● 5-10   | ○ 6-8   | ● 5-10  |         |         |         |         |         |         |         |      |    |      |    |
|          | P.6        |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|          | P.7        | ● 6-8    |         |         | ● 6-8   |         |         |         |         |         |         |      |    |      |    |
| M        | M.1        | ● 6-8    |         |         | ● 6-8   |         |         |         |         |         |         |      |    |      |    |
|          | M.2        |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| K        | K.1        |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|          | K.2        | ● 20-25  | ● 12-15 | ● 20-25 | ○ 8-10  | ○ 15-20 | ○ 8-10  | ○ 8-10  |         |         |         |      |    |      |    |
|          | K.3        |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| N        | N.1        |          |         |         |         |         |         | ● 12-15 | ○ 25-30 | ● 12-15 | ● 12-15 |      |    |      |    |
|          | N.2        | ○ 30-35  | ○ 18-20 | ○ 30-35 | ● 12-15 | ● 25-30 | ● 12-15 | ● 12-15 |         |         |         |      |    |      |    |
|          | N.3        | ● 25-30  | ● 15-18 | ● 25-30 | ○ 10-12 | ○ 20-25 | ○ 10-12 | ○ 10-12 |         |         |         |      |    |      |    |
|          | N.4        |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|          | N.5        |          |         |         |         |         |         | ● 10-12 | ○ 20-25 | ● 10-12 | ● 10-12 |      |    |      |    |
|          | N.6        | ● 25-30  | ● 15-18 | ● 25-30 | ● 10-12 | ● 20-25 | ● 10-12 | ● 10-12 |         |         |         |      |    |      |    |
|          | N.7        |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|          | N.8        |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|          | N.9        |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|          | N.10       |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| S        | S.1        |          |         | ○ 6-8   |         |         |         |         |         |         |         |      |    |      |    |
|          | S.2        |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|          | S.3        | ○ 8-10   | ○ 6-8   | ○ 8-10  |         |         |         |         |         |         |         |      |    |      |    |
|          | S.4        |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
| H        | H.1        |          |         |         |         |         |         |         |         |         |         |      |    |      |    |
|          | H.2        |          |         |         |         |         |         |         |         |         |         |      |    |      |    |

## TAP APPLICATION TABLE

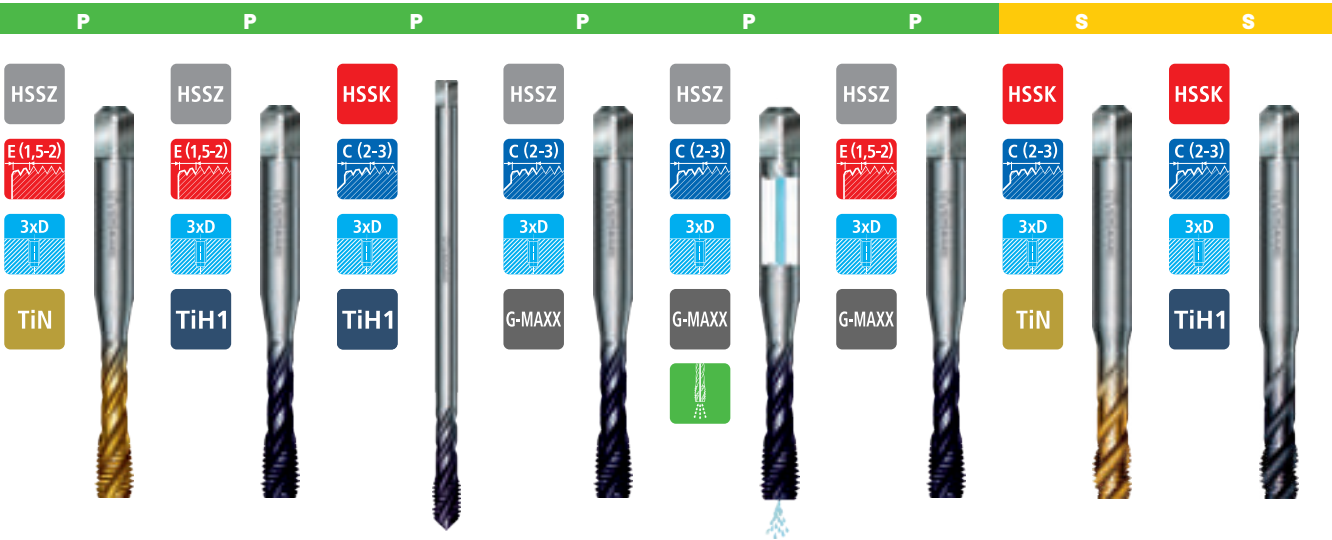
[illegible]

# TAP APPLICATION TABLE



|          |            | P       |     | P       |     | P       |     | P       |     | P       |     | P       |     | P       |     |
|----------|------------|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|
|          |            | HSSP    |     | HSSP    |     | HSSP    |     | HSSP    |     | HSSZ    |     | HSSZ    |     | HSSZ    |     |
| M        | 4H         |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
|          | 6H/6HX     | P29     | 142 | P29     | 142 | BP29    | 142 | P29 E   | 143 | P70     | 144 | P70     | 144 | BP70    | 145 |
|          | 6G/6GX     |         |     |         |     |         |     |         |     |         |     | P70     | 144 |         |     |
|          | 7G/7GX     |         |     |         |     |         |     |         |     |         |     | P70     | 144 |         |     |
|          | 6H +0,1    |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
| EG-M     | 6H MOD     |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
| MF       | 6H/6HX     | P30     | 161 | P30     | 161 | BP30    | 161 | P30 E   | 162 | P71     | 163 | P71     | 163 | BP71    | 163 |
|          | 6G/6GX     |         |     |         |     |         |     |         |     |         |     | P71     | 163 |         |     |
| UNC      | 2B/2BX     |         |     |         |     |         |     |         |     |         |     | P60     | 172 |         |     |
| UNF      | 3B         |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
|          | 2B/2BX     |         |     |         |     |         |     |         |     |         |     | P61     | 175 |         |     |
| 8-UN     | 3B         |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
|          | 2B         |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
| G        | ISO 5969/X |         |     |         |     |         |     |         |     | P59     | 178 | P59     | 178 | BP59    | 178 |
| Rp(BSPP) | --         |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
| Rc(BSPT) | --         |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
| BSW      | mc         |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
| NPT      | --         |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
| NPTF     | --         |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
| ISO 513  | Group      |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
| P        | P.1        |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
|          | P.2        |         |     |         |     |         |     |         |     | ○ 25-35 |     | ○ 25-35 |     | ○ 25-35 |     |
|          | P.3        | ● 25-30 |     | ● 25-30 |     | ● 25-30 |     | ● 25-30 |     | ● 20-30 |     | ● 20-30 |     | ● 20-30 |     |
|          | P.4        | ● 20-25 |     | ● 20-25 |     | ● 20-25 |     | ● 20-25 |     | ● 15-25 |     | ● 15-25 |     | ● 15-25 |     |
|          | P.5        | ● 10-15 |     | ● 10-15 |     | ● 10-15 |     | ● 10-15 |     | ● 5-15  |     | ● 5-15  |     | ● 5-15  |     |
|          | P.6        | ● 5-10  |     | ● 5-10  |     | ● 5-10  |     | ● 5-10  |     | ○ 5-8   |     | ○ 5-8   |     | ○ 5-8   |     |
|          | P.7        | ● 10-15 |     | ● 10-15 |     | ● 10-15 |     | ● 10-15 |     | ● 8-10  |     | ● 8-10  |     | ● 8-10  |     |
| M        | M.1        |         |     |         |     |         |     |         |     | ● 8-10  |     | ● 8-10  |     | ● 8-10  |     |
|          | M.2        |         |     |         |     |         |     |         |     | ● 5-7   |     | ● 5-7   |     | ● 5-7   |     |
| K        | K.1        |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
|          | K.2        | ● 25-30 |     | ● 25-30 |     | ● 25-30 |     | ● 25-30 |     | ● 20-30 |     | ● 20-30 |     | ● 20-30 |     |
|          | K.3        |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
| N        | N.1        |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
|          | N.2        |         |     |         |     |         |     |         |     | ○ 30-40 |     | ○ 30-40 |     | ○ 30-40 |     |
|          | N.3        | ● 25-30 |     | ● 25-30 |     | ● 25-30 |     | ● 25-30 |     | ● 25-35 |     | ● 25-35 |     | ● 25-35 |     |
|          | N.4        |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
|          | N.5        |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
|          | N.6        | ● 25-30 |     | ● 25-30 |     | ● 25-30 |     | ● 25-30 |     | ● 25-35 |     | ● 25-35 |     | ● 25-35 |     |
|          | N.7        | ● 20-25 |     | ● 20-25 |     | ● 20-25 |     | ● 20-25 |     |         |     |         |     |         |     |
|          | N.8        |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
|          | N.9        |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
|          | N.10       |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
| S        | S.1        |         |     |         |     |         |     |         |     |         |     | ● 10-15 |     | ● 10-15 |     |
|          | S.2        |         |     | ● 2-3   |     | ● 2-3   |     | ● 2-3   |     |         |     |         |     |         |     |
|          | S.3        |         |     |         |     |         |     |         |     | ● 10-15 |     | ● 10-15 |     | ● 10-15 |     |
|          | S.4        | ● 2-3   |     | ● 2-3   |     | ● 2-3   |     | ● 2-3   |     |         |     |         |     |         |     |
| H        | H.1        |         |     |         |     |         |     |         |     |         |     |         |     |         |     |
|          | H.2        |         |     |         |     |         |     |         |     |         |     |         |     |         |     |

TAP APPLICATION TABLE



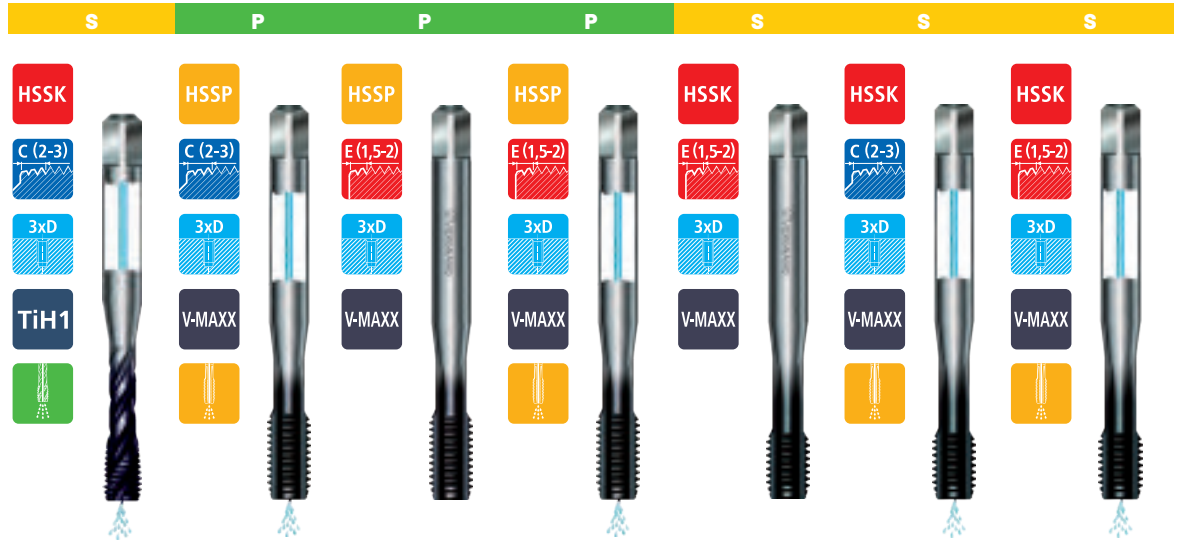
|       |     |       |     |       |     |      |     |       |     |        |     |     |     |     |     |
|-------|-----|-------|-----|-------|-----|------|-----|-------|-----|--------|-----|-----|-----|-----|-----|
| P70 E | 146 | P70 E | 146 | P76 L | 147 | P170 | 148 | BP170 | 148 | P170 E | 148 | S70 | 188 | S70 | 188 |
|       |     | P70 E | 146 |       |     |      |     |       |     |        |     |     |     |     |     |
|       |     |       |     |       |     |      |     |       |     |        |     |     |     |     |     |
|       |     | P71 E | 164 |       |     | P171 | 165 |       |     |        |     | S71 | 192 |     |     |
|       |     | P71 E | 164 |       |     |      |     |       |     |        |     |     |     |     |     |

|  |  |       |     |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|-------|-----|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |       |     |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |       |     |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | P59 E | 179 |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |       |     |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |       |     |  |  |  |  |  |  |  |  |  |  |  |  |

|         |         |         |         |         |         |         |         |
|---------|---------|---------|---------|---------|---------|---------|---------|
| ○ 25-35 | ○ 25-35 | ○ 25-35 |         |         |         | ● 45-55 | ● 45-55 |
| ● 20-30 | ● 20-30 | ● 20-30 |         |         |         | ● 45-55 | ● 45-55 |
| ● 15-25 | ● 15-25 | ● 15-25 |         |         |         | ● 40-50 | ● 40-50 |
| ● 5-15  | ● 5-15  | ● 5-15  |         |         |         | ● 35-45 | ● 35-45 |
| ○ 5-8   | ○ 5-8   | ○ 5-8   |         |         |         | ● 15-20 | ● 15-20 |
| ● 8-10  | ● 8-10  | ● 8-10  | ● 10-15 | ● 10-15 | ● 10-15 | ● 15-20 | ● 15-20 |
| ● 8-10  | ● 8-10  | ● 8-10  | ● 10-15 | ● 10-15 | ● 10-15 | ● 15-20 | ● 15-20 |
| ● 5-7   | ● 5-7   | ● 5-7   | ● 6-8   | ● 6-8   | ● 6-8   |         |         |
| ● 20-30 | ● 20-30 | ● 20-30 |         |         |         | ● 40-50 | ● 40-50 |
|         |         |         |         |         |         |         |         |
| ○ 30-40 | ○ 30-40 | ○ 30-40 |         |         |         | ● 45-55 | ● 45-55 |
| ● 25-35 | ● 25-35 | ● 25-35 |         |         |         | ● 40-50 | ● 40-50 |
|         |         |         |         |         |         | ● 40-50 | ● 40-50 |
|         |         |         |         |         |         | ● 35-45 | ● 35-45 |
| ● 25-35 | ● 25-35 | ● 25-35 |         |         |         | ● 30-40 | ● 30-40 |
|         |         |         |         |         |         |         |         |
|         |         |         |         |         |         |         |         |
|         |         |         |         |         |         |         |         |
|         | ● 10-15 | ● 10-15 |         |         |         |         | ● 15-20 |
| ● 10-15 | ● 10-15 | ● 10-15 |         |         |         |         | ○ 5-15  |
|         |         |         |         |         |         | ● 15-20 | ● 15-20 |
|         |         |         |         |         |         | ○ 5-15  | ○ 5-15  |
|         |         |         |         |         |         |         |         |



# TAP APPLICATION TABLE



|          |            | S    |       | P    |       | P     |       | S      |       | S     |       | S    |       |
|----------|------------|------|-------|------|-------|-------|-------|--------|-------|-------|-------|------|-------|
|          |            | HSSK |       | HSSP |       | HSSP  |       | HSSK   |       | HSSK  |       | HSSK |       |
| M        | 4H         |      |       |      |       |       |       |        |       |       |       |      |       |
|          | 6H/6HX     | BS70 | 188   | BP43 | 138   | P43 E | 138   | BP43 E | 138   | S43 E | 186   | BS43 | 186   |
|          | 6G/6GX     |      |       |      |       |       |       |        |       |       |       |      |       |
|          | 7G/7GX     |      |       |      |       |       |       |        |       |       |       |      |       |
|          | 6H +0,1    |      |       |      |       |       |       |        |       |       |       |      |       |
| EG-M     | 6H MOD     |      |       |      |       |       |       |        |       |       |       |      |       |
| MF       | 6H/6HX     |      |       | BP45 | 158   | P45 E | 152   | BP45 E | 158   |       |       | BS45 | 190   |
|          | 6G/6GX     |      |       |      |       |       |       |        |       |       |       |      |       |
| UNC      | 2B/2BX     |      |       |      |       |       |       |        |       |       |       |      |       |
| UNF      | 3B         |      |       |      |       |       |       |        |       |       |       |      |       |
|          | 2B/2BX     |      |       |      |       |       |       |        |       |       |       |      |       |
| 8-UN     | 3B         |      |       |      |       |       |       |        |       |       |       |      |       |
|          | 2B         |      |       |      |       |       |       |        |       |       |       |      |       |
| G        | ISO 5969/X |      |       |      |       |       |       |        |       |       |       |      |       |
| Rp(BSPP) | --         |      |       |      |       |       |       |        |       |       |       |      |       |
| Rc(BSPT) | --         |      |       |      |       |       |       |        |       |       |       |      |       |
| BSW      | mc         |      |       |      |       |       |       |        |       |       |       |      |       |
| NPT      | --         |      |       |      |       |       |       |        |       |       |       |      |       |
| NPTF     | --         |      |       |      |       |       |       |        |       |       |       |      |       |
| ISO 513  | Group      |      |       |      |       |       |       |        |       |       |       |      |       |
| P        | P.1        | ●    | 45-55 |      |       |       |       |        |       |       |       |      |       |
|          | P.2        | ●    | 45-55 |      |       |       |       |        |       |       |       |      |       |
|          | P.3        | ●    | 40-50 |      |       |       |       |        |       |       |       |      |       |
|          | P.4        | ●    | 35-45 |      |       |       |       |        |       |       |       |      |       |
|          | P.5        | ●    | 15-20 |      |       |       |       |        |       |       |       |      |       |
|          | P.6        |      |       |      |       |       |       |        |       |       |       |      |       |
|          | P.7        | ●    | 15-20 |      |       |       |       |        |       |       |       |      |       |
| M        | M.1        | ●    | 15-20 |      |       |       |       |        |       |       |       |      |       |
|          | M.2        |      |       |      |       |       |       |        |       |       |       |      |       |
| K        | K.1        | ●    | 40-50 | ●    | 40-50 | ●     | 40-50 | ●      | 55-65 | ●     | 55-65 | ●    | 55-65 |
|          | K.2        | ●    | 40-50 |      |       |       |       |        |       |       |       |      |       |
|          | K.3        |      |       | ○    | 10-20 | ○     | 10-20 | ○      | 10-20 | ○     | 20-30 | ○    | 20-30 |
| N        | N.1        | ●    | 45-55 |      |       |       |       |        |       |       |       |      |       |
|          | N.2        | ●    | 40-50 |      |       |       |       |        |       |       |       |      |       |
|          | N.3        | ●    | 40-50 |      |       |       |       |        |       |       |       |      |       |
|          | N.4        |      |       | ●    | 40-50 | ●     | 40-50 | ●      | 40-50 | ●     | 55-65 | ●    | 55-65 |
|          | N.5        | ●    | 35-45 |      |       |       |       |        |       |       |       |      |       |
|          | N.6        | ●    | 30-40 |      |       |       |       |        |       |       |       |      |       |
|          | N.7        |      |       | ●    | 40-50 | ●     | 40-50 | ●      | 40-50 | ●     | 55-65 | ●    | 55-65 |
|          | N.8        |      |       |      |       |       |       |        |       |       |       |      |       |
|          | N.9        |      |       | ●    | 45-55 | ●     | 45-55 | ●      | 45-55 | ●     | 55-65 | ●    | 55-65 |
|          | N.10       |      |       | ●    | 45-55 | ●     | 45-55 | ●      | 45-55 | ●     | 55-65 | ●    | 55-65 |
| S        | S.1        | ●    | 15-20 |      |       |       |       |        |       |       |       |      |       |
|          | S.2        | ○    | 5-15  |      |       |       |       |        |       |       |       |      |       |
|          | S.3        | ●    | 15-20 |      |       |       |       |        |       |       |       |      |       |
|          | S.4        | ○    | 5-15  |      |       |       |       |        |       |       |       |      |       |
| H        | H.1        |      |       |      |       |       |       |        |       |       |       |      |       |
|          | H.2        |      |       |      |       |       |       |        |       |       |       |      |       |

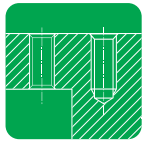
## TAP APPLICATION TABLE

|            |    |            |    |
|------------|----|------------|----|
|            |    |            |    |
| <b>A43</b> | 41 | <b>A43</b> | 41 |
|            |    |            |    |
|            |    |            |    |
|            |    |            |    |

|            |    |            |    |
|------------|----|------------|----|
|            |    |            |    |
| <b>A43</b> | 41 | <b>A43</b> | 41 |
|            |    |            |    |
|            |    |            |    |
|            |    |            |    |

vergnano | 27 

# TAP APPLICATION TABLE

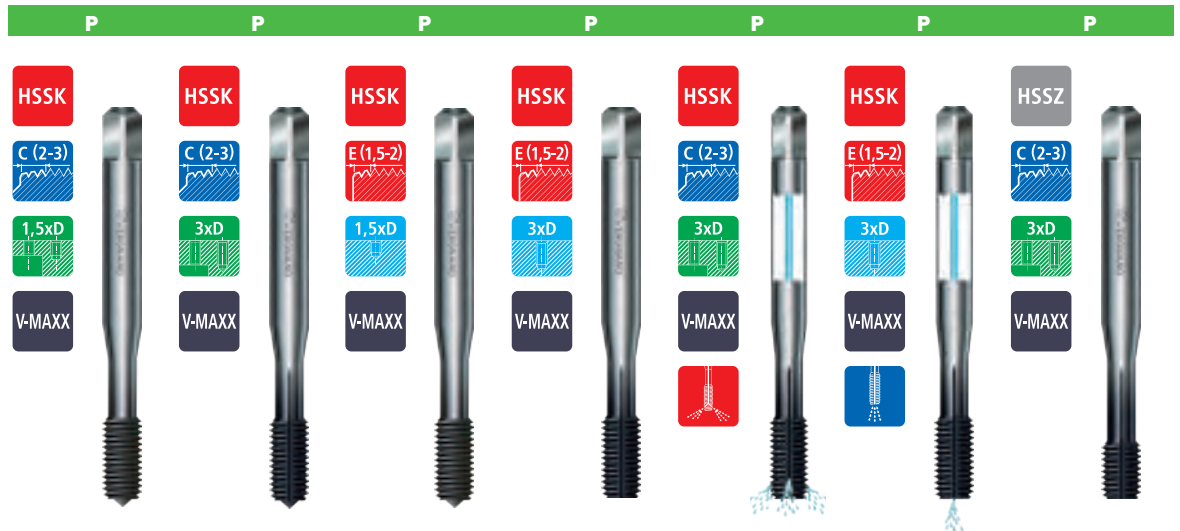


|          |            |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|----------|------------|---------|----|---------|----|---------|----|---------|----|-------|----|---------|----|---------|-----|
| M        | 4H         |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | 6H/6HX     | A44     | 42 | A44     | 42 | A67     | 43 | A67     | 43 | A110  | 44 | A110    | 44 | P43     | 138 |
|          | 6G/6GX     |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | 7G/7GX     |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | 6H +0,1    |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| EG-M     | 6H MOD     |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| MF       | 6H/6HX     |         |    |         |    |         |    |         |    |       |    |         |    | P45     | 158 |
|          | 6G/6GX     |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| UNC      | 2B/2BX     |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| UNF      | 3B         |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | 2B/2BX     |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| 8-UN     | 3B         |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | 2B         |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| G        | ISO 5969/X |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| Rp(BSPP) | --         |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| Rc(BSPT) | --         |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| BSW      | mc         |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| NPT      | --         |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| NPTF     | --         |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| ISO 513  | Group      |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| P        | P.1        |         |    |         |    | ● 12-15 |    | ● 20-25 |    |       |    |         |    |         |     |
|          | P.2        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | P.3        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | P.4        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | P.5        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | P.6        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | P.7        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| M        | M.1        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | M.2        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| K        | K.1        | ● 15-20 |    | ● 40-45 |    |         |    |         |    |       |    |         |    | ● 40-50 |     |
|          | K.2        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | K.3        |         |    |         |    |         |    |         |    |       |    |         |    | ○ 10-20 |     |
| N        | N.1        |         |    |         |    | ● 12-15 |    | ● 20-25 |    |       |    |         |    |         |     |
|          | N.2        |         |    |         |    | ● 10-12 |    | ● 15-20 |    |       |    |         |    |         |     |
|          | N.3        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | N.4        | ● 15-20 |    | ● 40-45 |    |         |    |         |    |       |    |         |    | ● 40-50 |     |
|          | N.5        |         |    |         |    | ● 10-12 |    | ● 15-20 |    |       |    |         |    |         |     |
|          | N.6        |         |    |         |    | ● 8-10  |    | ● 12-15 |    |       |    |         |    |         |     |
|          | N.7        | ● 15-20 |    | ● 40-45 |    |         |    |         |    |       |    |         |    | ● 40-50 |     |
|          | N.8        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | N.9        | ● 20-25 |    | ● 45-50 |    |         |    |         |    |       |    |         |    | ● 45-55 |     |
|          | N.10       | ● 20-25 |    | ● 45-50 |    |         |    |         |    |       |    |         |    | ● 45-55 |     |
| S        | S.1        |         |    |         |    |         |    |         |    | ● 6-8 |    | ● 10-12 |    |         |     |
|          | S.2        |         |    |         |    |         |    |         |    | ● 3-5 |    | ● 6-8   |    |         |     |
|          | S.3        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | S.4        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
| H        | H.1        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |
|          | H.2        |         |    |         |    |         |    |         |    |       |    |         |    |         |     |

# TAP APPLICATION TABLE

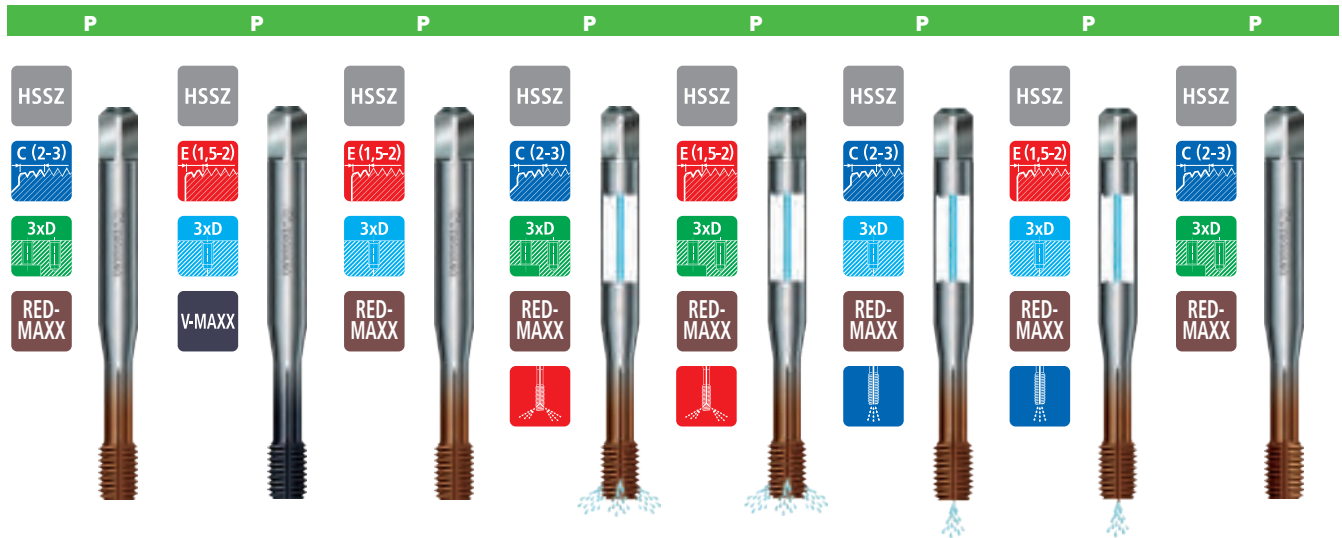
[illegible]

# TAP APPLICATION TABLE



|          |            |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
|----------|------------|-----|-------|-------|-------|-------|-------|--------|--------|---------|-------|---------|-------|--------|--------|-------|
| M        | 4H         |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
|          | 6H/6HX     | P80 | 149   | P80 N | 150   | P80 E | 151   | P80 NE | 151    | BP80 NR | 152   | BP80 NE | 152   | P900 N | 153    |       |
|          | 6G/6GX     | P80 | 149   | P80 N | 150   |       |       |        | P80 NE | 151     |       |         |       |        |        |       |
|          | 7G/7GX     | P80 | 149   | P80 N | 150   |       |       |        |        |         |       |         |       |        |        |       |
|          | 6H +0,1    |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| EG-M     | 6H MOD     |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| MF       | 6H/6HX     | P81 | 166   | P81 N | 167   |       |       |        |        |         |       |         |       |        | P901 N | 168   |
|          | 6G/6GX     | P81 | 166   | P81 N | 167   |       |       |        |        |         |       |         |       |        |        |       |
| UNC      | 2B/2BX     |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
|          | 3B         |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| UNF      | 2B/2BX     |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
|          | 3B         |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| 8-UN     | 2B         |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| G        | ISO 5969/X |     |       | P82N  | 180   |       |       |        |        |         |       |         |       |        | P902 N | 181   |
| Rp(BSPP) | --         |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| Rc(BSPT) | --         |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| BSW      | mc         |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| NPT      | --         |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| NPTF     | --         |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| ISO 513  | Group      |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| P        | P.1        | ●   | 20-25 | ●     | 20-25 | ●     | 20-25 | ●      | 20-25  | ●       | 20-25 | ●       | 20-25 | ●      | 40-45  |       |
|          | P.2        | ●   | 20-25 | ●     | 20-25 | ●     | 20-25 | ●      | 20-25  | ●       | 20-25 | ●       | 20-25 | ●      | 40-45  |       |
|          | P.3        | ●   | 15-20 | ●     | 15-20 | ●     | 15-20 | ●      | 15-20  | ●       | 15-20 | ●       | 15-20 | ●      | 35-40  |       |
|          | P.4        |     |       |       |       |       |       |        |        |         |       |         |       |        | ●      | 30-35 |
|          | P.5        |     |       |       |       |       |       |        |        |         |       |         |       |        | ●      | 15-20 |
|          | P.6        |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
|          | P.7        |     |       |       |       |       |       |        |        |         |       |         |       |        | ●      | 10-15 |
| M        | M.1        |     |       |       |       |       |       |        |        |         |       |         |       |        | ●      | 10-15 |
|          | M.2        |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| K        | K.1        |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
|          | K.2        |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
|          | K.3        |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| N        | N.1        | ●   | 20-25 | ●     | 20-25 | ●     | 20-25 | ●      | 20-25  | ●       | 20-25 | ●       | 20-25 | ●      | 40-45  |       |
|          | N.2        | ●   | 20-25 | ●     | 20-25 | ●     | 20-25 | ●      | 20-25  | ●       | 20-25 | ●       | 20-25 | ●      | 40-45  |       |
|          | N.3        | ●   | 15-20 | ●     | 15-20 | ●     | 15-20 | ●      | 15-20  | ●       | 15-20 | ●       | 15-20 | ●      | 35-40  |       |
|          | N.4        |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
|          | N.5        | ●   | 20-25 | ●     | 20-25 | ●     | 20-25 | ●      | 20-25  | ●       | 20-25 | ●       | 20-25 | ●      | 40-45  |       |
|          | N.6        | ●   | 20-25 | ●     | 20-25 | ●     | 20-25 | ●      | 20-25  | ●       | 20-25 | ●       | 20-25 | ●      | 40-45  |       |
|          | N.7        |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
|          | N.8        |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
|          | N.9        |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
|          | N.10       |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| S        | S.1        |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
|          | S.2        |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
|          | S.3        |     |       |       |       |       |       |        |        |         |       |         |       |        | ●      | 10-15 |
|          | S.4        |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
| H        | H.1        |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |
|          | H.2        |     |       |       |       |       |       |        |        |         |       |         |       |        |        |       |

# TAP APPLICATION TABLE



|        |     |         |     |         |     |           |     |            |     |         |     |          |     |           |     |
|--------|-----|---------|-----|---------|-----|-----------|-----|------------|-----|---------|-----|----------|-----|-----------|-----|
| P900 N | 153 | P900 NE | 154 | P900 NE | 154 | BP900 N R | 155 | BP900 N RE | 155 | BP900 N | 155 | BP900 NE | 155 | P900 N LH | 156 |
| P900 N | 153 |         |     | P900 NE | 154 |           |     |            |     |         |     |          |     |           |     |
| P900 N | 153 |         |     |         |     |           |     |            |     |         |     |          |     |           |     |

|        |     |         |     |         |     |           |     |  |  |  |  |  |  |  |  |
|--------|-----|---------|-----|---------|-----|-----------|-----|--|--|--|--|--|--|--|--|
| P901 N | 168 | P901 NE | 169 | P901 NE | 169 | BP901 N R | 170 |  |  |  |  |  |  |  |  |
| P901 N | 168 |         |     | P901 NE | 169 |           |     |  |  |  |  |  |  |  |  |
|        |     | P903 NE | 173 | P903 NE | 176 |           |     |  |  |  |  |  |  |  |  |

|  |  |         |     |         |     |  |  |  |  |  |  |  |  |  |  |
|--|--|---------|-----|---------|-----|--|--|--|--|--|--|--|--|--|--|
|  |  | P904 NE | 176 | P904 NE | 162 |  |  |  |  |  |  |  |  |  |  |
|  |  |         |     |         |     |  |  |  |  |  |  |  |  |  |  |

|        |     |         |     |         |     |           |     |  |  |  |  |  |  |  |  |
|--------|-----|---------|-----|---------|-----|-----------|-----|--|--|--|--|--|--|--|--|
| P902 N | 181 | P902 NE | 182 | P902 NE | 182 | BP902 N R | 183 |  |  |  |  |  |  |  |  |
|--------|-----|---------|-----|---------|-----|-----------|-----|--|--|--|--|--|--|--|--|

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|   |       |   |       |   |       |   |       |   |       |   |       |   |       |   |       |
|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|
| ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 |
| ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 |
| ● | 35-40 | ● | 35-40 | ● | 35-40 | ● | 35-40 | ● | 35-40 | ● | 35-40 | ● | 35-40 | ● | 35-40 |
| ● | 30-35 | ● | 30-35 | ● | 30-35 | ● | 30-35 | ● | 30-35 | ● | 30-35 | ● | 30-35 | ● | 30-35 |
| ● | 15-20 | ● | 15-20 | ● | 15-20 | ● | 15-20 | ● | 15-20 | ● | 15-20 | ● | 15-20 | ● | 15-20 |

|   |       |   |       |   |       |   |       |   |       |   |       |   |       |   |       |
|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|
| ○ | 10-15 | ● | 10-15 | ○ | 10-15 | ○ | 10-15 | ○ | 10-15 | ○ | 10-15 | ○ | 10-15 | ○ | 10-15 |
| ○ | 10-15 | ● | 10-15 | ○ | 10-15 | ○ | 10-15 | ○ | 10-15 | ○ | 10-15 | ○ | 10-15 | ○ | 10-15 |

|   |       |   |       |   |       |   |       |   |       |   |       |   |       |   |       |
|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|
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|   |       |   |       |   |       |   |       |   |       |   |       |   |       |   |       |
|   |       |   |       |   |       |   |       |   |       |   |       |   |       |   |       |
| ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 |
| ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 |
| ● | 35-40 | ● | 35-40 | ● | 35-40 | ● | 35-40 | ● | 35-40 | ● | 35-40 | ● | 35-40 | ● | 35-40 |

|   |       |   |       |   |       |   |       |   |       |   |       |   |       |   |       |
|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|
| ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 |
| ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 | ● | 40-45 |

|   |       |   |       |   |       |   |       |   |       |   |       |   |       |   |       |
|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|---|-------|
|   |       |   |       |   |       |   |       |   |       |   |       |   |       |   |       |
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|   |       |   |       |   |       |   |       |   |       |   |       |   |       |   |       |
| ● | 10-15 | ● | 10-15 | ● | 10-15 | ● | 10-15 | ● | 10-15 | ● | 10-15 | ● | 10-15 | ● | 10-15 |
|   |       |   |       |   |       |   |       |   |       |   |       |   |       |   |       |
|   |       |   |       |   |       |   |       |   |       |   |       |   |       |   |       |

# TAP APPLICATION TABLE



|          |            | P        |       | S       |       | S       |       | S        |       | H        |       | H          |       | OLIO DA TAGLIO                                                                                     |
|----------|------------|----------|-------|---------|-------|---------|-------|----------|-------|----------|-------|------------|-------|----------------------------------------------------------------------------------------------------|
|          |            | HSSZ     |       | HSSK    |       | HSSK    |       | HSSK     |       | HM       |       | HM         |       |                                                                                                    |
|          |            | C (2-3)  |       | C (2-3) |       | C (2-3) |       | C (2-3)  |       | C (2-3)  |       | E (1,5-2)  |       |                                                                                                    |
|          |            | 3xD      |       | 3xD     |       | 3xD     |       | 3xD      |       | 2,5xD    |       | 2,5xD      |       |                                                                                                    |
|          |            | RED-MAXX |       | TiN     |       | V-MAXX  |       | TiN      |       | V-MAXX   |       | V-MAXX     |       |                                                                                                    |
|          |            |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| M        | 4H         |          |       |         |       |         |       |          |       |          |       |            |       | VTO-100                                                                                            |
|          | 6H/6HX     | P900 N L | 157   | S80 N   | 189   | S80 N   | 189   | BS80 N R | 189   | HB80 N R | 197   | HB80 N R E | 197   | Suitable for tapping with cutting or forming taps on all materials. Available only in EU countries |
|          | 6G/6GX     |          |       | S80 N   | 189   |         |       |          |       |          |       |            |       |                                                                                                    |
|          | 7G/7GX     |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
|          | 6H +0,1    |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| EG-M     | 6H MOD     |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| MF       | 6H/6HX     |          |       |         |       |         |       |          |       |          |       | HB81 N R E | 199   | € P.74                                                                                             |
|          | 6G/6GX     |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| UNC      | 2B/2BX     |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
|          | 3B         |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| UNF      | 2B/2BX     |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
|          | 3B         |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| 8-UN     | 2B         |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| G        | ISO 5969/X |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| Rp(BSPP) | --         |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| Rc(BSPT) | --         |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| BSW      | mc         |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| NPT      | --         |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| NPTF     | --         |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| ISO 513  | Group      |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| P        | P.1        | ●        | 40-45 | ●       | 50-60 | ●       | 50-60 | ●        | 50-60 | ●        | 40-50 | ●          | 40-50 |                                                                                                    |
|          | P.2        | ●        | 40-45 | ●       | 50-60 | ●       | 50-60 | ●        | 50-60 | ●        | 40-50 | ●          | 40-50 |                                                                                                    |
|          | P.3        | ●        | 35-40 | ●       | 45-55 | ●       | 45-55 | ●        | 45-55 | ●        | 35-45 | ●          | 35-45 |                                                                                                    |
|          | P.4        | ●        | 30-35 | ●       | 40-50 | ●       | 40-50 | ●        | 40-50 | ●        | 30-40 | ●          | 30-40 |                                                                                                    |
|          | P.5        | ●        | 15-20 | ●       | 20-30 | ●       | 20-30 | ●        | 20-30 | ●        | 15-25 | ●          | 15-25 |                                                                                                    |
|          | P.6        |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
|          | P.7        | ○        | 10-15 | ●       | 10-20 | ●       | 10-20 | ●        | 10-20 | ●        | 10-20 | ●          | 10-20 |                                                                                                    |
| M        | M.1        | ○        | 10-15 | ●       | 10-20 | ●       | 10-20 | ●        | 10-20 | ●        | 10-20 | ●          | 10-20 |                                                                                                    |
|          | M.2        |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| K        | K.1        |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
|          | K.2        |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
|          | K.3        |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| N        | N.1        | ●        | 40-45 | ●       | 50-60 | ●       | 50-60 | ●        | 50-60 | ●        | 40-50 | ●          | 40-50 |                                                                                                    |
|          | N.2        | ●        | 40-45 | ●       | 50-60 | ●       | 50-60 | ●        | 50-60 | ●        | 40-50 | ●          | 40-50 |                                                                                                    |
|          | N.3        | ●        | 35-40 | ●       | 45-55 | ●       | 45-55 | ●        | 45-55 | ●        | 35-45 | ●          | 35-45 |                                                                                                    |
|          | N.4        |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
|          | N.5        | ●        | 40-45 | ●       | 50-60 | ●       | 50-60 | ●        | 50-60 | ●        | 40-50 | ●          | 40-50 |                                                                                                    |
|          | N.6        | ●        | 40-45 | ●       | 50-60 | ●       | 50-60 | ●        | 50-60 | ●        | 40-50 | ●          | 40-50 |                                                                                                    |
|          | N.7        |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
|          | N.8        |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
|          | N.9        |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
|          | N.10       |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| S        | S.1        |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
|          | S.2        |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
|          | S.3        | ●        | 10-15 | ●       | 10-20 | ●       | 10-20 | ●        | 10-20 | ●        | 10-20 | ●          | 10-20 |                                                                                                    |
|          | S.4        |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
| H        | H.1        |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |
|          | H.2        |          |       |         |       |         |       |          |       |          |       |            |       |                                                                                                    |



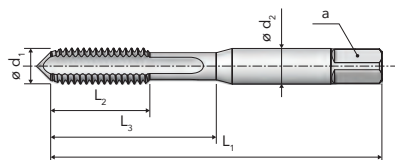
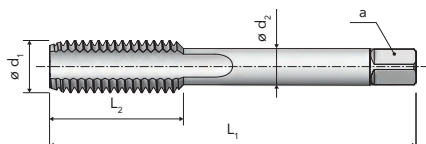
## A SERIES

TAPS FOR GENERIC APPLICATIONS





HSS

A1  
ROUGHINGA1  
SECONDA1  
FINISHINGA1  
SETDIN 352  
≤ M6DIN 352  
≥ M7

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A1<br>ROUGHING | A1<br>SECOND | A1<br>FINISHING | A1<br>SET |
|-----|-------|----------------|--------------|-----------------|-----------|
| P   | P.1-4 | •              | •            | •               | •         |
|     | P.7   | •              | •            | •               | •         |
| K   | K.2   | •              | •            | •               | •         |
| N   | N.1-3 | •              | •            | •               | •         |
|     | N.5-7 | •              | •            | •               | •         |



| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A1<br>ROUGHING<br>...0011A1AA0 | A1<br>SECOND<br>...0011A2AA0 | A1<br>FINISHING<br>...0011A3AA0 | A1<br>SET<br>...0011ASAA0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|--------------------------------|------------------------------|---------------------------------|---------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                |                              |                                 |                           |
| M 2             | 0,4  | 36                      | 7,5            | 12             | 2,8                   | 2,1      | 3   | 1,6  | A00020...                      | A00020...                    | A00020...                       | A00020...                 |
| 2,2             | 0,45 | 36                      | 8,5            | 13,5           | 2,8                   | 2,1      | 3   | 1,75 | A00022...                      | A00022...                    | A00022...                       | A00022...                 |
| 2,3             | 0,4  | 36                      | 8,5            | 13,5           | 2,8                   | 2,1      | 3   | 1,9  | A00023...                      | A00023...                    | A00023...                       | A00023...                 |
| 2,5             | 0,45 | 40                      | 8,5            | 14,5           | 2,8                   | 2,1      | 3   | 2,05 | A00025...                      | A00025...                    | A00025...                       | A00025...                 |
| 2,6             | 0,45 | 40                      | 8,5            | 14,5           | 2,8                   | 2,1      | 3   | 2,1  | A00026...                      | A00026...                    | A00026...                       | A00026...                 |
| 3               | 0,5  | 40                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                      | A00030...                    | A00030...                       | A00030...                 |
| 3,5             | 0,6  | 45                      | 11             | 20             | 4                     | 3        | 3   | 2,9  | A00035...                      | A00035...                    | A00035...                       | A00035...                 |
| 4               | 0,7  | 45                      | 12             | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                      | A00040...                    | A00040...                       | A00040...                 |
| 4,5             | 0,75 | 50                      | 13             | 23             | 6                     | 4,9      | 3   | 3,7  | A00045...                      | A00045...                    | A00045...                       | A00045...                 |
| 5               | 0,8  | 50                      | 14             | 24             | 6                     | 4,9      | 3   | 4,2  | A00050...                      | A00050...                    | A00050...                       | A00050...                 |
| 6               | 1    | 56                      | 16             | 28             | 6                     | 4,9      | 3   | 5    | A00060...                      | A00060...                    | A00060...                       | A00060...                 |
| 7               | 1    | 56                      | 19             | -              | 6                     | 4,9      | 3   | 6    | A00070...                      | A00070...                    | A00070...                       | A00070...                 |
| 8               | 1,25 | 63                      | 22             | -              | 6                     | 4,9      | 3   | 6,8  | A00080...                      | A00080...                    | A00080...                       | A00080...                 |
| 9               | 1,25 | 63                      | 22             | -              | 7                     | 5,5      | 3   | 7,8  | A00090...                      | A00090...                    | A00090...                       | A00090...                 |
| 10              | 1,5  | 70                      | 24             | -              | 7                     | 5,5      | 3   | 8,5  | A00100...                      | A00100...                    | A00100...                       | A00100...                 |
| 11              | 1,5  | 70                      | 24             | -              | 8                     | 6,2      | 3   | 9,5  | A00110...                      | A00110...                    | A00110...                       | A00110...                 |
| 12              | 1,75 | 75                      | 28             | -              | 9                     | 7        | 4   | 10,2 | A00120...                      | A00120...                    | A00120...                       | A00120...                 |
| 14              | 2    | 80                      | 30             | -              | 11                    | 9        | 4   | 12   | A00140...                      | A00140...                    | A00140...                       | A00140...                 |
| 16              | 2    | 80                      | 32             | -              | 12                    | 9        | 4   | 14   | A00160...                      | A00160...                    | A00160...                       | A00160...                 |
| 18              | 2,5  | 95                      | 34             | -              | 14                    | 11       | 4   | 15,5 | A00180...                      | A00180...                    | A00180...                       | A00180...                 |
| 20              | 2,5  | 95                      | 34             | -              | 16                    | 12       | 4   | 17,5 | A00200...                      | A00200...                    | A00200...                       | A00200...                 |
| 22              | 2,5  | 100                     | 34             | -              | 18                    | 14,5     | 4   | 19,5 | A00220...                      | A00220...                    | A00220...                       | A00220...                 |
| 24              | 3    | 110                     | 38             | -              | 18                    | 14,5     | 4   | 21   | A00240...                      | A00240...                    | A00240...                       | A00240...                 |
| 27              | 3    | 110                     | 38             | -              | 20                    | 16       | 4   | 24   | A00270...                      | A00270...                    | A00270...                       | A00270...                 |
| 30              | 3,5  | 125                     | 45             | -              | 22                    | 18       | 4   | 26,5 | A00300...                      | A00300...                    | A00300...                       | A00300...                 |
| 33              | 3,5  | 125                     | 50             | -              | 25                    | 20       | 4   | 29,5 | A00330...                      | A00330...                    | A00330...                       | A00330...                 |

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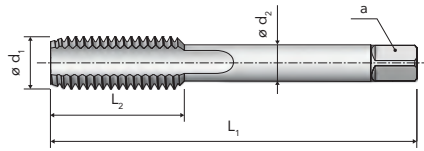

A1  
ROUGHING

A1  
SECOND

A1  
FINISHING

A1  
SET

DIN 352


A  
SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A1<br>ROUGHING | A1<br>SECOND | A1<br>FINISHING | A1<br>SET |
|-----|-------|----------------|--------------|-----------------|-----------|
| P   | P.1-4 | •              | •            | •               | •         |
|     | P.7   | •              | •            | •               | •         |
| K   | K.2   | •              | •            | •               | •         |
| N   | N.1-3 | •              | •            | •               | •         |
|     | N.5-7 | •              | •            | •               | •         |

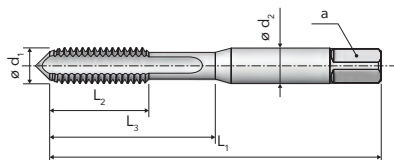
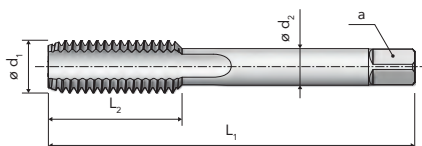


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| $\varnothing d_1$ | P    | $L_1$<br>js16 | $L_2$ | $L_3$ | $\varnothing d_2$<br>h9 | a<br>h12 | z   |      | A1<br>ROUGHING<br>...0011A1AA0 | A1<br>SECOND<br>...0011A2AA0 | A1<br>FINISHING<br>...0011A3AA0 | A1<br>SET<br>...0011ASAA0 |
|-------------------|------|---------------|-------|-------|-------------------------|----------|-----|------|--------------------------------|------------------------------|---------------------------------|---------------------------|
| [mm]              | [mm] | [mm]          | [mm]  | [mm]  | [mm]                    | [mm]     | [-] | [mm] |                                |                              |                                 |                           |
| M 36              | 4    | 150           | 56    | -     | 28                      | 22       | 4   | 32   | A00360...                      | A00360...                    | A00360...                       | A00360...                 |
| 39                | 4    | 150           | 60    | -     | 32                      | 24       | 4   | 35   | A00390...                      | A00390...                    | A00390...                       | A00390...                 |
| 42                | 4,5  | 150           | 60    | -     | 32                      | 24       | 4   | 37,5 | A00420...                      | A00420...                    | A00420...                       | A00420...                 |
| 45                | 4,5  | 160           | 65    | -     | 36                      | 29       | 4   | 40,5 | A00450...                      | A00450...                    | A00450...                       | A00450...                 |
| 48                | 5    | 180           | 70    | -     | 36                      | 29       | 4   | 43   | A00480...                      | A00480...                    | A00480...                       | A00480...                 |
| 52                | 5    | 180           | 70    | -     | 40                      | 32       | 5   | 47   | A00520...                      | A00520...                    | A00520...                       | A00520...                 |
| 56                | 5,5  | 180           | 70    | -     | 40                      | 32       | 5   | 50,5 | A00560...                      | A00560...                    | A00560...                       | A00560...                 |



HSS

A1 LH  
ROUGHINGA1 LH  
SECONDA1 LH  
FINISHINGA1 LH  
SETDIN 352  
≤ M6DIN 352  
≥ M8

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A1 LH<br>ROUGHING | A1 LH<br>SECOND | A1 LH<br>FINISHING | A1 LH<br>SET |
|-----|-------|-------------------|-----------------|--------------------|--------------|
| P   | P.1-4 | •                 | •               | •                  | •            |
|     | P.7   | •                 | •               | •                  | •            |
| K   | K.2   | •                 | •               | •                  | •            |
| N   | N.1-3 | •                 | •               | •                  | •            |
|     | N.5-7 | •                 | •               | •                  | •            |



| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A1 LH<br>ROUGHING<br>...0011C1AA0 | A1 LH<br>SECOND<br>...0011C2AA0 | A1 LH<br>FINISHING<br>...0011C3AA0 | A1 LH<br>SET<br>...0011CSAA0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|-----------------------------------|---------------------------------|------------------------------------|------------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                   |                                 |                                    |                              |
| M 2,6           | 0,45 | 40                      | 8,5            | 14,5           | 2,8                   | 2,1      | 3   | 2,1  | A00026...                         | A00026...                       | A00026...                          | A00026...                    |
| 3               | 0,5  | 40                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                         | A00030...                       | A00030...                          | A00030...                    |
| 3,5             | 0,6  | 45                      | 11             | 20             | 4                     | 3        | 3   | 2,9  | A00035...                         | A00035...                       | A00035...                          | A00035...                    |
| 4               | 0,7  | 45                      | 12             | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                         | A00040...                       | A00040...                          | A00040...                    |
| 5               | 0,8  | 50                      | 14             | 24             | 6                     | 4,9      | 3   | 4,2  | A00050...                         | A00050...                       | A00050...                          | A00050...                    |
| 6               | 1    | 56                      | 16             | 28             | 6                     | 4,9      | 3   | 5    | A00060...                         | A00060...                       | A00060...                          | A00060...                    |
| 8               | 1,25 | 63                      | 22             | -              | 6                     | 4,9      | 3   | 6,8  | A00080...                         | A00080...                       | A00080...                          | A00080...                    |
| 10              | 1,5  | 70                      | 24             | -              | 7                     | 5,5      | 3   | 8,5  | A00100...                         | A00100...                       | A00100...                          | A00100...                    |
| 12              | 1,75 | 75                      | 28             | -              | 9                     | 7        | 4   | 10,2 | A00120...                         | A00120...                       | A00120...                          | A00120...                    |
| 14              | 2    | 80                      | 30             | -              | 11                    | 9        | 4   | 12   | A00140...                         | A00140...                       | A00140...                          | A00140...                    |
| 16              | 2    | 80                      | 32             | -              | 12                    | 9        | 4   | 14   | A00160...                         | A00160...                       | A00160...                          | A00160...                    |
| 18              | 2,5  | 95                      | 34             | -              | 14                    | 11       | 4   | 15,5 | A00180...                         | A00180...                       | A00180...                          | A00180...                    |
| 20              | 2,5  | 95                      | 34             | -              | 16                    | 12       | 4   | 17,5 | A00200...                         | A00200...                       | A00200...                          | A00200...                    |
| 22              | 2,5  | 100                     | 34             | -              | 18                    | 14,5     | 4   | 19,5 | A00220...                         | A00220...                       | A00220...                          | A00220...                    |
| 24              | 3    | 110                     | 38             | -              | 18                    | 14,5     | 4   | 21   | A00240...                         | A00240...                       | A00240...                          | A00240...                    |
| 27              | 3    | 110                     | 38             | -              | 20                    | 16       | 4   | 24   | A00270...                         | A00270...                       | A00270...                          | A00270...                    |
| 30              | 3,5  | 125                     | 45             | -              | 22                    | 18       | 4   | 26,5 | A00300...                         | A00300...                       | A00300...                          | A00300...                    |



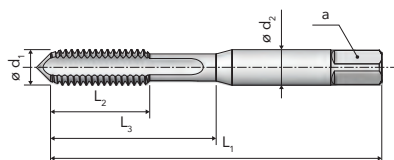
## A100 ROUGHING

**A100**  
SECOND

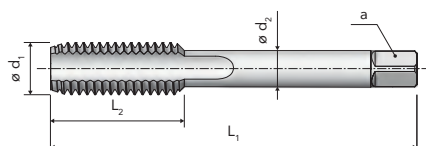
## A100 FINISHING

**A100**  
SET

**DIN 352**  
≤ M6



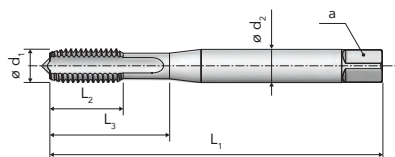
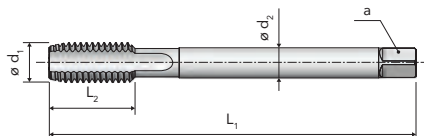
**DIN 352**  
≥ M8

A  
SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG     | A100<br>ROUGHING | A100<br>SECOND | A100<br>FINISHING | A100<br>SET |
|-----|--------|------------------|----------------|-------------------|-------------|
| P   | P.1-5  | ●                | ●              | ●                 | ●           |
|     | P.7    | ●                | ●              | ●                 | ●           |
| M   | M.1-2  | ●                | ●              | ●                 | ●           |
| K   | K.1-3  | ●                | ●              | ●                 | ●           |
| N   | N.1-10 | ●                | ●              | ●                 | ●           |
| S   | S.1    | ●                | ●              | ●                 | ●           |
|     | S.3    | ●                | ●              | ●                 | ●           |

[illegible]

**A21FC**  
BRIGHT**A21FC**  
TiN**DIN 371**  
≤ M10**DIN 376**  
≥ M11

## APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A21FC<br>BRIGHT | A21FC<br>TiN |  |  |
|-----|-----|-----------------|--------------|--|--|
| P   | P.1 |                 | • 20-25      |  |  |
|     | P.2 | • 10-12         | • 15-20      |  |  |
|     | P.3 | • 8-10          | • 12-15      |  |  |
| K   | K.2 | • 8-10          | • 12-15      |  |  |
| N   | N.1 |                 | • 20-25      |  |  |
|     | N.5 |                 | • 15-20      |  |  |

**ISO2**  
**6H****ISO2**  
**6H**

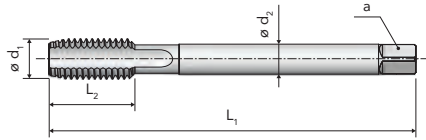
| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A21FC<br>BRIGHT<br>...0212A1AA0 | A21FC<br>TiN<br>...0212A1AD0 |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|---------------------------------|------------------------------|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                 |                              |  |  |
| <b>M 2</b>      | 0,4  | 45                      | 7              | 11             | 2,8                   | 2,1      | 3   | 1,6  | A00020...                       | A00020...                    |  |  |
| <b>2,5</b>      | 0,45 | 50                      | 9              | 15             | 2,8                   | 2,1      | 3   | 2,05 | A00025...                       | A00025...                    |  |  |
| <b>3</b>        | 0,5  | 56                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                       | A00030...                    |  |  |
| <b>3,5</b>      | 0,6  | 56                      | 11             | 20             | 4                     | 3        | 3   | 2,9  | A00035...                       | A00035...                    |  |  |
| <b>4</b>        | 0,7  | 63                      | 12             | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                       | A00040...                    |  |  |
| <b>5</b>        | 0,8  | 70                      | 14             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                       | A00050...                    |  |  |
| <b>6</b>        | 1    | 80                      | 16             | 29             | 6                     | 4,9      | 3   | 5    | A00060...                       | A00060...                    |  |  |
| <b>7</b>        | 1    | 80                      | 16             | 29             | 7                     | 5,5      | 3   | 6    | A00070...                       | A00070...                    |  |  |
| <b>8</b>        | 1,25 | 90                      | 18             | 33             | 8                     | 6,2      | 3   | 6,8  | A00080...                       | A00080...                    |  |  |
| <b>9</b>        | 1,25 | 90                      | 18             | 33             | 9                     | 7        | 3   | 7,8  | A00090...                       | A00090...                    |  |  |
| <b>10</b>       | 1,5  | 100                     | 20             | 36             | 10                    | 8        | 3   | 8,5  | A00100...                       | A00100...                    |  |  |
| <b>11</b>       | 1,5  | 100                     | 22             | -              | 8                     | 6,2      | 3   | 9,5  | A00110...                       | A00110...                    |  |  |
| <b>12</b>       | 1,75 | 110                     | 24             | -              | 9                     | 7        | 3   | 10,2 | A00120...                       | A00120...                    |  |  |
| <b>14</b>       | 2    | 110                     | 25             | -              | 11                    | 9        | 3   | 12   | A00140...                       | A00140...                    |  |  |
| <b>16</b>       | 2    | 110                     | 28             | -              | 12                    | 9        | 3   | 14   | A00160...                       | A00160...                    |  |  |
| <b>18</b>       | 2,5  | 125                     | 32             | -              | 14                    | 11       | 3   | 15,5 | A00180...                       | A00180...                    |  |  |
| <b>20</b>       | 2,5  | 140                     | 32             | -              | 16                    | 12       | 4   | 17,5 | A00200...                       | A00200...                    |  |  |
| <b>22</b>       | 2,5  | 140                     | 32             | -              | 18                    | 14,5     | 4   | 19,5 | A00220...                       | A00220...                    |  |  |
| <b>24</b>       | 3    | 160                     | 36             | -              | 18                    | 14,5     | 4   | 21   | A00240...                       | A00240...                    |  |  |
| <b>27</b>       | 3    | 160                     | 36             | -              | 20                    | 16       | 4   | 24   | A00270...                       | A00270...                    |  |  |
| <b>30</b>       | 3,5  | 180                     | 40             | -              | 22                    | 18       | 4   | 26,5 | A00300...                       | A00300...                    |  |  |
| <b>33</b>       | 3,5  | 180                     | 40             | -              | 25                    | 20       | 4   | 29,5 | A00330...                       | A00330...                    |  |  |
| <b>36</b>       | 4    | 200                     | 55             | -              | 28                    | 22       | 4   | 32   | A00360...                       | A00360...                    |  |  |
| <b>39</b>       | 4    | 200                     | 60             | -              | 32                    | 24       | 4   | 35   | A00390...                       |                              |  |  |
| <b>42</b>       | 4,5  | 200                     | 60             | -              | 32                    | 24       | 4   | 37,5 | A00420...                       |                              |  |  |
| <b>45</b>       | 4,5  | 220                     | 65             | -              | 36                    | 29       | 4   | 40,5 | A00450...                       |                              |  |  |



**HSSE**

**A21 FC**  
BRIGHT

DIN 376

A  
SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A21 FC<br>BRIGHT |  |  |  |
|-----|-----|------------------|--|--|--|
| P   | P.2 | ● 10-12          |  |  |  |
|     | P.3 | ● 8-10           |  |  |  |
| K   | K.2 | ● 8-10           |  |  |  |

ISO2  
6H



1,5xD



RH

[illegible]

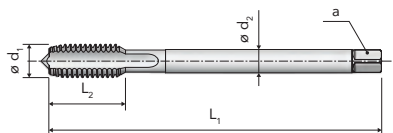


**A22 FC**  
BRIGHT

**A22 FC**  
TiN

A  
SERIES

DIN 376



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A22 FC<br>BRIGHT | A22 FC<br>TIN |  |  |
|-----|-----|------------------|---------------|--|--|
| P   | P.1 |                  | ● 20-25       |  |  |
|     | P.2 | ● 10-12          | ● 15-20       |  |  |
|     | P.3 | ● 8-10           | ● 12-15       |  |  |
| K   | K.2 | ● 8-10           | ● 12-15       |  |  |
| N   | N.1 |                  | ● 20-25       |  |  |
|     | N.5 |                  | ● 15-20       |  |  |

ISO2  
6H

ISO2  
6H



1,5xD

1,5xD

[illegible]

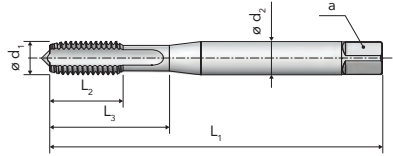


HSSE

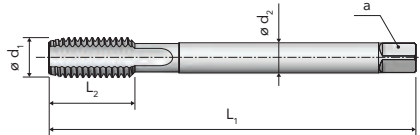
**A43**  
NITRIDED

**A43**  
TiCN

**DIN 371**  
≤ M10



**DIN 376**  
≥ M11



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG     | A43<br>NITRIDED | A43<br>TiCN |  |  |
|-----|--------|-----------------|-------------|--|--|
| K   | K.1    | ● 15-20         | ● 40-45     |  |  |
| N   | N.4    | ● 15-20         | ● 40-45     |  |  |
|     | N.7    | ● 15-20         | ● 40-45     |  |  |
|     | N.9-10 | ● 20-25         | ● 45-50     |  |  |

6HX

6HX



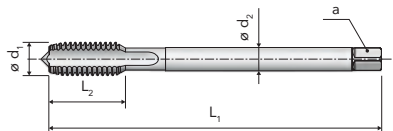
| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A43<br>NITRIDED<br>...0432A1ACO | A43<br>TiCN<br>...0432A1AE0 |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|---------------------------------|-----------------------------|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                 |                             |  |  |
| <b>M 3</b>      | 0,5  | 56                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                       | A00030...                   |  |  |
| <b>3,5</b>      | 0,6  | 56                      | 11             | 20             | 4                     | 3        | 3   | 2,9  | A00035...                       | A00035...                   |  |  |
| <b>4</b>        | 0,7  | 63                      | 12             | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                       | A00040...                   |  |  |
| <b>5</b>        | 0,8  | 70                      | 14             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                       | A00050...                   |  |  |
| <b>6</b>        | 1    | 80                      | 16             | 29             | 6                     | 4,9      | 4   | 5    | A00060...                       | A00060...                   |  |  |
| <b>7</b>        | 1    | 80                      | 16             | 29             | 7                     | 5,5      | 4   | 6    | A00070...                       | A00070...                   |  |  |
| <b>8</b>        | 1,25 | 90                      | 18             | 33             | 8                     | 6,2      | 4   | 6,8  | A00080...                       | A00080...                   |  |  |
| <b>9</b>        | 1,25 | 90                      | 18             | 33             | 9                     | 7        | 4   | 7,8  | A00090...                       | A00090...                   |  |  |
| <b>10</b>       | 1,5  | 100                     | 20             | 36             | 10                    | 8        | 4   | 8,5  | A00100...                       | A00100...                   |  |  |
| <b>11</b>       | 1,5  | 100                     | 22             | -              | 8                     | 6,2      | 4   | 9,5  | A00110...                       | A00110...                   |  |  |
| <b>12</b>       | 1,75 | 110                     | 24             | -              | 9                     | 7        | 4   | 10,2 | A00120...                       | A00120...                   |  |  |
| <b>14</b>       | 2    | 110                     | 25             | -              | 11                    | 9        | 4   | 12   | A00140...                       | A00140...                   |  |  |
| <b>16</b>       | 2    | 110                     | 28             | -              | 12                    | 9        | 4   | 14   | A00160...                       | A00160...                   |  |  |
| <b>18</b>       | 2,5  | 125                     | 32             | -              | 14                    | 11       | 4   | 15,5 | A00180...                       | A00180...                   |  |  |
| <b>20</b>       | 2,5  | 140                     | 32             | -              | 16                    | 12       | 4   | 17,5 | A00200...                       | A00200...                   |  |  |
| <b>22</b>       | 2,5  | 140                     | 32             | -              | 18                    | 14,5     | 4   | 19,5 | A00220...                       | A00220...                   |  |  |
| <b>24</b>       | 3    | 160                     | 36             | -              | 18                    | 14,5     | 5   | 21   | A00240...                       | A00240...                   |  |  |
| <b>27</b>       | 3    | 160                     | 36             | -              | 20                    | 16       | 5   | 24   | A00270...                       | A00270...                   |  |  |
| <b>30</b>       | 3,5  | 180                     | 40             | -              | 22                    | 18       | 5   | 26,5 | A00300...                       | A00300...                   |  |  |
| <b>33</b>       | 3,5  | 180                     | 40             | -              | 25                    | 20       | 5   | 29,5 | A00330...                       | A00330...                   |  |  |
| <b>36</b>       | 4    | 200                     | 55             | -              | 28                    | 22       | 5   | 32   | A00360...                       | A00360...                   |  |  |



**A44**  
NITRIDED

**A44**  
TiCN

DIN 376



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG     | A44      | A44     |  |  |
|-----|--------|----------|---------|--|--|
|     |        | NITRIDED | TiCN    |  |  |
| K   | K.1    | ● 15-20  | ● 40-45 |  |  |
| N   | N.4    | ● 15-20  | ● 40-45 |  |  |
|     | N.7    | ● 15-20  | ● 40-45 |  |  |
|     | N.9-10 | ● 20-25  | ● 45-50 |  |  |

6HX

6HX



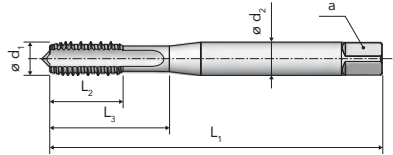
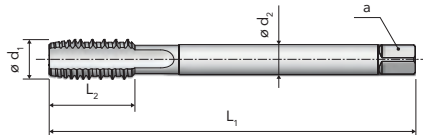
| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |  | <b>A44</b><br>NITRIDED<br>...0442A1ACO | <b>A44</b><br>TiCN<br>...0442A1AE0 |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|---------------------------------------------------------------------------------------|----------------------------------------|------------------------------------|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm]                                                                                  |                                        |                                    |  |  |
| <b>M 4</b>      | 0,7  | 63                      | 12             | -              | 2,8                   | 2,1      | 3   | 3,3                                                                                   | A00040...                              | A00040...                          |  |  |
| <b>5</b>        | 0,8  | 70                      | 14             | -              | 3,5                   | 2,7      | 3   | 4,2                                                                                   | A00050...                              | A00050...                          |  |  |
| <b>6</b>        | 1    | 80                      | 16             | -              | 4,5                   | 3,4      | 4   | 5                                                                                     | A00060...                              | A00060...                          |  |  |
| <b>8</b>        | 1,25 | 90                      | 18             | -              | 6                     | 4,9      | 4   | 6,8                                                                                   | A00080...                              | A00080...                          |  |  |
| <b>10</b>       | 1,5  | 100                     | 20             | -              | 7                     | 5,5      | 4   | 8,5                                                                                   | A00100...                              | A00100...                          |  |  |

# MACHINE TAPS for blind and through holes

## Straight flutes / interrupted thread / for light alloys


**HSSE**
**A67**  
BRIGHT

**A67**  
TiH1

**DIN 371**  
≤ M10

**DIN 376**  
≥ M12


### APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A67<br>BRIGHT | A67<br>TiH1 |  |  |
|-----|-----|---------------|-------------|--|--|
| P   | P.1 | • 12-15       | • 20-25     |  |  |
| N   | N.1 | • 12-15       | • 20-25     |  |  |
|     | N.2 | • 10-12       | • 15-20     |  |  |
|     | N.5 | • 10-12       | • 15-20     |  |  |
|     | N.6 | • 8-10        | • 12-15     |  |  |

**ISO2**  
**6H**

**ISO2**  
**6H**


| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A67<br>BRIGHT<br>...0672A1AA0 | A67<br>TiH1<br>...0672A1AH0 |  |  |
|-----------------|------|------------------------|----------------|----------------|-----------------------|----------|-----|------|-------------------------------|-----------------------------|--|--|
| [mm]            | [mm] | [mm]                   | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                               |                             |  |  |
| <b>M 3</b>      | 0,5  | 56                     | 10             | 18             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                     | A00030...                   |  |  |
| <b>4</b>        | 0,7  | 63                     | 12             | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                     | A00040...                   |  |  |
| <b>5</b>        | 0,8  | 70                     | 14             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                     | A00050...                   |  |  |
| <b>6</b>        | 1    | 80                     | 16             | 29             | 6                     | 4,9      | 3   | 5    | A00060...                     | A00060...                   |  |  |
| <b>8</b>        | 1,25 | 90                     | 18             | 33             | 8                     | 6,2      | 3   | 6,8  | A00080...                     | A00080...                   |  |  |
| <b>10</b>       | 1,5  | 100                    | 20             | 36             | 10                    | 8        | 3   | 8,5  | A00100...                     | A00100...                   |  |  |
| <b>12</b>       | 1,75 | 110                    | 24             | -              | 9                     | 7        | 3   | 10,2 | A00120...                     | A00120...                   |  |  |
| <b>14</b>       | 2    | 110                    | 25             | -              | 11                    | 9        | 3   | 12   | A00140...                     | A00140...                   |  |  |
| <b>16</b>       | 2    | 110                    | 28             | -              | 12                    | 9        | 3   | 14   | A00160...                     | A00160...                   |  |  |
| <b>18</b>       | 2,5  | 125                    | 32             | -              | 14                    | 11       | 3   | 15,5 | A00180...                     | A00180...                   |  |  |
| <b>20</b>       | 2,5  | 140                    | 32             | -              | 16                    | 12       | 3   | 17,5 | A00200...                     | A00200...                   |  |  |



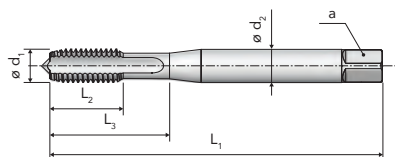
HSSK

**A110**  
VAP

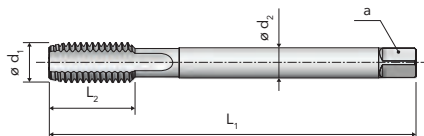
**A110**  
CrN

A  
SERIES

**DIN 371**  
≤ M10



**DIN 376**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A110<br>VAP | A110<br>CrN |  |  |
|-----|-----|-------------|-------------|--|--|
| S   | S.1 | ● 6-8       | ● 10-12     |  |  |
|     | S.2 | ● 3-5       | ● 6-8       |  |  |

ISO2  
6H

ISO2  
6H

[illegible]



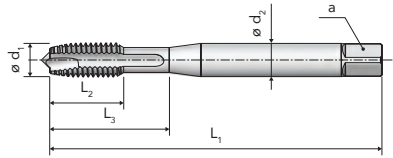
**A15 S**  
BRIGHT

**A15 S**  
VAP

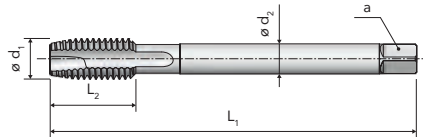
**A15 S**  
TiN

**A15 S**  
TiCN

**DIN 371**  
≤ M10



**DIN 376**  
≥ M11



A SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A15 S<br>BRIGHT | A15 S<br>VAP | A15 S<br>TiN | A15 S<br>TiCN |
|-----|-------|-----------------|--------------|--------------|---------------|
| P   | P.2   | • 20-25         | • 20-25      | • 30-35      | • 30-35       |
|     | P.3   | • 15-20         | • 15-20      | • 25-30      | • 25-30       |
|     | P.4   | • 12-15         | • 12-15      | • 20-25      | • 20-25       |
|     | P.5   |                 |              | • 10-15      | • 10-15       |
|     | P.7   |                 |              | • 8-10       | • 8-10        |
| M   | M.1   |                 |              | • 8-10       | • 8-10        |
| K   | K.2   | • 15-20         | • 15-20      | • 25-30      | • 25-30       |
| N   | N.2-3 | • 20-25         | • 20-25      | • 30-35      | • 30-35       |
|     | N.6   | • 15-18         | • 15-18      | • 25-30      | • 25-30       |



| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A15 S<br>BRIGHT<br>...0152B2AA0 | A15 S<br>VAP<br>...0152B2AB0 | A15 S<br>TiN<br>...0152B2AD0 | A15 S<br>TiCN<br>...0152B2AE0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|---------------------------------|------------------------------|------------------------------|-------------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                 |                              |                              |                               |
| M 2             | 0,4  | 45                      | 7              | 11             | 2,8                   | 2,1      | 2   | 1,6  | A00020...                       | A00020...                    | A00020...                    | A00020...                     |
| 2,2             | 0,45 | 45                      | 8              | 13             | 2,8                   | 2,1      | 2   | 1,75 | A00022...                       | A00022...                    | A00022...                    |                               |
| 2,3             | 0,4  | 45                      | 8              | 13             | 2,8                   | 2,1      | 2   | 1,9  | A00023...                       | A00023...                    | A00023...                    |                               |
| 2,5             | 0,45 | 50                      | 9              | 15             | 2,8                   | 2,1      | 3   | 2,05 | A00025...                       | A00025...                    | A00025...                    | A00025...                     |
| 2,6             | 0,45 | 50                      | 9              | 15             | 2,8                   | 2,1      | 3   | 2,1  | A00026...                       | A00026...                    | A00026...                    |                               |
| 3               | 0,5  | 56                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                       | A00030...                    | A00030...                    | A00030...                     |
| 3,5             | 0,6  | 56                      | 11             | 20             | 4                     | 3        | 3   | 2,9  | A00035...                       | A00035...                    | A00035...                    | A00035...                     |
| 4               | 0,7  | 63                      | 12             | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                       | A00040...                    | A00040...                    | A00040...                     |
| 5               | 0,8  | 70                      | 14             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                       | A00050...                    | A00050...                    | A00050...                     |
| 6               | 1    | 80                      | 16             | 29             | 6                     | 4,9      | 3   | 5    | A00060...                       | A00060...                    | A00060...                    | A00060...                     |
| 7               | 1    | 80                      | 16             | 29             | 7                     | 5,5      | 3   | 6    | A00070...                       | A00070...                    | A00070...                    | A00070...                     |
| 8               | 1,25 | 90                      | 18             | 33             | 8                     | 6,2      | 3   | 6,8  | A00080...                       | A00080...                    | A00080...                    | A00080...                     |
| 9               | 1,25 | 90                      | 18             | 33             | 9                     | 7        | 3   | 7,8  | A00090...                       | A00090...                    | A00090...                    | A00090...                     |
| 10              | 1,5  | 100                     | 20             | 36             | 10                    | 8        | 3   | 8,5  | A00100...                       | A00100...                    | A00100...                    | A00100...                     |
| 11              | 1,5  | 100                     | 22             | -              | 8                     | 6,2      | 3   | 9,5  | A00110...                       | A00110...                    | A00110...                    |                               |
| 12              | 1,75 | 110                     | 24             | -              | 9                     | 7        | 4   | 10,2 | A00120...                       | A00120...                    | A00120...                    | A00120...                     |
| 14              | 2    | 110                     | 25             | -              | 11                    | 9        | 4   | 12   | A00140...                       | A00140...                    | A00140...                    | A00140...                     |
| 16              | 2    | 110                     | 28             | -              | 12                    | 9        | 4   | 14   | A00160...                       | A00160...                    | A00160...                    | A00160...                     |
| 18              | 2,5  | 125                     | 32             | -              | 14                    | 11       | 4   | 15,5 | A00180...                       | A00180...                    | A00180...                    | A00180...                     |
| 20              | 2,5  | 140                     | 32             | -              | 16                    | 12       | 4   | 17,5 | A00200...                       | A00200...                    | A00200...                    | A00200...                     |
| 22              | 2,5  | 140                     | 32             | -              | 18                    | 14,5     | 4   | 19,5 | A00220...                       | A00220...                    | A00220...                    | A00220...                     |
| 24              | 3    | 160                     | 36             | -              | 18                    | 14,5     | 4   | 21   | A00240...                       | A00240...                    | A00240...                    | A00240...                     |
| 27              | 3    | 160                     | 36             | -              | 20                    | 16       | 4   | 24   | A00270...                       | A00270...                    | A00270...                    | A00270...                     |
| 30              | 3,5  | 180                     | 40             | -              | 22                    | 18       | 4   | 26,5 | A00300...                       | A00300...                    | A00300...                    | A00300...                     |
| 33              | 3,5  | 180                     | 40             | -              | 25                    | 20       | 5   | 29,5 | A00330...                       |                              | A00330...                    |                               |
| 36              | 4    | 200                     | 55             | -              | 28                    | 22       | 5   | 32   | A00360...                       |                              | A00360...                    |                               |

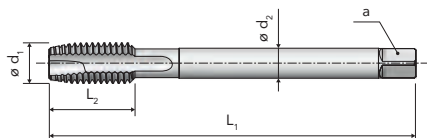
»



HSSE

**A15 S**  
BRIGHT

DIN 376



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A15 S<br>BRIGHT |  |  |  |
|-----|-------|-----------------|--|--|--|
| P   | P.2   | ● 20-25         |  |  |  |
|     | P.3   | ● 15-20         |  |  |  |
|     | P.4   | ● 12-15         |  |  |  |
| K   | K.2   | ● 15-20         |  |  |  |
| N   | N.2-3 | ● 20-25         |  |  |  |
|     | N.6   | ● 15-18         |  |  |  |

ISO2  
6H

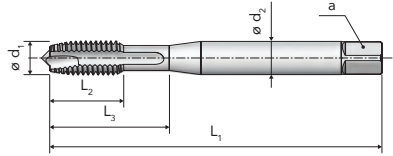
[illegible]



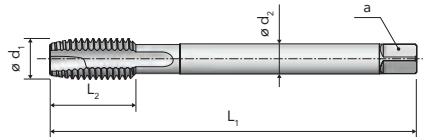
**A15 S 4H**  
BRIGHT

**A15 S 4H**  
TiN

**DIN 371**  
≤ M10



**DIN 376**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

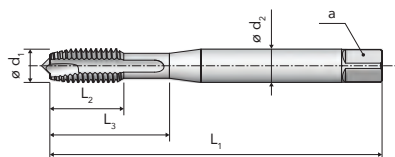
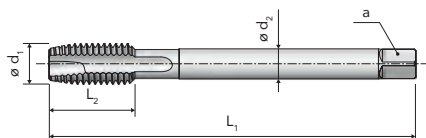
| ISO      | MG    | A15 S 4H<br>BRIGHT | A15 S 4H<br>TiN |  |  |
|----------|-------|--------------------|-----------------|--|--|
| <b>P</b> | P.2   | • 20-25            | • 30-35         |  |  |
|          | P.3   | • 15-20            | • 25-30         |  |  |
|          | P.4   | • 12-15            | • 20-25         |  |  |
|          | P.5   |                    | • 10-15         |  |  |
|          | P.7   |                    | • 8-10          |  |  |
| <b>M</b> | M.1   |                    | • 8-10          |  |  |
| <b>K</b> | K.2   | • 15-20            | • 25-30         |  |  |
| <b>N</b> | N.2-3 | • 20-25            | • 30-35         |  |  |
|          | N.6   | • 15-18            | • 25-30         |  |  |

**ISO1  
4H**

**ISO1  
4H**



| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A15 S 4H<br>BRIGHT<br>...0152B2BA0 | A15 S 4H<br>TiN<br>...0152B2BD0 |  |  |
|-----------------|------|------------------------|----------------|----------------|-----------------------|----------|-----|------|------------------------------------|---------------------------------|--|--|
| [mm]            | [mm] | [mm]                   | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                    |                                 |  |  |
| <b>M 2</b>      | 0,4  | 45                     | 7              | 11             | 2,8                   | 2,1      | 2   | 1,6  | A00020...                          | A00020...                       |  |  |
| <b>2,5</b>      | 0,45 | 50                     | 9              | 15             | 2,8                   | 2,1      | 3   | 2,05 | A00025...                          | A00025...                       |  |  |
| <b>3</b>        | 0,5  | 56                     | 10             | 18             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                          | A00030...                       |  |  |
| <b>4</b>        | 0,7  | 63                     | 12             | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                          | A00040...                       |  |  |
| <b>5</b>        | 0,8  | 70                     | 14             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                          | A00050...                       |  |  |
| <b>6</b>        | 1    | 80                     | 16             | 29             | 6                     | 4,9      | 3   | 5    | A00060...                          | A00060...                       |  |  |
| <b>8</b>        | 1,25 | 90                     | 18             | 33             | 8                     | 6,2      | 3   | 6,8  | A00080...                          | A00080...                       |  |  |
| <b>10</b>       | 1,5  | 100                    | 20             | 36             | 10                    | 8        | 3   | 8,5  | A00100...                          | A00100...                       |  |  |
| <b>12</b>       | 1,75 | 110                    | 24             | -              | 9                     | 7        | 4   | 10,2 | A00120...                          | A00120...                       |  |  |
| <b>14</b>       | 2    | 110                    | 25             | -              | 11                    | 9        | 4   | 12   | A00140...                          | A00140...                       |  |  |
| <b>16</b>       | 2    | 110                    | 28             | -              | 12                    | 9        | 4   | 14   | A00160...                          | A00160...                       |  |  |

**A15 S 6G**  
BRIGHT**A15 S 6G**  
TiNA  
SERIES**DIN 371**  
≤ M10**DIN 376**  
≥ M12

APPLICATION RANGE - CUTTING SPEED m/min

| ISO      | MG    | A15 S 6G<br>BRIGHT | A15 S 6G<br>TiN |  |  |
|----------|-------|--------------------|-----------------|--|--|
| <b>P</b> | P.2   | ● 20-25            | ● 30-35         |  |  |
|          | P.3   | ● 15-20            | ● 25-30         |  |  |
|          | P.4   | ● 12-15            | ● 20-25         |  |  |
|          | P.5   |                    | ● 10-15         |  |  |
| <b>M</b> | M.1   |                    | ● 8-10          |  |  |
|          | M.2   |                    | ● 8-10          |  |  |
| <b>K</b> | K.2   | ● 15-20            | ● 25-30         |  |  |
| <b>N</b> | N.2-3 | ● 20-25            | ● 30-35         |  |  |
|          | N.6   | ● 15-18            | ● 25-30         |  |  |



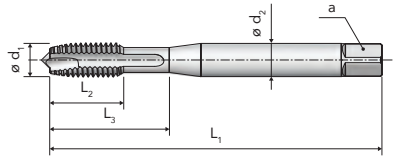
| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A15 S 6G<br>BRIGHT<br>...0152B2CA0 | A15 S 6G<br>TiN<br>...0152B2CDO |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|------------------------------------|---------------------------------|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                    |                                 |  |  |
| <b>M 2</b>      | 0,4  | 45                      | 7              | 11             | 2,8                   | 2,1      | 2   | 1,6  | A00020...                          | A00020...                       |  |  |
| <b>2,5</b>      | 0,45 | 50                      | 9              | 15             | 2,8                   | 2,1      | 3   | 2,05 | A00025...                          | A00025...                       |  |  |
| <b>3</b>        | 0,5  | 56                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                          | A00030...                       |  |  |
| <b>4</b>        | 0,7  | 63                      | 12             | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                          | A00040...                       |  |  |
| <b>5</b>        | 0,8  | 70                      | 14             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                          | A00050...                       |  |  |
| <b>6</b>        | 1    | 80                      | 16             | 29             | 6                     | 4,9      | 3   | 5    | A00060...                          | A00060...                       |  |  |
| <b>8</b>        | 1,25 | 90                      | 18             | 33             | 8                     | 6,2      | 3   | 6,8  | A00080...                          | A00080...                       |  |  |
| <b>10</b>       | 1,5  | 100                     | 20             | 36             | 10                    | 8        | 3   | 8,5  | A00100...                          | A00100...                       |  |  |
| <b>12</b>       | 1,75 | 110                     | 24             | -              | 9                     | 7        | 4   | 10,2 | A00120...                          | A00120...                       |  |  |
| <b>14</b>       | 2    | 110                     | 25             | -              | 11                    | 9        | 4   | 12   | A00140...                          | A00140...                       |  |  |
| <b>16</b>       | 2    | 110                     | 28             | -              | 12                    | 9        | 4   | 14   | A00160...                          | A00160...                       |  |  |



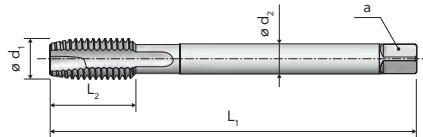
**A15 S 7G**  
BRIGHT

**A15 S 7G**  
TiN

**DIN 371**  
≤ M10



**DIN 376**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO      | MG    | A15 S 7G<br>BRIGHT | A15 S 7G<br>TiN |  |  |
|----------|-------|--------------------|-----------------|--|--|
| <b>P</b> | P.2   | • 20-25            | • 30-35         |  |  |
|          | P.3   | • 15-20            | • 25-30         |  |  |
|          | P.4   | • 12-15            | • 20-25         |  |  |
|          | P.5   |                    | • 10-15         |  |  |
|          | P.7   |                    | • 8-10          |  |  |
| <b>M</b> | M.1   |                    | • 8-10          |  |  |
| <b>K</b> | K.2   | • 15-20            | • 25-30         |  |  |
| <b>N</b> | N.2-3 | • 20-25            | • 30-35         |  |  |
|          | N.6   | • 15-18            | • 25-30         |  |  |

7G

7G



| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   | z    | A15 S 7G<br>BRIGHT<br>...0152B2DA0 | A15 S 7G<br>TiN<br>...0152B2DD0 |  |  |
|-----------------|------|------------------------|----------------|----------------|-----------------------|----------|-----|------|------------------------------------|---------------------------------|--|--|
| [mm]            | [mm] | [mm]                   | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                    |                                 |  |  |
| <b>M 3</b>      | 0,5  | 56                     | 10             | 18             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                          | A00030...                       |  |  |
| <b>4</b>        | 0,7  | 63                     | 12             | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                          | A00040...                       |  |  |
| <b>5</b>        | 0,8  | 70                     | 14             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                          | A00050...                       |  |  |
| <b>6</b>        | 1    | 80                     | 16             | 29             | 6                     | 4,9      | 3   | 5    | A00060...                          | A00060...                       |  |  |
| <b>8</b>        | 1,25 | 90                     | 18             | 33             | 8                     | 6,2      | 3   | 6,8  | A00080...                          | A00080...                       |  |  |
| <b>10</b>       | 1,5  | 100                    | 20             | 36             | 10                    | 8        | 3   | 8,5  | A00100...                          | A00100...                       |  |  |
| <b>12</b>       | 1,75 | 110                    | 24             | -              | 9                     | 7        | 4   | 10,2 | A00120...                          | A00120...                       |  |  |
| <b>14</b>       | 2    | 110                    | 25             | -              | 11                    | 9        | 4   | 12   | A00140...                          | A00140...                       |  |  |
| <b>16</b>       | 2    | 110                    | 28             | -              | 12                    | 9        | 4   | 14   | A00160...                          | A00160...                       |  |  |



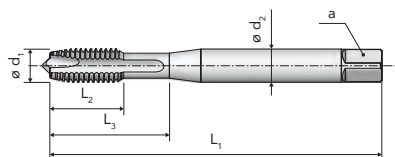
HSSE

**A15 S LH**  
BRIGHT

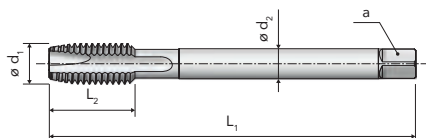
**A15 S LH**  
TiN

A  
SERIES

**DIN 371**  
≤ M10



**DIN 376**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A15 S LH<br>BRIGHT | A15 S LH<br>TIN |  |  |
|-----|-------|--------------------|-----------------|--|--|
| P   | P.2   | ● 20-25            | ● 30-35         |  |  |
|     | P.3   | ● 15-20            | ● 25-30         |  |  |
|     | P.4   | ● 12-15            | ● 20-25         |  |  |
|     | P.5   |                    | ● 10-15         |  |  |
|     | P.7   |                    | ● 8-10          |  |  |
| M   | M.1   |                    | ● 8-10          |  |  |
| K   | K.2   | ● 15-20            | ● 25-30         |  |  |
| N   | N.2-3 | ● 20-25            | ● 30-35         |  |  |
|     | N.6   | ● 15-18            | ● 25-30         |  |  |

ISO2  
6H



ISO2  
6H

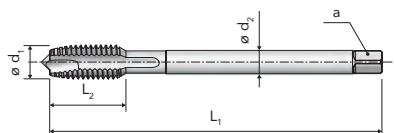
[illegible]



**A16 S**  
BRIGHT

**A16 S**  
TiN

DIN 376



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A16 S<br>BRIGHT | A16 S<br>TIN |  |  |
|-----|-------|-----------------|--------------|--|--|
| P   | P.2   | ● 20-25         | ● 30-35      |  |  |
|     | P.3   | ● 15-20         | ● 25-30      |  |  |
|     | P.4   | ● 12-15         | ● 20-25      |  |  |
|     | P.5   |                 | ● 10-15      |  |  |
|     | P.7   |                 | ● 8-10       |  |  |
| M   | M.1   |                 | ● 8-10       |  |  |
| K   | K.2   | ● 15-20         | ● 25-30      |  |  |
| N   | N.2-3 | ● 20-25         | ● 30-35      |  |  |
|     | N.6   | ● 15-18         | ● 25-30      |  |  |

ISO2  
6H

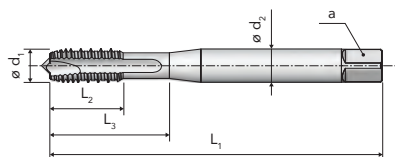
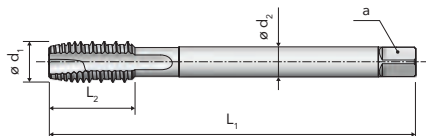


2,5xD



ISO2  
6H

[illegible]

A15 AZ  
BRIGHTA15 AZ  
TiH1DIN 371  
≤ M10DIN 376  
≥ M12

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A15 AZ<br>BRIGHT | A15 AZ<br>TiH1 |  |  |
|-----|-----|------------------|----------------|--|--|
| P   | P.1 | • 18-20          | • 30-35        |  |  |
| N   | N.1 | • 18-20          | • 30-40        |  |  |
|     | N.2 | • 15-18          | • 30-40        |  |  |
|     | N.5 | • 15-18          | • 30-35        |  |  |
|     | N.6 | • 12-15          | • 30-35        |  |  |

ISO2  
6HISO2  
6H

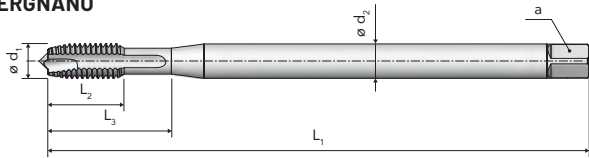
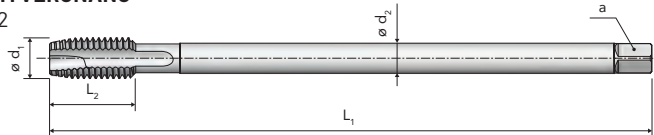
| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A15 AZ<br>BRIGHT<br>...0152F2AA0 | A15 AZ<br>TiH1<br>...0152F2AH0 |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|----------------------------------|--------------------------------|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                  |                                |  |  |
| M 3             | 0,5  | 56                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                        | A00030...                      |  |  |
| 4               | 0,7  | 63                      | 12             | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                        | A00040...                      |  |  |
| 5               | 0,8  | 70                      | 14             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                        | A00050...                      |  |  |
| 6               | 1    | 80                      | 16             | 29             | 6                     | 4,9      | 3   | 5    | A00060...                        | A00060...                      |  |  |
| 8               | 1,25 | 90                      | 18             | 33             | 8                     | 6,2      | 3   | 6,8  | A00080...                        | A00080...                      |  |  |
| 10              | 1,5  | 100                     | 20             | 36             | 10                    | 8        | 3   | 8,5  | A00100...                        | A00100...                      |  |  |
| 12              | 1,75 | 110                     | 24             | -              | 9                     | 7        | 3   | 10,2 | A00120...                        | A00120...                      |  |  |
| 14              | 2    | 110                     | 25             | -              | 11                    | 9        | 3   | 12   | A00140...                        | A00140...                      |  |  |
| 16              | 2    | 110                     | 28             | -              | 12                    | 9        | 3   | 14   | A00160...                        | A00160...                      |  |  |
|                 |      |                         |                |                |                       |          |     |      |                                  |                                |  |  |
|                 |      |                         |                |                |                       |          |     |      |                                  |                                |  |  |
|                 |      |                         |                |                |                       |          |     |      |                                  |                                |  |  |
|                 |      |                         |                |                |                       |          |     |      |                                  |                                |  |  |
|                 |      |                         |                |                |                       |          |     |      |                                  |                                |  |  |

# MACHINE TAPS for through holes

## Straight flutes with spiral point / long shank


**A15 L**  
BRIGHT

**A15 L**  
TiN

**NORM VERGNANO**  
≤ M10

**NORM VERGNANO**  
≥ M12


APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A15 L<br>BRIGHT | A15 L<br>TiN |  |  |
|-----|-----|-----------------|--------------|--|--|
| P   | P.1 | • 18-20         | • 30-35      |  |  |
|     | P.2 | • 15-18         | • 25-30      |  |  |
|     | P.3 | • 12-15         | • 20-25      |  |  |
| N   | N.1 | • 18-20         |              |  |  |
|     | N.2 | • 15-18         | • 25-30      |  |  |
|     | N.5 | • 15-18         |              |  |  |
|     | N.6 | • 12-15         | • 20-25      |  |  |

 ISO2  
6H

 ISO2  
6H


| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A15 L<br>BRIGHT<br>...0152L2AA0 | A15 L<br>TiN<br>...0152L2AD0 |  |  |
|-----------------|------|------------------------|----------------|----------------|-----------------------|----------|-----|------|---------------------------------|------------------------------|--|--|
| [mm]            | [mm] | [mm]                   | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                 |                              |  |  |
| <b>M 2</b>      | 0,4  | 90                     | 7              | 11             | 2,8                   | 2,1      | 2   | 1,6  | A00020...                       | A00020...                    |  |  |
| <b>2,5</b>      | 0,45 | 100                    | 9              | 15             | 2,8                   | 2,1      | 3   | 2,5  | A00025...                       | A00025...                    |  |  |
| <b>3</b>        | 0,5  | 112                    | 10             | 18             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                       | A00030...                    |  |  |
| <b>4</b>        | 0,7  | 112                    | 12             | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                       | A00040...                    |  |  |
| <b>5</b>        | 0,8  | 125                    | 14             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                       | A00050...                    |  |  |
| <b>6</b>        | 1    | 125                    | 16             | 29             | 6                     | 4,9      | 3   | 5    | A00060...                       | A00060...                    |  |  |
| <b>8</b>        | 1,25 | 140                    | 18             | 33             | 8                     | 6,2      | 3   | 6,8  | A00080...                       | A00080...                    |  |  |
| <b>10</b>       | 1,5  | 160                    | 20             | 36             | 10                    | 8        | 3   | 8,5  | A00100...                       | A00100...                    |  |  |
| <b>12</b>       | 1,75 | 180                    | 24             | -              | 9                     | 7        | 3   | 10,2 | A00120...                       | A00120...                    |  |  |
| <b>16</b>       | 2    | 200                    | 28             | -              | 12                    | 9        | 3   | 14   | A00160...                       | A00160...                    |  |  |
| <b>20</b>       | 2,5  | 225                    | 32             | -              | 16                    | 12       | 4   | 17,5 | A00200...                       | A00200...                    |  |  |

A SERIES



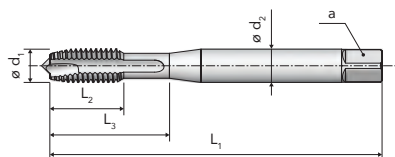
HSSE

**A150**  
VAP

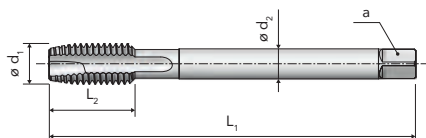
**A150**  
TiX<sub>2</sub>

A  
SERIES

**DIN 371**  
≤ M10



**DIN 376**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A150<br>VAP | A150<br>TiX2 |  |  |
|-----|-----|-------------|--------------|--|--|
| P   | P.7 | ● 10-12     | ● 10-15      |  |  |
| M   | M.1 | ● 10-12     | ● 10-15      |  |  |

6HX

6HX

[illegible]

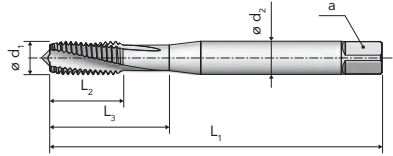


**A29**  
BRIGHT

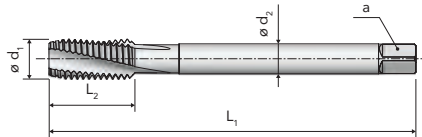
**A29**  
VAP

**A29**  
TiN

**DIN 371**  
≤ M10



**DIN 376**  
≥ M11



A SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A29<br>BRIGHT | A29<br>VAP | A29<br>TiN |
|-----|-------|---------------|------------|------------|
| P   | P.1   | • 18-20       | • 18-20    | • 30-35    |
|     | P.2   | • 15-18       | • 15-18    | • 25-30    |
|     | P.3   | • 12-15       | • 12-15    | • 20-25    |
|     | P.4   | • 10-12       | • 10-12    | • 15-20    |
|     | P.5   |               |            | • 5-10     |
| K   | K.2   | • 12-15       | • 12-15    | • 20-25    |
| N   | N.1   | • 18-20       | • 18-20    |            |
|     | N.2-3 | • 15-18       | • 15-18    | • 25-30    |
|     | N.5   | • 15-18       | • 15-18    |            |
|     | N.6   | • 12-15       | • 12-15    | • 20-25    |

ISO2  
6H



ISO2  
6H



ISO2  
6H



| Ød1        | P    | L1<br>js16 | L2   | L3   | Ød2<br>h9 | a<br>h12 | z   | Ød1  | A29<br>BRIGHT<br>...0292A1AA0 | A29<br>VAP<br>...0292A1AB0 | A29<br>TiN<br>...0292A1AD0 |
|------------|------|------------|------|------|-----------|----------|-----|------|-------------------------------|----------------------------|----------------------------|
| [mm]       | [mm] | [mm]       | [mm] | [mm] | [mm]      | [mm]     | [-] | [mm] |                               |                            |                            |
| <b>M2</b>  | 0,4  | 45         | 7    | 11   | 2,8       | 2,1      | 3   | 1,6  | A00020...                     | A00020...                  | A00020...                  |
| <b>2,2</b> | 0,45 | 45         | 8    | 13   | 2,8       | 2,1      | 3   | 1,75 | A00022...                     |                            |                            |
| <b>2,3</b> | 0,4  | 45         | 8    | 13   | 2,8       | 2,1      | 3   | 1,9  | A00023...                     |                            |                            |
| <b>2,5</b> | 0,45 | 50         | 9    | 15   | 2,8       | 2,1      | 3   | 2,05 | A00025...                     | A00025...                  | A00025...                  |
| <b>2,6</b> | 0,45 | 50         | 9    | 15   | 2,8       | 2,1      | 3   | 2,1  | A00026...                     |                            |                            |
| <b>3</b>   | 0,5  | 56         | 10   | 18   | 3,5       | 2,7      | 3   | 2,5  | A00030...                     | A00030...                  | A00030...                  |
| <b>3,5</b> | 0,6  | 56         | 11   | 20   | 4         | 3        | 3   | 2,9  | A00035...                     | A00035...                  | A00035...                  |
| <b>4</b>   | 0,7  | 63         | 12   | 21   | 4,5       | 3,4      | 3   | 3,3  | A00040...                     | A00040...                  | A00040...                  |
| <b>4,5</b> | 0,75 | 70         | 14   | 24,5 | 6         | 4,9      | 3   | 3,7  | A00045...                     |                            |                            |
| <b>5</b>   | 0,8  | 70         | 14   | 24,5 | 6         | 4,9      | 3   | 4,2  | A00050...                     | A00050...                  | A00050...                  |
| <b>6</b>   | 1    | 80         | 16   | 29   | 6         | 4,9      | 3   | 5    | A00060...                     | A00060...                  | A00060...                  |
| <b>7</b>   | 1    | 80         | 16   | 29   | 7         | 5,5      | 3   | 6    | A00070...                     | A00070...                  | A00070...                  |
| <b>8</b>   | 1,25 | 90         | 18   | 33   | 8         | 6,2      | 3   | 6,8  | A00080...                     | A00080...                  | A00080...                  |
| <b>9</b>   | 1,25 | 90         | 18   | 33   | 9         | 7        | 3   | 7,8  | A00090...                     | A00090...                  | A00090...                  |
| <b>10</b>  | 1,5  | 100        | 20   | 36   | 10        | 8        | 3   | 8,5  | A00100...                     | A00100...                  | A00100...                  |
| <b>11</b>  | 1,5  | 100        | 22   | -    | 8         | 6,2      | 3   | 9,5  | A00110...                     |                            |                            |
| <b>12</b>  | 1,75 | 110        | 24   | -    | 9         | 7        | 3   | 10,2 | A00120...                     | A00120...                  | A00120...                  |
| <b>14</b>  | 2    | 110        | 25   | -    | 11        | 9        | 3   | 12   | A00140...                     | A00140...                  | A00140...                  |
| <b>16</b>  | 2    | 110        | 28   | -    | 12        | 9        | 3   | 14   | A00160...                     | A00160...                  | A00160...                  |
| <b>18</b>  | 2,5  | 125        | 32   | -    | 14        | 11       | 3   | 15,5 | A00180...                     | A00180...                  | A00180...                  |
| <b>20</b>  | 2,5  | 140        | 32   | -    | 16        | 12       | 4   | 17,5 | A00200...                     | A00200...                  | A00200...                  |
| <b>22</b>  | 2,5  | 140        | 32   | -    | 18        | 14,5     | 4   | 19,5 | A00220...                     | A00220...                  | A00220...                  |
| <b>24</b>  | 3    | 160        | 36   | -    | 18        | 14,5     | 4   | 21   | A00240...                     | A00240...                  | A00240...                  |
| <b>27</b>  | 3    | 160        | 36   | -    | 20        | 16       | 4   | 24   | A00270...                     | A00270...                  | A00270...                  |
| <b>30</b>  | 3,5  | 180        | 40   | -    | 22        | 18       | 4   | 26,5 | A00300...                     | A00300...                  | A00300...                  |
| <b>33</b>  | 3,5  | 180        | 40   | -    | 25        | 20       | 5   | 29,5 | A00330...                     | A00330...                  | A00330...                  |

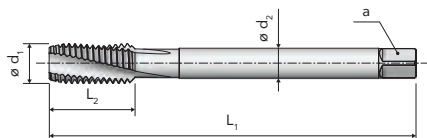




**A29**  
BRIGHT

A  
SERIES

DIN 376



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A29<br>BRIGHT |  |  |  |
|-----|-------|---------------|--|--|--|
| P   | P.1   | ● 18-20       |  |  |  |
|     | P.2   | ● 15-18       |  |  |  |
|     | P.3   | ● 12-15       |  |  |  |
|     | P.4   | ● 10-12       |  |  |  |
| K   | K.2   | ● 12-15       |  |  |  |
| N   | N.1   | ● 18-20       |  |  |  |
|     | N.2-3 | ● 15-18       |  |  |  |
|     | N.5   | ● 15-18       |  |  |  |
|     | N.6   | ● 12-15       |  |  |  |

ISO2  
6H



«

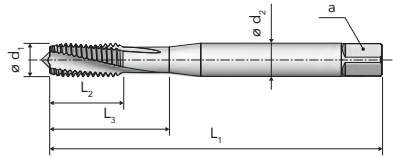
[illegible]



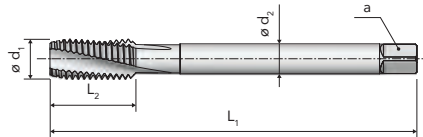
**A29 6G**  
BRIGHT

**A29 6G**  
TiN

**DIN 371**  
≤ M10



**DIN 376**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A29 6G<br>BRIGHT | A29 6G<br>TiN |  |  |
|-----|-------|------------------|---------------|--|--|
| P   | P.1   | ● 18-20          | ● 30-35       |  |  |
|     | P.2   | ● 15-18          | ● 25-30       |  |  |
|     | P.3   | ● 12-15          | ● 20-25       |  |  |
|     | P.4   | ● 10-12          | ● 15-20       |  |  |
|     | P.5   |                  | ● 5-10        |  |  |
| K   | K.2   | ● 12-15          | ● 20-25       |  |  |
| N   | N.1   | ● 18-20          |               |  |  |
|     | N.2-3 | ● 15-18          | ● 25-30       |  |  |
|     | N.5   | ● 15-18          |               |  |  |
|     | N.6   | ● 12-15          | ● 20-25       |  |  |

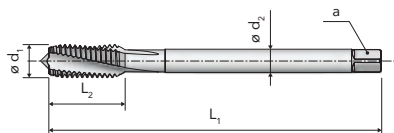
[illegible]



**A29 DIN 376**  
BRIGHT

**A29 DIN 376**  
TiN

DIN 376



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A29 DIN 376 | A29 DIN 376 |  |  |
|-----|-------|-------------|-------------|--|--|
|     |       | BRIGHT      | TiN         |  |  |
| P   | P.1   | ● 18-20     | ● 30-35     |  |  |
|     | P.2   | ● 15-18     | ● 25-30     |  |  |
|     | P.3   | ● 12-15     | ● 20-25     |  |  |
|     | P.4   | ● 10-12     | ● 15-20     |  |  |
|     | P.5   |             | ● 5-10      |  |  |
| K   | K.2   | ● 12-15     | ● 20-25     |  |  |
| N   | N.1   | ● 18-20     |             |  |  |
|     | N.2-3 | ● 15-18     | ● 25-30     |  |  |
|     | N.5   | ● 15-18     |             |  |  |
|     | N.6   | ● 12-15     | ● 20-25     |  |  |

ISO2  
6H

ISO2  
6H

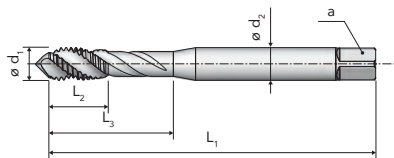
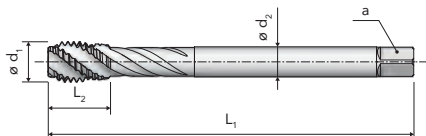


1,5xD

1,5xD

[illegible]



**A70 S**  
BRIGHT**A70 S**  
VAP**A70 S**  
TiN**A70 S**  
TiCNA  
SERIES**DIN 371**  
≤ M10**DIN 376**  
≥ M11

APPLICATION RANGE - CUTTING SPEED m/min

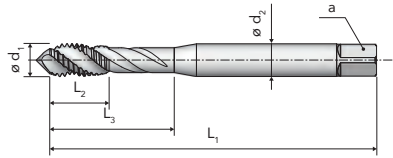
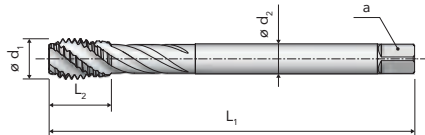
| ISO      | MG  | A70 S<br>BRIGHT | A70 S<br>VAP | A70 S<br>TiN | A70 S<br>TiCN |
|----------|-----|-----------------|--------------|--------------|---------------|
| <b>P</b> | P.2 | ● 15-20         | ● 15-20      | ● 25-30      | ● 25-30       |
|          | P.3 | ● 12-15         | ● 12-15      | ● 20-25      | ● 20-25       |
|          | P.4 | ● 10-12         | ● 10-12      | ● 15-20      | ● 15-20       |
|          | P.5 |                 |              | ● 5-10       | ● 5-10        |
| <b>M</b> | M.1 |                 |              | ● 6-8        | ● 6-8         |
|          | M.2 |                 |              | ● 6-8        | ● 6-8         |
| <b>K</b> | K.2 | ● 12-15         | ● 12-15      | ● 20-25      | ● 20-25       |
| <b>N</b> | N.3 | ● 15-18         | ● 15-18      | ● 25-30      | ● 25-30       |
|          | N.6 | ● 15-18         | ● 15-18      | ● 25-30      | ● 25-30       |

**ISO2**  
**6H****ISO2**  
**6H****ISO2**  
**6H****ISO2**  
**6H**

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A70 S<br>BRIGHT<br>...0702B1AA0 | A70 S<br>VAP<br>...0702B1AB0 | A70 S<br>TiN<br>...0702B1AD0 | A70 S<br>TiCN<br>...0702B1AE0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|---------------------------------|------------------------------|------------------------------|-------------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                 |                              |                              |                               |
| <b>M 2</b>      | 0,4  | 45                      | 6              | 12             | 2,8                   | 2,1      | 3   | 1,6  | A00020...                       | A00020...                    | A00020...                    | A00020...                     |
| <b>2,5</b>      | 0,45 | 50                      | 6,5            | 15             | 2,8                   | 2,1      | 3   | 2,05 | A00025...                       | A00025...                    | A00025...                    | A00025...                     |
| <b>3</b>        | 0,5  | 56                      | 7              | 15             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                       | A00030...                    | A00030...                    | A00030...                     |
| <b>3,5</b>      | 0,6  | 56                      | 8              | 18,5           | 4                     | 3        | 3   | 2,9  | A00035...                       | A00035...                    | A00035...                    | A00035...                     |
| <b>4</b>        | 0,7  | 63                      | 8,5            | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                       | A00040...                    | A00040...                    | A00040...                     |
| <b>5</b>        | 0,8  | 70                      | 10             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                       | A00050...                    | A00050...                    | A00050...                     |
| <b>6</b>        | 1    | 80                      | 12             | 29             | 6                     | 4,9      | 3   | 5    | A00060...                       | A00060...                    | A00060...                    | A00060...                     |
| <b>7</b>        | 1    | 80                      | 12             | 29             | 7                     | 5,5      | 3   | 6    | A00070...                       | A00070...                    | A00070...                    | A00070...                     |
| <b>8</b>        | 1,25 | 90                      | 15             | 33             | 8                     | 6,2      | 3   | 6,8  | A00080...                       | A00080...                    | A00080...                    | A00080...                     |
| <b>9</b>        | 1,25 | 90                      | 15             | 33             | 9                     | 7        | 3   | 7,8  | A00090...                       | A00090...                    | A00090...                    | A00090...                     |
| <b>10</b>       | 1,5  | 100                     | 17,5           | 38             | 10                    | 8        | 3   | 8,5  | A00100...                       | A00100...                    | A00100...                    | A00100...                     |
| <b>11</b>       | 1,5  | 100                     | 17,5           | -              | 8                     | 6,2      | 3   | 9,5  | A00110...                       | A00110...                    | A00110...                    | A00110...                     |
| <b>12</b>       | 1,75 | 110                     | 18             | -              | 9                     | 7        | 4   | 10,2 | A00120...                       | A00120...                    | A00120...                    | A00120...                     |
| <b>14</b>       | 2    | 110                     | 20,5           | -              | 11                    | 9        | 4   | 12   | A00140...                       | A00140...                    | A00140...                    | A00140...                     |
| <b>16</b>       | 2    | 110                     | 20,5           | -              | 12                    | 9        | 4   | 14   | A00160...                       | A00160...                    | A00160...                    | A00160...                     |
| <b>18</b>       | 2,5  | 125                     | 25,5           | -              | 14                    | 11       | 4   | 15,5 | A00180...                       | A00180...                    | A00180...                    | A00180...                     |
| <b>20</b>       | 2,5  | 140                     | 29,5           | -              | 16                    | 12       | 4   | 17,5 | A00200...                       | A00200...                    | A00200...                    | A00200...                     |
| <b>22</b>       | 2,5  | 140                     | 29,5           | -              | 18                    | 14,5     | 4   | 19,5 | A00220...                       | A00220...                    | A00220...                    | A00220...                     |
| <b>24</b>       | 3    | 160                     | 35,5           | -              | 18                    | 14,5     | 4   | 21   | A00240...                       | A00240...                    | A00240...                    | A00240...                     |
| <b>27</b>       | 3    | 160                     | 37,5           | -              | 20                    | 16       | 5   | 24   | A00270...                       | A00270...                    | A00270...                    | A00270...                     |
| <b>30</b>       | 3,5  | 180                     | 42             | -              | 22                    | 18       | 5   | 26,5 | A00300...                       | A00300...                    | A00300...                    | A00300...                     |
| <b>33</b>       | 3,5  | 180                     | 43,5           | -              | 25                    | 20       | 5   | 29,5 | A00330...                       | A00330...                    | A00330...                    |                               |
| <b>36</b>       | 4    | 200                     | 47             | -              | 28                    | 22       | 5   | 32   | A00360...                       | A00360...                    | A00360...                    |                               |
| <b>42</b>       | 4,5  | 200                     | 55             | -              | 32                    | 24       | 6   | 37,5 | A00420...                       |                              |                              |                               |
| <b>48</b>       | 5    | 250                     | 59,5           | -              | 36                    | 29       | 6   | 43   | A00480...                       |                              |                              |                               |
| <b>52</b>       | 5    | 250                     | 59,5           | -              | 40                    | 32       | 6   | 47   | A00520...                       |                              |                              |                               |


**A70 S 4H**  
 BRIGHT

**A70 S 4H**  
 TiN

**DIN 371**  
 $\leq M10$ 

**DIN 376**  
 $\geq M12$ 


A SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO      | MG  | A70 S 4H<br>BRIGHT | A70 S 4H<br>TiN |  |  |
|----------|-----|--------------------|-----------------|--|--|
| <b>P</b> | P.2 | ● 15-20            | ● 25-30         |  |  |
|          | P.3 | ● 12-15            | ● 20-25         |  |  |
|          | P.4 | ● 10-12            | ● 15-20         |  |  |
|          | P.5 |                    | ● 5-10          |  |  |
|          | P.7 |                    | ● 6-8           |  |  |
| <b>M</b> | M.1 |                    | ● 6-8           |  |  |
| <b>K</b> | K.2 | ● 12-15            | ● 20-25         |  |  |
| <b>N</b> | N.3 | ● 15-18            | ● 25-30         |  |  |
|          | N.6 | ● 15-18            | ● 25-30         |  |  |

**ISO1**  
**4H**

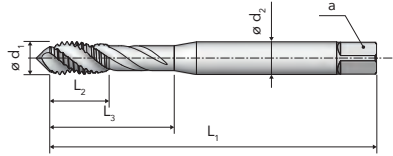
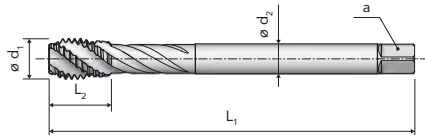
**ISO1**  
**4H**


| $\varnothing d_1$ | P    | $L_1$<br>js16 | $L_2$ | $L_3$ | $\varnothing d_2$<br>h9 | a<br>h12 | z   |      | A70 S 4H<br>BRIGHT<br>...0702B1BA0 | A70 S 4H<br>TiN<br>...0702B1BD0 |
|-------------------|------|---------------|-------|-------|-------------------------|----------|-----|------|------------------------------------|---------------------------------|
| [mm]              | [mm] | [mm]          | [mm]  | [mm]  | [mm]                    | [mm]     | [-] | [mm] |                                    |                                 |
| <b>M2</b>         | 0,4  | 45            | 6     | 12    | 2,8                     | 2,1      | 3   | 1,6  | A00020...                          | A00020...                       |
| <b>2,5</b>        | 0,45 | 50            | 6,5   | 15    | 2,8                     | 2,1      | 3   | 2,05 | A00025...                          | A00025...                       |
| <b>3</b>          | 0,5  | 56            | 7     | 15    | 3,5                     | 2,7      | 3   | 2,5  | A00030...                          | A00030...                       |
| <b>4</b>          | 0,7  | 63            | 8,5   | 21    | 4,5                     | 3,4      | 3   | 3,3  | A00040...                          | A00040...                       |
| <b>5</b>          | 0,8  | 70            | 10    | 24,5  | 6                       | 4,9      | 3   | 4,2  | A00050...                          | A00050...                       |
| <b>6</b>          | 1    | 80            | 12    | 29    | 6                       | 4,9      | 3   | 5    | A00060...                          | A00060...                       |
| <b>8</b>          | 1,25 | 90            | 15    | 33    | 8                       | 6,2      | 3   | 6,8  | A00080...                          | A00080...                       |
| <b>10</b>         | 1,5  | 100           | 17,5  | 38    | 10                      | 8        | 3   | 8,5  | A00100...                          | A00100...                       |
| <b>12</b>         | 1,75 | 110           | 18    | -     | 9                       | 7        | 4   | 10,2 | A00120...                          | A00120...                       |




**A70 S 7G**  
BRIGHT

**A70 S 7G**  
TiN

**DIN 371**  
≤ M10

**DIN 376**  
≥ M12


APPLICATION RANGE - CUTTING SPEED m/min

| ISO      | MG  | A70 S 7G<br>BRIGHT | A70 S 7G<br>TiN |  |  |
|----------|-----|--------------------|-----------------|--|--|
| <b>P</b> | P.2 | ● 15-20            | ● 25-30         |  |  |
|          | P.3 | ● 12-15            | ● 20-25         |  |  |
|          | P.4 | ● 10-12            | ● 15-20         |  |  |
|          | P.5 |                    | ● 5-10          |  |  |
|          | P.7 |                    | ● 6-8           |  |  |
| <b>M</b> | M.1 |                    | ● 6-8           |  |  |
| <b>K</b> | K.2 | ● 12-15            | ● 20-25         |  |  |
| <b>N</b> | N.3 | ● 15-18            | ● 25-30         |  |  |
|          | N.6 | ● 15-18            | ● 25-30         |  |  |

**7G**
**7G**


| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A70 S 7G<br>BRIGHT<br>...0702B1DA0 | A70 S 7G<br>TiN<br>...0702B1DD0 |
|-----------------|------|------------------------|----------------|----------------|-----------------------|----------|-----|------|------------------------------------|---------------------------------|
| [mm]            | [mm] | [mm]                   | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                    |                                 |
| <b>M 3</b>      | 0,5  | 56                     | 7              | 15             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                          | A00030...                       |
| <b>4</b>        | 0,7  | 63                     | 8,5            | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                          | A00040...                       |
| <b>5</b>        | 0,8  | 70                     | 10             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                          | A00050...                       |
| <b>6</b>        | 1    | 80                     | 12             | 29             | 6                     | 4,9      | 3   | 5    | A00060...                          | A00060...                       |
| <b>8</b>        | 1,25 | 90                     | 15             | 33             | 8                     | 6,2      | 3   | 6,8  | A00080...                          | A00080...                       |
| <b>10</b>       | 1,5  | 100                    | 17,5           | 38             | 10                    | 8        | 3   | 8,5  | A00100...                          | A00100...                       |
| <b>12</b>       | 1,75 | 110                    | 18             | -              | 9                     | 7        | 4   | 10,2 | A00120...                          | A00120...                       |
| <b>14</b>       | 2    | 110                    | 20,5           | -              | 11                    | 9        | 4   | 12   | A00140...                          | A00140...                       |
| <b>16</b>       | 2    | 110                    | 20,5           | -              | 12                    | 9        | 4   | 14   | A00160...                          | A00160...                       |

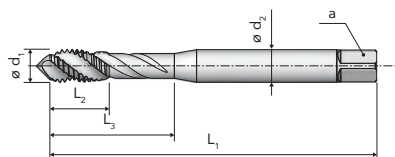


**A701 S**  
BRIGHT

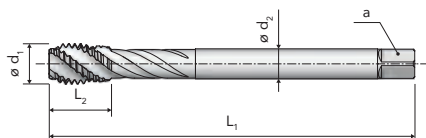
**A701 S**  
TiN

A  
SERIES

**DIN 371**  
≤ M10



**DIN 376**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A701S<br>BRIGHT | A701S<br>TIN |  |  |
|-----|-----|-----------------|--------------|--|--|
| P   | P.2 | ● 15-20         | ● 25-30      |  |  |
|     | P.3 | ● 12-15         | ● 20-25      |  |  |
|     | P.4 | ● 10-12         | ● 15-20      |  |  |
|     | P.5 |                 | ● 5-10       |  |  |
|     | P.7 |                 | ● 6-8        |  |  |
| M   | M.1 |                 | ● 6-8        |  |  |
| K   | K.2 | ● 12-15         | ● 20-25      |  |  |
| N   | N.3 | ● 15-18         | ● 25-30      |  |  |
|     | N.6 | ● 15-18         | ● 25-30      |  |  |

**6H**  
**+0,1mm**

**6H**  
**+0,1mm**

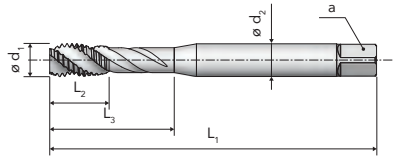
[illegible]



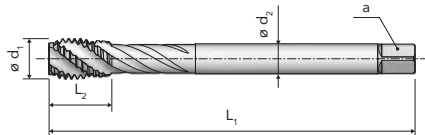
**A70 SE**  
BRIGHT

**A70 SE**  
TiN

**DIN 371**  
≤ M10



**DIN 376**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A70 SE<br>BRIGHT | A70 SE<br>TIN |  |  |
|-----|-----|------------------|---------------|--|--|
| P   | P.2 | ● 15-20          | ● 25-30       |  |  |
|     | P.3 | ● 12-15          | ● 20-25       |  |  |
|     | P.4 | ● 10-12          | ● 15-20       |  |  |
|     | P.5 |                  | ● 5-10        |  |  |
|     | P.7 |                  | ● 6-8         |  |  |
| M   | M.1 |                  | ● 6-8         |  |  |
| K   | K.2 | ● 12-15          | ● 20-25       |  |  |
| N   | N.3 | ● 15-18          | ● 25-30       |  |  |
|     | N.6 | ● 15-18          | ● 25-30       |  |  |

ISO2  
6H

ISO2  
6H

[illegible]

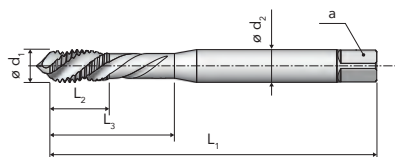


**A70 S LH**  
BRIGHT

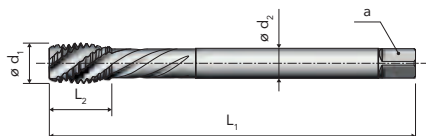
**A70 S LH**  
TiN

A  
SERIES

**DIN 371**  
≤ M10



**DIN 376**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A70 SLH<br>BRIGHT | A70 SLH<br>TIN |  |  |
|-----|-----|-------------------|----------------|--|--|
| P   | P.2 | ● 15-20           | ● 25-30        |  |  |
|     | P.3 | ● 12-15           | ● 20-25        |  |  |
|     | P.4 | ● 10-12           | ● 15-20        |  |  |
|     | P.5 |                   | ● 5-10         |  |  |
|     | P.7 |                   | ● 6-8          |  |  |
| M   | M.1 |                   | ● 6-8          |  |  |
| K   | K.2 | ● 12-15           | ● 20-25        |  |  |
| N   | N.3 | ● 15-18           | ● 25-30        |  |  |
|     | N.6 | ● 15-18           | ● 25-30        |  |  |

ISO2  
6H

ISO2  
6H

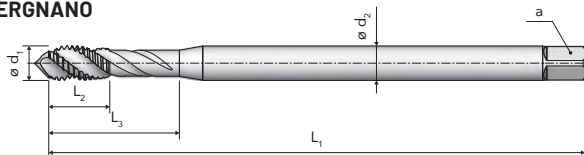
[illegible]



A70 L  
BRIGHTA70 L  
TiN

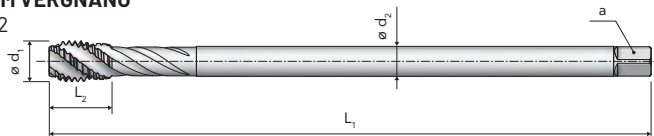
## NORM VERGNANO

≤ M10



## NORM VERGNANO

≥ M12



## APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A70 L<br>BRIGHT | A70 L<br>TiN |  |  |
|-----|-----|-----------------|--------------|--|--|
| P   | P.1 | • 12-15         | • 25-30      |  |  |
|     | P.2 | • 10-15         | • 20-25      |  |  |
| N   | N.1 | • 12-15         |              |  |  |
|     | N.2 | • 12-15         | • 25-30      |  |  |
|     | N.5 | • 10-12         |              |  |  |
|     | N.6 | • 10-12         | • 20-25      |  |  |

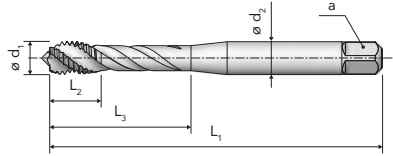
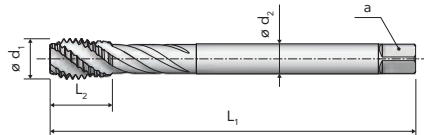
ISO2  
6HISO2  
6H

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A70 L<br>BRIGHT<br>...0702L1AA0 | A70 L<br>TiN<br>...0702L1AD0 |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|---------------------------------|------------------------------|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                 |                              |  |  |
| <b>M 2</b>      | 0,4  | 90                      | 6              | 12             | 2,8                   | 2,1      | 3   | 1,6  | A00020...                       | A00020...                    |  |  |
| <b>2,5</b>      | 0,45 | 100                     | 6,5            | 15             | 2,8                   | 2,1      | 3   | 2,05 | A00025...                       | A00025...                    |  |  |
| <b>3</b>        | 0,5  | 112                     | 7              | 15             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                       | A00030...                    |  |  |
| <b>4</b>        | 0,7  | 112                     | 8,5            | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                       | A00040...                    |  |  |
| <b>5</b>        | 0,8  | 125                     | 10             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                       | A00050...                    |  |  |
| <b>6</b>        | 1    | 125                     | 12             | 29             | 6                     | 4,9      | 3   | 5    | A00060...                       | A00060...                    |  |  |
| <b>8</b>        | 1,25 | 140                     | 15             | 33             | 8                     | 6,2      | 3   | 6,8  | A00080...                       | A00080...                    |  |  |
| <b>10</b>       | 1,5  | 160                     | 17,5           | 38             | 10                    | 8        | 3   | 8,5  | A00100...                       | A00100...                    |  |  |
| <b>12</b>       | 1,75 | 180                     | 18             | -              | 9                     | 7        | 4   | 10,2 | A00120...                       | A00120...                    |  |  |
| <b>16</b>       | 2    | 200                     | 20,5           | -              | 12                    | 9        | 4   | 14   | A00160...                       | A00160...                    |  |  |
| <b>20</b>       | 2,5  | 225                     | 29,5           | -              | 16                    | 12       | 4   | 17,5 | A00200...                       | A00200...                    |  |  |


**A120**  
BRIGHT

**A120**  
VAP

**A120**  
TiN

**DIN 371**  
≤ M10

**DIN 376**  
≥ M12


A SERIES

APPLICATION RANGE - CUTTING SPEED m/min

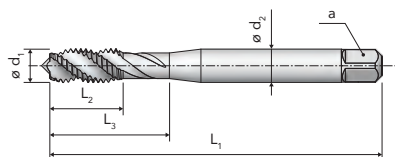
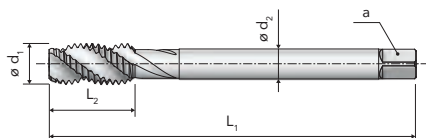
| ISO | MG  | A120<br>BRIGHT | A120<br>VAP | A120<br>TiN |
|-----|-----|----------------|-------------|-------------|
| P   | P.1 | • 12-15        | • 12-15     | • 25-30     |
|     | P.2 | • 10-15        | • 10-15     | • 20-25     |
| N   | N.1 | • 12-15        | • 12-15     |             |
|     | N.2 | • 12-15        | • 12-15     | • 25-30     |
|     | N.5 | • 10-12        | • 10-12     |             |
|     | N.6 | • 10-12        | • 10-12     | • 20-25     |

ISO2  
6H

ISO2  
6H

ISO2  
6H


| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A120<br>BRIGHT<br>...1202A1AA0 | A120<br>VAP<br>...1202A1AB0 | A120<br>TiN<br>...1202A1AD0 |
|-----------------|------|------------------------|----------------|----------------|-----------------------|----------|-----|------|--------------------------------|-----------------------------|-----------------------------|
| [mm]            | [mm] | [mm]                   | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                |                             |                             |
| M 2             | 0,4  | 45                     | 6              | 14             | 2,8                   | 2,1      | 3   | 1,6  | A00020...                      | A00020...                   | A00020...                   |
| 2,5             | 0,45 | 50                     | 6              | 18             | 2,8                   | 2,1      | 3   | 2,05 | A00025...                      | A00025...                   | A00025...                   |
| 3               | 0,5  | 56                     | 6              | 21             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                      | A00030...                   | A00030...                   |
| 4               | 0,7  | 63                     | 6,5            | 27             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                      | A00040...                   | A00040...                   |
| 5               | 0,8  | 70                     | 8              | 30             | 6                     | 4,9      | 3   | 4,2  | A00050...                      | A00050...                   | A00050...                   |
| 6               | 1    | 80                     | 9              | 34,5           | 6                     | 4,9      | 3   | 5    | A00060...                      | A00060...                   | A00060...                   |
| 8               | 1,25 | 90                     | 12             | 38,5           | 8                     | 6,2      | 3   | 6,8  | A00080...                      | A00080...                   | A00080...                   |
| 10              | 1,5  | 100                    | 14             | 43             | 10                    | 8        | 3   | 8,5  | A00100...                      | A00100...                   | A00100...                   |
| 12              | 1,75 | 110                    | 18             | -              | 9                     | 7        | 3   | 10,2 | A00120...                      | A00120...                   | A00120...                   |
| 14              | 2    | 110                    | 20,5           | -              | 11                    | 9        | 3   | 12   | A00140...                      | A00140...                   | A00140...                   |
| 16              | 2    | 110                    | 19,5           | -              | 12                    | 9        | 3   | 14   | A00160...                      | A00160...                   | A00160...                   |
| 18              | 2,5  | 125                    | 25             | -              | 14                    | 11       | 3   | 15,5 | A00180...                      | A00180...                   | A00180...                   |
| 20              | 2,5  | 140                    | 27             | -              | 16                    | 12       | 3   | 17,5 | A00200...                      | A00200...                   | A00200...                   |
| 22              | 2,5  | 140                    | 29             | -              | 18                    | 14,5     | 3   | 19,5 | A00220...                      | A00220...                   | A00220...                   |
| 24              | 3    | 160                    | 34             | -              | 18                    | 14,5     | 3   | 21   | A00240...                      | A00240...                   | A00240...                   |

A170  
VAPA170  
TiX2A  
SERIESDIN 371  
≤ M10DIN 376  
≥ M12

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A170<br>VAP | A170<br>TiX2 |  |  |
|-----|-----|-------------|--------------|--|--|
| P   | P.7 | • 6-8       | • 8-10       |  |  |
| M   | M.1 | • 6-8       | • 8-10       |  |  |

6HX

6HX



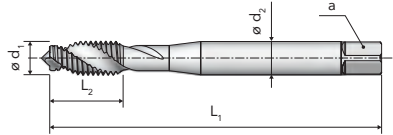
| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A170<br>VAP<br>...1702A1AB0 | A170<br>TiX2<br>...1702A1AL0 |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|-----------------------------|------------------------------|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                             |                              |  |  |
| M 3             | 0,5  | 56                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                   | A00030...                    |  |  |
| 4               | 0,7  | 63                      | 12             | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                   | A00040...                    |  |  |
| 5               | 0,8  | 70                      | 14             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                   | A00050...                    |  |  |
| 6               | 1    | 80                      | 16             | 29             | 6                     | 4,9      | 3   | 5    | A00060...                   | A00060...                    |  |  |
| 8               | 1,25 | 90                      | 18             | 33             | 8                     | 6,2      | 3   | 6,8  | A00080...                   | A00080...                    |  |  |
| 10              | 1,5  | 100                     | 20             | 36             | 10                    | 8        | 3   | 8,5  | A00100...                   | A00100...                    |  |  |
| 12              | 1,75 | 110                     | 24             | -              | 9                     | 7        | 3   | 10,2 | A00120...                   | A00120...                    |  |  |
| 14              | 2    | 110                     | 25             | -              | 11                    | 9        | 4   | 12   | A00140...                   | A00140...                    |  |  |
| 16              | 2    | 110                     | 28             | -              | 12                    | 9        | 4   | 14   | A00160...                   | A00160...                    |  |  |
| 18              | 2,5  | 125                     | 32             | -              | 14                    | 11       | 4   | 15,5 | A00180...                   | A00180...                    |  |  |
| 20              | 2,5  | 140                     | 32             | -              | 16                    | 12       | 4   | 17,5 | A00200...                   | A00200...                    |  |  |



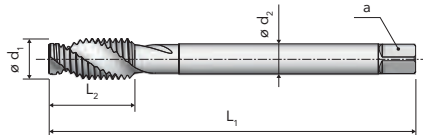
**A62**  
BRIGHT

**A62**  
TiH1

**DIN 371**  
≤ M10



**DIN 376**  
≥ M11



APPLICATION RANGE - CUTTING SPEED m/min

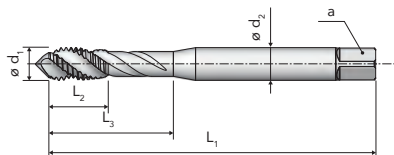
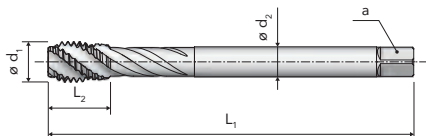
| ISO | MG    | A62<br>BRIGHT | A62<br>TiH1 |  |  |
|-----|-------|---------------|-------------|--|--|
| N   | N.1-2 | • 12-15       | • 25-30     |  |  |
|     | N.5-6 | • 10-12       | • 20-25     |  |  |
| S   | S.1   | • 6-8         | • 10-12     |  |  |
|     | S.3   | • 6-8         | • 10-12     |  |  |

ISO2  
6H

ISO2  
6H



| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A62<br>BRIGHT<br>...0622A1AA0 | A62<br>TiH1<br>...0622A1AH0 |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|-------------------------------|-----------------------------|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                               |                             |  |  |
| <b>M 2</b>      | 0,4  | 45                      | 7              | 11             | 2,8                   | 2,1      | 2   | 1,6  | A00020...                     | A00020...                   |  |  |
| <b>2,2</b>      | 0,45 | 45                      | 8              | 13             | 2,8                   | 2,1      | 2   | 1,75 | A00022...                     | A00022...                   |  |  |
| <b>2,3</b>      | 0,4  | 45                      | 8              | 13             | 2,8                   | 2,1      | 2   | 1,9  | A00023...                     | A00023...                   |  |  |
| <b>2,5</b>      | 0,45 | 50                      | 9              | 15             | 2,8                   | 2,1      | 2   | 2,05 | A00025...                     | A00025...                   |  |  |
| <b>2,6</b>      | 0,45 | 50                      | 9              | 15             | 2,8                   | 2,1      | 2   | 2,1  | A00026...                     | A00026...                   |  |  |
| <b>3</b>        | 0,5  | 56                      | 10             | 18             | 3,5                   | 2,7      | 2   | 2,5  | A00030...                     | A00030...                   |  |  |
| <b>3,5</b>      | 0,6  | 56                      | 11             | 20             | 4                     | 3        | 2   | 2,9  | A00035...                     | A00035...                   |  |  |
| <b>4</b>        | 0,7  | 63                      | 12             | 21             | 4,5                   | 3,4      | 2   | 3,3  | A00040...                     | A00040...                   |  |  |
| <b>5</b>        | 0,8  | 70                      | 14             | 24,5           | 6                     | 4,9      | 2   | 4,2  | A00050...                     | A00050...                   |  |  |
| <b>6</b>        | 1    | 80                      | 16             | 29             | 6                     | 4,9      | 2   | 5    | A00060...                     | A00060...                   |  |  |
| <b>7</b>        | 1    | 80                      | 16             | 29             | 7                     | 5,5      | 2   | 6    | A00070...                     | A00070...                   |  |  |
| <b>8</b>        | 1,25 | 90                      | 18             | 33             | 8                     | 6,2      | 2   | 6,8  | A00080...                     | A00080...                   |  |  |
| <b>9</b>        | 1,25 | 90                      | 18             | 33             | 9                     | 7        | 2   | 7,8  | A00090...                     | A00090...                   |  |  |
| <b>10</b>       | 1,5  | 100                     | 20             | 36             | 10                    | 8        | 2   | 8,5  | A00100...                     | A00100...                   |  |  |
| <b>11</b>       | 1,5  | 100                     | 20             | -              | 8                     | 6,2      | 2   | 9,5  | A00110...                     | A00110...                   |  |  |
| <b>12</b>       | 1,75 | 110                     | 24             | -              | 9                     | 7        | 2   | 10,2 | A00120...                     | A00120...                   |  |  |
| <b>14</b>       | 2    | 110                     | 25             | -              | 11                    | 9        | 2   | 12   | A00140...                     | A00140...                   |  |  |
| <b>16</b>       | 2    | 110                     | 28             | -              | 12                    | 9        | 3   | 14   | A00160...                     | A00160...                   |  |  |

A72  
BRIGHTA72  
TiH1A  
SERIESDIN 371  
≤ M10DIN 376  
≥ M12

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A72<br>BRIGHT | A72<br>TiH1 |  |  |
|-----|-------|---------------|-------------|--|--|
| P   | P.1   | ● 12-15       | ● 25-30     |  |  |
| N   | N.1-2 | ● 12-15       | ● 25-30     |  |  |
|     | N.3   | ● 10-12       | ● 20-25     |  |  |
|     | N.5-6 | ● 10-12       | ● 20-25     |  |  |

ISO2  
6HISO2  
6H

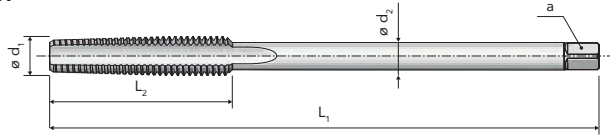
| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A72<br>BRIGHT<br>...0722A1AA0 | A72<br>TiH1<br>...0722A1AH0 |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|-------------------------------|-----------------------------|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                               |                             |  |  |
| M 3             | 0,5  | 56                      | 7              | 15             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                     | A00030...                   |  |  |
| 4               | 0,7  | 63                      | 8,5            | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                     | A00040...                   |  |  |
| 5               | 0,8  | 70                      | 10             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                     | A00050...                   |  |  |
| 6               | 1    | 80                      | 12             | 29             | 6                     | 4,9      | 3   | 5    | A00060...                     | A00060...                   |  |  |
| 8               | 1,25 | 90                      | 15             | 33             | 8                     | 6,2      | 3   | 6,8  | A00080...                     | A00080...                   |  |  |
| 10              | 1,5  | 100                     | 17,5           | 38             | 10                    | 8        | 3   | 8,5  | A00100...                     | A00100...                   |  |  |
| 12              | 1,75 | 110                     | 18             | -              | 9                     | 7        | 3   | 10,2 | A00120...                     | A00120...                   |  |  |
| 14              | 2    | 110                     | 20,5           | -              | 11                    | 9        | 3   | 12   | A00140...                     | A00140...                   |  |  |
| 16              | 2    | 110                     | 20,5           | -              | 12                    | 9        | 3   | 14   | A00160...                     | A00160...                   |  |  |
| 18              | 2,5  | 125                     | 25,5           | -              | 14                    | 11       | 3   | 15,5 | A00180...                     | A00180...                   |  |  |
| 20              | 2,5  | 140                     | 29,5           | -              | 16                    | 12       | 3   | 17,5 | A00200...                     | A00200...                   |  |  |



HSSE

**A9**  
BRIGHT

DIN 357



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A9<br>BRIGHT |  |  |  |
|-----|-----|--------------|--|--|--|
| P   | P.1 | ● 18-20      |  |  |  |
|     | P.2 | ● 15-18      |  |  |  |
|     | P.3 | ● 12-15      |  |  |  |

ISO2  
6H



RH

[illegible]

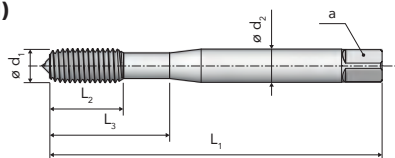


**HSSE**

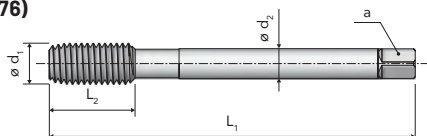
**A80**  
TiN

**A80 6GX**  
TiN

**DIN 2174 (371)**  
≤ M10



**DIN 2174 (376)**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A80<br>TIN | A80 6GX<br>TIN |  |  |
|-----|-------|------------|----------------|--|--|
| P   | P.1-2 | ● 20-25    | ● 20-25        |  |  |
|     | P.3   | ● 15-20    | ● 15-20        |  |  |
| N   | N.1-2 | ● 20-25    | ● 20-25        |  |  |
|     | N.3   | ● 15-20    | ● 15-20        |  |  |
|     | N.5-6 | ● 20-25    | ● 20-25        |  |  |

6HX

6GX

[illegible]

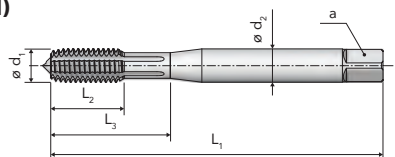


HSSE

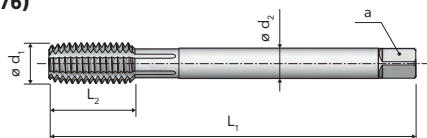
**A80 N**  
TiN

**A80 N 6GX**  
TiN

**DIN 2174 (371)**  
≤ M10



**DIN 2174 (376)**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A80 N<br>TiN | A80 N 6GX<br>TiN |  |  |
|-----|-------|--------------|------------------|--|--|
| P   | P.1-2 | ● 20-25      | ● 20-25          |  |  |
|     | P.3   | ● 15-20      | ● 15-20          |  |  |
| N   | N.1-2 | ● 20-25      | ● 20-25          |  |  |
|     | N.3   | ● 15-20      | ● 15-20          |  |  |
|     | N.5-6 | ● 20-25      | ● 20-25          |  |  |

6HX

6GX



2,5xD

2,5xD

[illegible]

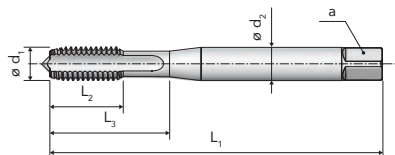


**HSSE**

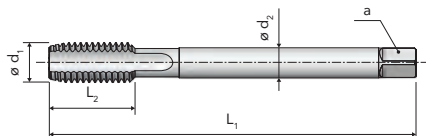
**A190**  
BRIGHT

A  
SERIES

**DIN 40435**  
≤ EG-M8



**DIN 40435**  
≥ EG-M10



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A190<br>BRIGHT |  |  |  |
|-----|-----|----------------|--|--|--|
| P   | P.2 | ● 10-12        |  |  |  |
|     | P.3 | ● 8-10         |  |  |  |
| K   | K.2 | ● 8-10         |  |  |  |

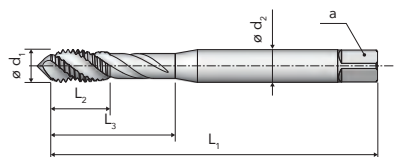
6H  
mod[illegible]



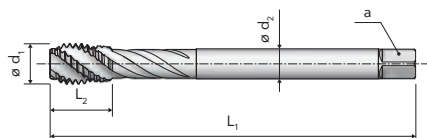
**A195**  
BRIGHT

**A195**  
TiN

**DIN 40435**  
≤ EG-M8



**DIN 40435**  
≥ EG-M10

A  
SERIES

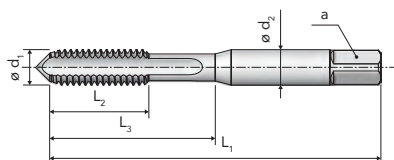
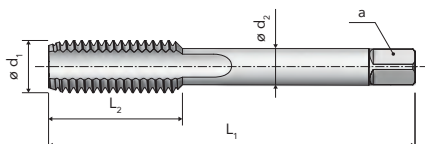
APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A195<br>BRIGHT | A195<br>TIN |  |  |
|-----|-----|----------------|-------------|--|--|
| P   | P.2 | ● 15-20        | ● 25-30     |  |  |
|     | P.3 | ● 12-15        | ● 20-25     |  |  |
|     | P.4 | ● 10-12        | ● 15-20     |  |  |
|     | P.5 |                | ● 5-10      |  |  |
|     | P.7 |                | ● 6-8       |  |  |
| M   | M.1 |                | ● 6-8       |  |  |
| K   | K.2 | ● 12-15        | ● 20-25     |  |  |
| N   | N.3 | ● 15-18        | ● 25-30     |  |  |
|     | N.6 | ● 15-18        | ● 25-30     |  |  |

6H  
mod6H  
mod



HSS

A2  
ROUGHINGA2  
FINISHINGA2  
SETDIN 2181  
≤ M6DIN 2181  
≥ M7

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A2<br>ROUGHING | A2<br>FINISHING | A2<br>SET |
|-----|-------|----------------|-----------------|-----------|
| P   | P.1-4 | •              | •               | •         |
|     | P.7   | •              | •               | •         |
| K   | K.2   | •              | •               | •         |
| N   | N.1-3 | •              | •               | •         |
|     | N.5-7 | •              | •               | •         |



| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A2<br>ROUGHING<br>...0021A1AA0 | A2<br>FINISHING<br>...0021A3AA0 | A2<br>SET<br>...0021ASAA0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|--------------------------------|---------------------------------|---------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                |                                 |                           |
| M 2             | 0,25 | 36                      | 7,5            | 12             | 2,8                   | 2,1      | 3   | 1,75 | A02025...                      | A02025...                       | A02025...                 |
| 2,3             | 0,25 | 36                      | 8,5            | 13,5           | 2,8                   | 2,1      | 3   | 2,05 | A02325...                      | A02325...                       | A02325...                 |
| 2,5             | 0,35 | 40                      | 8,5            | 14,5           | 2,8                   | 2,1      | 3   | 2,15 | A02535...                      | A02535...                       | A02535...                 |
| 2,6             | 0,35 | 40                      | 8,5            | 14,5           | 2,8                   | 2,1      | 3   | 2,25 | A02635...                      | A02635...                       | A02635...                 |
| 3               | 0,35 | 40                      | 8              | 18             | 3,5                   | 2,7      | 3   | 2,65 | A03035...                      | A03035...                       | A03035...                 |
| 3,5             | 0,35 | 45                      | 9              | 19             | 4                     | 3        | 3   | 3,15 | A03535...                      | A03535...                       | A03535...                 |
| 4               | 0,5  | 45                      | 10             | 21             | 4,5                   | 3,4      | 3   | 3,5  | A04050...                      | A04050...                       | A04050...                 |
| 4,5             | 0,5  | 50                      | 12             | 23             | 6                     | 4,9      | 3   | 4    | A04550...                      | A04550...                       | A04550...                 |
| 5               | 0,5  | 50                      | 12             | 24             | 6                     | 4,9      | 3   | 4,5  | A05050...                      | A05050...                       | A05050...                 |
| 6               | 0,5  | 56                      | 14             | 28             | 6                     | 4,9      | 3   | 5,5  | A06050...                      | A06050...                       | A06050...                 |
| 6               | 0,75 | 56                      | 14             | 28             | 6                     | 4,9      | 3   | 5,2  | A06075...                      | A06075...                       | A06075...                 |
| 7               | 0,75 | 56                      | 14             | -              | 6                     | 4,9      | 3   | 6,2  | A07075...                      | A07075...                       | A07075...                 |
| 8               | 0,75 | 56                      | 18             | -              | 6                     | 4,9      | 3   | 7,2  | A08075...                      | A08075...                       | A08075...                 |
| 8               | 1    | 63                      | 22             | -              | 6                     | 4,9      | 3   | 7    | A08100...                      | A08100...                       | A08100...                 |
| 9               | 1    | 63                      | 22             | -              | 7                     | 5,5      | 3   | 8    | A09100...                      | A09100...                       | A09100...                 |
| 10              | 0,75 | 63                      | 20             | -              | 7                     | 5,5      | 4   | 9,2  | A10075...                      | A10075...                       | A10075...                 |
| 10              | 1    | 63                      | 20             | -              | 7                     | 5,5      | 4   | 9    | A10100...                      | A10100...                       | A10100...                 |
| 10              | 1,25 | 70                      | 24             | -              | 7                     | 5,5      | 3   | 8,8  | A10125...                      | A10125...                       | A10125...                 |
| 11              | 1    | 63                      | 20             | -              | 8                     | 6,2      | 4   | 10   | A11100...                      | A11100...                       | A11100...                 |
| 12              | 0,75 | 70                      | 22             | -              | 9                     | 7        | 4   | 11,2 | A12075...                      | A12075...                       | A12075...                 |
| 12              | 1    | 70                      | 22             | -              | 9                     | 7        | 4   | 11   | A12100...                      | A12100...                       | A12100...                 |
| 12              | 1,25 | 70                      | 22             | -              | 9                     | 7        | 4   | 10,8 | A12125...                      | A12125...                       | A12125...                 |
| 12              | 1,5  | 70                      | 22             | -              | 9                     | 7        | 4   | 10,5 | A12150...                      | A12150...                       | A12150...                 |
| 14              | 1    | 70                      | 22             | -              | 11                    | 9        | 4   | 13   | A14100...                      | A14100...                       | A14100...                 |
| 14              | 1,25 | 70                      | 22             | -              | 11                    | 9        | 4   | 12,8 | A14125...                      | A14125...                       | A14125...                 |
| 14              | 1,5  | 70                      | 22             | -              | 11                    | 9        | 4   | 12,5 | A14150...                      | A14150...                       | A14150...                 |

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### HAND TAPS for blind and through holes In sets of two pieces

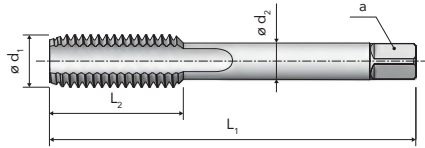


**A2**  
ROUGHING

**A2**  
FINISHING

**A2**  
SET

DIN 2181



#### APPLICATION RANGE - CUTTING SPEED m/min

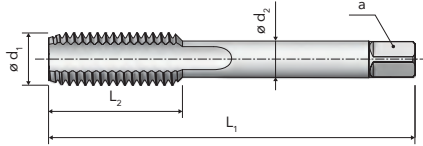
| ISO | MG    | A2<br>ROUGHING | A2<br>FINISHING | A2<br>SET |
|-----|-------|----------------|-----------------|-----------|
| P   | P.1-4 | •              | •               | •         |
|     | P.7   | •              | •               | •         |
| K   | K.2   | •              | •               | •         |
| N   | N.1-3 | •              | •               | •         |
|     | N.5-7 | •              | •               | •         |



| Ød <sub>1</sub><br>[mm] | P<br>[mm] | L <sub>1</sub><br>js16<br>[mm] | L <sub>2</sub><br>[mm] | L <sub>3</sub><br>[mm] | Ød <sub>2</sub><br>h9<br>[mm] | a<br>h12<br>[mm] | z |      | A2<br>ROUGHING<br>...0021A1AA0 | A2<br>FINISHING<br>...0021A3AA0 | A2<br>SET<br>...0021ASAA0 |
|-------------------------|-----------|--------------------------------|------------------------|------------------------|-------------------------------|------------------|---|------|--------------------------------|---------------------------------|---------------------------|
| M 15                    | 1         | 70                             | 22                     | -                      | 12                            | 9                | 4 | 14   | A15100...                      | A15100...                       | A15100...                 |
| 15                      | 1,5       | 70                             | 22                     | -                      | 12                            | 9                | 4 | 13,5 | A15150...                      | A15150...                       | A15150...                 |
| 16                      | 1         | 70                             | 22                     | -                      | 12                            | 9                | 4 | 15   | A16100...                      | A16100...                       | A16100...                 |
| 16                      | 1,25      | 70                             | 22                     | -                      | 12                            | 9                | 4 | 14,8 | A16125...                      | A16125...                       | A16125...                 |
| 16                      | 1,5       | 70                             | 22                     | -                      | 12                            | 9                | 4 | 14,5 | A16150...                      | A16150...                       | A16150...                 |
| 18                      | 1         | 80                             | 22                     | -                      | 14                            | 11               | 4 | 17   | A18100...                      | A18100...                       | A18100...                 |
| 18                      | 1,5       | 80                             | 22                     | -                      | 14                            | 11               | 4 | 16,5 | A18150...                      | A18150...                       | A18150...                 |
| 18                      | 2         | 80                             | 22                     | -                      | 14                            | 11               | 4 | 16   | A18200...                      | A18200...                       | A18200...                 |
| 20                      | 1         | 80                             | 22                     | -                      | 16                            | 12               | 4 | 19   | A20100...                      | A20100...                       | A20100...                 |
| 20                      | 1,5       | 80                             | 22                     | -                      | 16                            | 12               | 4 | 18,5 | A20150...                      | A20150...                       | A20150...                 |
| 20                      | 2         | 80                             | 22                     | -                      | 16                            | 12               | 4 | 18   | A20200...                      | A20200...                       | A20200...                 |
| 22                      | 1         | 80                             | 22                     | -                      | 18                            | 14,5             | 4 | 21   | A22100...                      | A22100...                       | A22100...                 |
| 22                      | 1,5       | 80                             | 22                     | -                      | 18                            | 14,5             | 4 | 20,5 | A22150...                      | A22150...                       | A22150...                 |
| 22                      | 2         | 80                             | 22                     | -                      | 18                            | 14,5             | 4 | 20   | A22200...                      | A22200...                       | A22200...                 |
| 24                      | 1         | 90                             | 22                     | -                      | 18                            | 14,5             | 4 | 23   | A24100...                      | A24100...                       | A24100...                 |
| 24                      | 1,5       | 90                             | 22                     | -                      | 18                            | 14,5             | 4 | 22,5 | A24150...                      | A24150...                       | A24150...                 |
| 24                      | 2         | 90                             | 22                     | -                      | 18                            | 14,5             | 4 | 22   | A24200...                      | A24200...                       | A24200...                 |
| 25                      | 1,5       | 90                             | 22                     | -                      | 18                            | 14,5             | 4 | 23,5 | A25150...                      | A25150...                       | A25150...                 |
| 25                      | 2         | 90                             | 22                     | -                      | 18                            | 14,5             | 4 | 23   | A25200...                      | A25200...                       | A25200...                 |
| 26                      | 1,5       | 90                             | 22                     | -                      | 18                            | 14,5             | 4 | 24,5 | A26150...                      | A26150...                       | A26150...                 |
| 26                      | 2         | 90                             | 22                     | -                      | 18                            | 14,5             | 4 | 24   | A26200...                      | A26200...                       | A26200...                 |
| 27                      | 1,5       | 90                             | 22                     | -                      | 20                            | 16               | 4 | 25,5 | A27150...                      | A27150...                       | A27150...                 |
| 27                      | 2         | 90                             | 22                     | -                      | 20                            | 16               | 4 | 25   | A27200...                      | A27200...                       | A27200...                 |
| 28                      | 1,5       | 90                             | 22                     | -                      | 20                            | 16               | 4 | 26,5 | A28150...                      | A28150...                       | A28150...                 |
| 28                      | 2         | 90                             | 22                     | -                      | 20                            | 16               | 4 | 26   | A28200...                      | A28200...                       | A28200...                 |
| 30                      | 1,5       | 90                             | 22                     | -                      | 22                            | 18               | 4 | 28,5 | A30150...                      | A30150...                       | A30150...                 |

A2  
ROUGHINGA2  
FINISHINGA2  
SET

DIN 2181



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A2<br>ROUGHING | A2<br>FINISHING | A2<br>SET |
|-----|-------|----------------|-----------------|-----------|
| P   | P.1-4 | •              | •               | •         |
|     | P.7   | •              | •               | •         |
| K   | K.2   | •              | •               | •         |
| N   | N.1-3 | •              | •               | •         |
|     | N.5-7 | •              | •               | •         |



«

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A2<br>ROUGHING<br>...0021A1AA0 | A2<br>FINISHING<br>...0021A3AA0 | A2<br>SET<br>...0021ASAA0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|--------------------------------|---------------------------------|---------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                |                                 |                           |
| M 30            | 2    | 90                      | 22             | -              | 22                    | 18       | 4   | 28   | A30200...                      | A30200...                       | A30200...                 |
| 32              | 1,5  | 90                      | 22             | -              | 22                    | 18       | 5   | 30,5 | A32150...                      | A32150...                       | A32150...                 |
| 32              | 2    | 90                      | 22             | -              | 22                    | 18       | 4   | 30   | A32200...                      | A32200...                       | A32200...                 |
| 33              | 2    | 100                     | 25             | -              | 25                    | 20       | 4   | 31   | A33200...                      | A33200...                       | A33200...                 |
| 35              | 1,5  | 100                     | 25             | -              | 28                    | 22       | 5   | 33,5 | A35150...                      | A35150...                       | A35150...                 |
| 35              | 2    | 125                     | 30             | -              | 28                    | 22       | 5   | 33   | A35200...                      | A35200...                       | A35200...                 |
| 36              | 1,5  | 100                     | 25             | -              | 28                    | 22       | 5   | 34,5 | A36150...                      | A36150...                       | A36150...                 |
| 36              | 2    | 125                     | 30             | -              | 28                    | 22       | 5   | 34   | A36200...                      | A36200...                       | A36200...                 |
| 36              | 3    | 125                     | 40             | -              | 28                    | 22       | 4   | 33   | A36300...                      | A36300...                       | A36300...                 |
| 38              | 1,5  | 100                     | 25             | -              | 28                    | 22       | 5   | 36,5 | A38150...                      | A38150...                       | A38150...                 |
| 39              | 2    | 125                     | 32             | -              | 32                    | 24       | 5   | 37   | A39200...                      | A39200...                       | A39200...                 |
| 39              | 3    | 125                     | 40             | -              | 32                    | 24       | 4   | 36   | A39300...                      | A39300...                       | A39300...                 |
| 40              | 1,5  | 110                     | 25             | -              | 32                    | 24       | 6   | 38,5 | A40150...                      | A40150...                       | A40150...                 |
| 40              | 2    | 125                     | 32             | -              | 32                    | 24       | 5   | 38   | A40200...                      | A40200...                       | A40200...                 |
| 40              | 3    | 125                     | 40             | -              | 32                    | 24       | 4   | 37   | A40300...                      | A40300...                       | A40300...                 |
| 42              | 1,5  | 110                     | 25             | -              | 32                    | 24       | 6   | 40,5 | A42150...                      | A42150...                       | A42150...                 |
| 42              | 2    | 125                     | 32             | -              | 32                    | 24       | 5   | 40   | A42200...                      | A42200...                       | A42200...                 |
| 42              | 3    | 125                     | 40             | -              | 32                    | 24       | 4   | 39   | A42300...                      | A42300...                       | A42300...                 |
| 45              | 1,5  | 110                     | 25             | -              | 36                    | 29       | 6   | 43,5 | A45150...                      | A45150...                       | A45150...                 |
| 45              | 2    | 125                     | 32             | -              | 36                    | 29       | 5   | 43   | A45200...                      | A45200...                       | A45200...                 |
| 45              | 3    | 125                     | 40             | -              | 36                    | 29       | 5   | 42   | A45300...                      | A45300...                       | A45300...                 |
| 48              | 1,5  | 140                     | 25             | -              | 36                    | 29       | 6   | 46,5 | A48150...                      | A48150...                       | A48150...                 |
| 48              | 2    | 140                     | 32             | -              | 36                    | 29       | 6   | 46   | A48200...                      | A48200...                       | A48200...                 |
| 48              | 3    | 140                     | 40             | -              | 36                    | 29       | 5   | 45   | A48300...                      | A48300...                       | A48300...                 |

HAND TAPS for blind and through holes  
In sets of two pieces



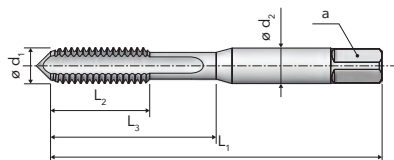
HSS

**A2 LH**  
ROUGHING

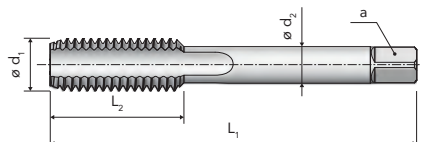
## A2 LH FINISHING

**A2 LH**  
SET

**DIN 2181**  
≤ M6



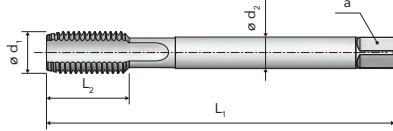
**DIN 2181**  
≥ M8



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A2 LH<br>ROUGHING | A2 LH<br>FINISHING | A2 LH<br>SET |  |
|-----|-------|-------------------|--------------------|--------------|--|
| P   | P.1-4 | ●                 | ●                  | ●            |  |
|     | P.7   | ●                 | ●                  | ●            |  |
| K   | K.2   | ●                 | ●                  | ●            |  |
| N   | N.1-3 | ●                 | ●                  | ●            |  |
|     | N.5-7 | ●                 | ●                  | ●            |  |

[illegible]

**A23 FC**  
BRIGHT**A23 FC**  
TiN**A23 FC LH**  
BRIGHT**DIN 374**

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A23 FC<br>BRIGHT | A23 FC<br>TiN | A23 FC LH<br>BRIGHT |
|-----|-----|------------------|---------------|---------------------|
| P   | P.1 |                  | • 20-25       |                     |
|     | P.2 | • 10-12          | • 15-20       | • 10-12             |
|     | P.3 | • 8-10           | • 12-15       | • 8-10              |
| K   | K.2 | • 8-10           | • 12-15       | • 8-10              |
| N   | N.1 |                  | • 20-25       |                     |
|     | N.5 |                  | • 15-20       |                     |

**ISO2**  
**6H****ISO2**  
**6H****ISO2**  
**6H**

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A23 FC<br>BRIGHT<br>...0232A1AA0 | A23 FC<br>TiN<br>...0232A1AD0 | A23 FC LH<br>BRIGHT<br>...0232C1AA0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|----------------------------------|-------------------------------|-------------------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                  |                               |                                     |
| <b>M 3</b>      | 0,35 | 56                      | 8              | -              | 2,2                   | -        | 3   | 2,65 | A03035...                        |                               |                                     |
| <b>3,5</b>      | 0,35 | 56                      | 9              | -              | 2,5                   | 2,1      | 3   | 3,15 | A03535...                        |                               |                                     |
| <b>4</b>        | 0,5  | 63                      | 12             | -              | 2,8                   | 2,1      | 3   | 3,5  | A04050...                        |                               |                                     |
| <b>5</b>        | 0,5  | 70                      | 14             | -              | 3,5                   | 2,7      | 3   | 4,5  | A05050...                        |                               |                                     |
| <b>6</b>        | 0,5  | 80                      | 16             | -              | 4,5                   | 3,4      | 3   | 5,5  | A06050...                        | A06050...                     |                                     |
| <b>6</b>        | 0,75 | 80                      | 16             | -              | 4,5                   | 3,4      | 3   | 5,2  | A06075...                        | A06075...                     | A06075...                           |
| <b>7</b>        | 0,75 | 80                      | 16             | -              | 5,5                   | 4,3      | 3   | 6,2  | A07075...                        | A07075...                     |                                     |
| <b>8</b>        | 0,75 | 80                      | 16             | -              | 6                     | 4,9      | 3   | 7,2  | A08075...                        |                               |                                     |
| <b>8</b>        | 1    | 90                      | 16             | -              | 6                     | 4,9      | 3   | 7    | A08100...                        | A08100...                     | A08100...                           |
| <b>9</b>        | 1    | 90                      | 16             | -              | 7                     | 5,5      | 3   | 8    | A09100...                        |                               |                                     |
| <b>10</b>       | 0,5  | 90                      | 18             | -              | 7                     | 5,5      | 4   | 9,5  | A10050...                        | A10050...                     |                                     |
| <b>10</b>       | 0,75 | 90                      | 18             | -              | 7                     | 5,5      | 3   | 9,2  | A10075...                        |                               |                                     |
| <b>10</b>       | 1    | 90                      | 18             | -              | 7                     | 5,5      | 3   | 9    | A10100...                        | A10100...                     | A10100...                           |
| <b>10</b>       | 1,25 | 100                     | 18             | -              | 7                     | 5,5      | 3   | 8,8  | A10125...                        | A10125...                     | A10125...                           |
| <b>11</b>       | 1    | 90                      | 20             | -              | 8                     | 6,2      | 3   | 10   | A11100...                        |                               |                                     |
| <b>12</b>       | 0,75 | 100                     | 22             | -              | 9                     | 7        | 4   | 11,2 | A12075...                        | A12075...                     |                                     |
| <b>12</b>       | 1    | 100                     | 22             | -              | 9                     | 7        | 4   | 11   | A12100...                        | A12100...                     |                                     |
| <b>12</b>       | 1,25 | 100                     | 22             | -              | 9                     | 7        | 3   | 10,8 | A12125...                        | A12125...                     | A12125...                           |
| <b>12</b>       | 1,5  | 100                     | 22             | -              | 9                     | 7        | 3   | 10,5 | A12150...                        | A12150...                     | A12150...                           |
| <b>14</b>       | 1    | 100                     | 22             | -              | 11                    | 9        | 4   | 13   | A14100...                        | A14100...                     |                                     |
| <b>14</b>       | 1,25 | 100                     | 22             | -              | 11                    | 9        | 3   | 12,8 | A14125...                        | A14125...                     |                                     |
| <b>14</b>       | 1,5  | 100                     | 22             | -              | 11                    | 9        | 3   | 12,5 | A14150...                        | A14150...                     | A14150...                           |
| <b>15</b>       | 1    | 100                     | 22             | -              | 12                    | 9        | 4   | 14   | A15100...                        |                               |                                     |
| <b>15</b>       | 1,5  | 100                     | 22             | -              | 12                    | 9        | 3   | 13,5 | A15150...                        |                               |                                     |
| <b>16</b>       | 1    | 100                     | 22             | -              | 12                    | 9        | 4   | 15   | A16100...                        | A16100...                     |                                     |
| <b>16</b>       | 1,25 | 100                     | 22             | -              | 12                    | 9        | 4   | 14,8 | A16125...                        | A16125...                     |                                     |

»

### MACHINE TAPS for blind holes Straight flutes

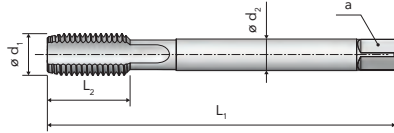


**A23 FC**  
BRIGHT

**A23 FC**  
TiN

**A23 FC LH**  
BRIGHT

DIN 374



#### APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A23 FC<br>BRIGHT | A23 FC<br>TiN | A23 FC LH<br>BRIGHT |
|-----|-----|------------------|---------------|---------------------|
| P   | P.1 |                  | • 20-25       |                     |
|     | P.2 | • 10-12          | • 15-20       | • 10-12             |
|     | P.3 | • 8-10           | • 12-15       | • 8-10              |
| K   | K.2 | • 8-10           | • 12-15       | • 8-10              |
| N   | N.1 |                  | • 20-25       |                     |
|     | N.5 |                  | • 15-20       |                     |

ISO2  
6H



ISO2  
6H

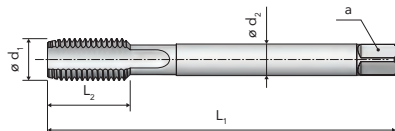


ISO2  
6H



A  
SERIES

| $\phi d_1$ | P    | $L_1$<br>js 16 | $L_2$ | $L_3$ | $\phi d_2$<br>h9 | a<br>h12 | z   |      | A23 FC<br>BRIGHT<br>...0232A1AA0 | A23 FC<br>TiN<br>...0232A1AD0 | A23 FC LH<br>BRIGHT<br>...0232C1AA0 |
|------------|------|----------------|-------|-------|------------------|----------|-----|------|----------------------------------|-------------------------------|-------------------------------------|
| [mm]       | [mm] | [mm]           | [mm]  | [mm]  | [mm]             | [mm]     | [-] | [mm] |                                  |                               |                                     |
| M 16       | 1,5  | 100            | 22    | -     | 12               | 9        | 3   | 14,5 | A16150...                        | A16150...                     | A16150...                           |
| 17         | 1    | 100            | 22    | -     | 12               | 9        | 4   | 16   | A17100...                        |                               |                                     |
| 17         | 1,5  | 100            | 22    | -     | 12               | 9        | 4   | 15,5 | A17150...                        |                               |                                     |
| 18         | 1    | 110            | 25    | -     | 14               | 11       | 4   | 17   | A18100...                        |                               |                                     |
| 18         | 1,5  | 110            | 25    | -     | 14               | 11       | 4   | 16,5 | A18150...                        | A18150...                     | A18150...                           |
| 18         | 2    | 125            | 28    | -     | 14               | 11       | 4   | 16   | A18200...                        |                               |                                     |
| 20         | 1    | 125            | 25    | -     | 16               | 12       | 4   | 19   | A20100...                        |                               |                                     |
| 20         | 1,5  | 125            | 25    | -     | 16               | 12       | 4   | 18,5 | A20150...                        | A20150...                     | A20150...                           |
| 20         | 2    | 140            | 28    | -     | 16               | 12       | 4   | 18   | A20200...                        |                               |                                     |
| 22         | 1    | 125            | 25    | -     | 18               | 14,5     | 4   | 21   | A22100...                        |                               |                                     |
| 22         | 1,5  | 125            | 25    | -     | 18               | 14,5     | 4   | 20,5 | A22150...                        | A22150...                     |                                     |
| 22         | 2    | 140            | 28    | -     | 18               | 14,5     | 4   | 20   | A22200...                        |                               |                                     |
| 24         | 1    | 140            | 25    | -     | 18               | 14,5     | 4   | 23   | A24100...                        |                               |                                     |
| 24         | 1,5  | 140            | 25    | -     | 18               | 14,5     | 4   | 22,5 | A24150...                        |                               |                                     |
| 24         | 2    | 140            | 28    | -     | 18               | 14,5     | 4   | 22   | A24200...                        |                               |                                     |
| 25         | 1    | 140            | 25    | -     | 18               | 14,5     | 4   | 24   | A25100...                        |                               |                                     |
| 25         | 1,5  | 140            | 25    | -     | 18               | 14,5     | 4   | 23,5 | A25150...                        |                               |                                     |
| 25         | 2    | 140            | 28    | -     | 18               | 14,5     | 4   | 23   | A25200...                        |                               |                                     |
| 26         | 1    | 140            | 25    | -     | 18               | 14,5     | 4   | 25   | A26100...                        |                               |                                     |
| 26         | 1,5  | 140            | 25    | -     | 18               | 14,5     | 4   | 24,5 | A26150...                        |                               |                                     |
| 26         | 2    | 140            | 28    | -     | 18               | 14,5     | 4   | 24   | A26200...                        |                               |                                     |
| 27         | 1,5  | 140            | 28    | -     | 20               | 16       | 4   | 25,5 | A27150...                        |                               |                                     |
| 27         | 2    | 140            | 28    | -     | 20               | 16       | 4   | 25   | A27200...                        |                               |                                     |
| 28         | 1,5  | 140            | 28    | -     | 20               | 16       | 4   | 26,5 | A28150...                        |                               |                                     |
| 28         | 2    | 140            | 28    | -     | 20               | 16       | 4   | 26   | A28200...                        |                               |                                     |
| 30         | 1    | 150            | 25    | -     | 22               | 18       | 5   | 29   | A30100...                        |                               |                                     |

**A23 FC**  
BRIGHT**DIN 374**

APPLICATION RANGE - CUTTING SPEED m/min

| ISO      | MG  | A23 FC<br>BRIGHT |  |  |  |
|----------|-----|------------------|--|--|--|
| <b>P</b> | P.2 | • 10-12          |  |  |  |
|          | P.3 | • 8-10           |  |  |  |
| <b>K</b> | K.2 | • 8-10           |  |  |  |

**ISO2**  
**6H**

«

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A23 FC<br>BRIGHT<br>...0232A1AA0 |  |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|----------------------------------|--|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                  |  |  |  |
| <b>M 30</b>     | 1,5  | 150                     | 28             | -              | 22                    | 18       | 4   | 28,5 | A30150...                        |  |  |  |
| <b>30</b>       | 2    | 150                     | 28             | -              | 22                    | 18       | 4   | 28   | A30200...                        |  |  |  |
| <b>32</b>       | 1,5  | 150                     | 28             | -              | 22                    | 18       | 5   | 30,5 | A32150...                        |  |  |  |
| <b>32</b>       | 2    | 150                     | 28             | -              | 22                    | 18       | 4   | 30   | A32200...                        |  |  |  |
| <b>33</b>       | 1,5  | 160                     | 30             | -              | 25                    | 20       | 5   | 31,5 | A33150...                        |  |  |  |
| <b>33</b>       | 2    | 160                     | 30             | -              | 25                    | 20       | 4   | 31   | A33200...                        |  |  |  |
| <b>35</b>       | 1,5  | 170                     | 30             | -              | 28                    | 22       | 5   | 33,5 | A35150...                        |  |  |  |
| <b>35</b>       | 2    | 170                     | 30             | -              | 28                    | 22       | 5   | 33   | A35200...                        |  |  |  |
| <b>36</b>       | 1,5  | 170                     | 30             | -              | 28                    | 22       | 5   | 34,5 | A36150...                        |  |  |  |
| <b>36</b>       | 2    | 170                     | 30             | -              | 28                    | 22       | 5   | 34   | A36200...                        |  |  |  |
| <b>36</b>       | 3    | 200                     | 55             | -              | 28                    | 22       | 4   | 33   | A36300...                        |  |  |  |
| <b>39</b>       | 3    | 200                     | 60             | -              | 32                    | 24       | 5   | 36   | A39300...                        |  |  |  |
| <b>40</b>       | 1,5  | 170                     | 30             | -              | 32                    | 24       | 5   | 38,5 | A40150...                        |  |  |  |
| <b>40</b>       | 2    | 170                     | 30             | -              | 32                    | 24       | 5   | 38   | A40200...                        |  |  |  |
| <b>40</b>       | 3    | 200                     | 60             | -              | 32                    | 24       | 5   | 37   | A40300...                        |  |  |  |
| <b>42</b>       | 1,5  | 170                     | 30             | -              | 32                    | 24       | 6   | 40,5 | A42150...                        |  |  |  |
| <b>42</b>       | 2    | 170                     | 30             | -              | 32                    | 24       | 5   | 40   | A42200...                        |  |  |  |
| <b>42</b>       | 3    | 200                     | 60             | -              | 32                    | 24       | 5   | 39   | A42300...                        |  |  |  |
| <b>45</b>       | 1,5  | 180                     | 32             | -              | 36                    | 29       | 6   | 43,5 | A45150...                        |  |  |  |
| <b>45</b>       | 2    | 180                     | 32             | -              | 36                    | 29       | 5   | 43   | A45200...                        |  |  |  |
| <b>45</b>       | 3    | 200                     | 50             | -              | 36                    | 29       | 5   | 42   | A45300...                        |  |  |  |
| <b>48</b>       | 1,5  | 190                     | 32             | -              | 36                    | 29       | 6   | 46,5 | A48150...                        |  |  |  |
| <b>48</b>       | 2    | 190                     | 32             | -              | 36                    | 29       | 6   | 46   | A48200...                        |  |  |  |
| <b>48</b>       | 3    | 225                     | 50             | -              | 36                    | 29       | 5   | 45   | A48300...                        |  |  |  |
| <b>52</b>       | 1,5  | 190                     | 32             | -              | 40                    | 32       | 6   | 50,5 | A52150...                        |  |  |  |
| <b>52</b>       | 2    | 190                     | 32             | -              | 40                    | 32       | 6   | 50   | A52200...                        |  |  |  |
| <b>52</b>       | 3    | 225                     | 50             | -              | 40                    | 32       | 5   | 49   | A52300...                        |  |  |  |

### MACHINE TAPS for blind and through holes Straight flutes / for cast iron

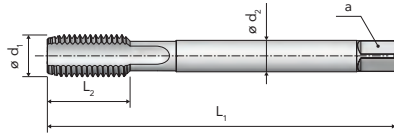


HSSE

**A45**  
NITRIDED

**A45**  
TiCN

DIN 374



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG     | A45<br>NITRIDED | A45<br>TiCN |  |  |
|-----|--------|-----------------|-------------|--|--|
| K   | K.1    | • 15-20         | • 40-45     |  |  |
| N   | N.4    | • 15-20         | • 40-45     |  |  |
|     | N.7    | • 15-20         | • 40-45     |  |  |
|     | N.9-10 | • 20-25         | • 45-50     |  |  |

6HX

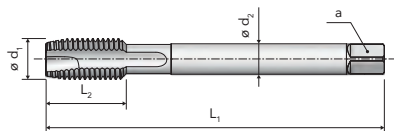
6HX



| $\varnothing d_1$ | P    | $L_1$<br>js16 | $L_2$ | $L_3$ | $\varnothing d_2$<br>h9 | a<br>h12 | z   |      | A45<br>NITRIDED<br>...0452A1AC0 | A45<br>TiCN<br>...0452A1AE0 |  |  |
|-------------------|------|---------------|-------|-------|-------------------------|----------|-----|------|---------------------------------|-----------------------------|--|--|
| [mm]              | [mm] | [mm]          | [mm]  | [mm]  | [mm]                    | [mm]     | [-] | [mm] |                                 |                             |  |  |
| <b>M 4</b>        | 0,5  | 63            | 10    | -     | 2,8                     | 2,1      | 3   | 3,5  | A04050...                       | A04050...                   |  |  |
| <b>5</b>          | 0,5  | 70            | 12    | -     | 3,5                     | 2,7      | 3   | 4,5  | A05050...                       | A05050...                   |  |  |
| <b>6</b>          | 0,75 | 80            | 14    | -     | 4,5                     | 3,4      | 3   | 5,2  | A06075...                       | A06075...                   |  |  |
| <b>8</b>          | 1    | 90            | 16    | -     | 6                       | 4,9      | 4   | 7    | A08100...                       | A08100...                   |  |  |
| <b>9</b>          | 1    | 90            | 16    | -     | 7                       | 5,5      | 4   | 8    | A09100...                       |                             |  |  |
| <b>10</b>         | 1    | 90            | 18    | -     | 7                       | 5,5      | 4   | 9    | A10100...                       | A10100...                   |  |  |
| <b>10</b>         | 1,25 | 100           | 18    | -     | 7                       | 5,5      | 4   | 8,8  | A10125...                       | A10125...                   |  |  |
| <b>11</b>         | 1    | 90            | 20    | -     | 8                       | 6,2      | 4   | 10   | A11100...                       |                             |  |  |
| <b>12</b>         | 1    | 100           | 22    | -     | 9                       | 7        | 4   | 11   | A12100...                       |                             |  |  |
| <b>12</b>         | 1,25 | 100           | 22    | -     | 9                       | 7        | 4   | 10,8 | A12125...                       | A12125...                   |  |  |
| <b>12</b>         | 1,5  | 100           | 22    | -     | 9                       | 7        | 4   | 10,5 | A12150...                       | A12150...                   |  |  |
| <b>14</b>         | 1    | 100           | 22    | -     | 11                      | 9        | 4   | 13   | A14100...                       |                             |  |  |
| <b>14</b>         | 1,25 | 100           | 22    | -     | 11                      | 9        | 4   | 12,8 | A14125...                       | A14125...                   |  |  |
| <b>14</b>         | 1,5  | 100           | 22    | -     | 11                      | 9        | 4   | 12,5 | A14150...                       | A14150...                   |  |  |
| <b>16</b>         | 1    | 100           | 22    | -     | 12                      | 9        | 4   | 15   | A16100...                       |                             |  |  |
| <b>16</b>         | 1,5  | 100           | 22    | -     | 12                      | 9        | 4   | 14,5 | A16150...                       | A16150...                   |  |  |
| <b>18</b>         | 1,5  | 110           | 25    | -     | 14                      | 11       | 4   | 16,5 | A18150...                       | A18150...                   |  |  |
| <b>20</b>         | 1,5  | 125           | 25    | -     | 16                      | 12       | 4   | 18,5 | A20150...                       | A20150...                   |  |  |
| <b>22</b>         | 1,5  | 125           | 25    | -     | 18                      | 14,5     | 4   | 20,5 | A22150...                       |                             |  |  |
| <b>24</b>         | 1,5  | 140           | 25    | -     | 18                      | 14,5     | 5   | 22,5 | A24150...                       |                             |  |  |
| <b>24</b>         | 2    | 140           | 28    | -     | 18                      | 14,5     | 5   | 22   | A24200...                       |                             |  |  |
| <b>27</b>         | 1,5  | 140           | 28    | -     | 20                      | 16       | 5   | 25,5 | A27150...                       |                             |  |  |
| <b>27</b>         | 2    | 140           | 28    | -     | 20                      | 16       | 5   | 25   | A27200...                       |                             |  |  |
| <b>30</b>         | 1,5  | 150           | 28    | -     | 22                      | 18       | 5   | 28,5 | A30150...                       |                             |  |  |
| <b>30</b>         | 2    | 150           | 28    | -     | 22                      | 18       | 5   | 28   | A30200...                       |                             |  |  |

**A17 S**  
BRIGHT**A17 S**  
VAP**A17 S**  
TiN**A17 S**  
TiCN

DIN 374



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A17 S<br>BRIGHT | A17 S<br>VAP | A17 S<br>TiN | A17 S<br>TiCN |
|-----|-------|-----------------|--------------|--------------|---------------|
| P   | P.2   | ● 20-25         | ● 20-25      | ● 30-35      | ● 30-35       |
|     | P.3   | ● 15-20         | ● 15-20      | ● 25-30      | ● 25-30       |
|     | P.4   | ● 12-15         | ● 12-15      | ● 20-25      | ● 20-25       |
|     | P.5   |                 |              | ● 10-15      | ● 10-15       |
| M   | M.1   |                 |              | ● 8-10       | ● 8-10        |
|     | K.2   | ● 15-20         | ● 15-20      | ● 25-30      | ● 25-30       |
| N   | N.2-3 | ● 20-25         | ● 20-25      | ● 30-35      | ● 30-35       |
|     | N.6   | ● 15-18         | ● 15-18      | ● 25-30      | ● 25-30       |

ISO2  
6HISO2  
6HISO2  
6HISO2  
6H

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A17 S<br>BRIGHT<br>...0172B2AA0 | A17 S<br>VAP<br>...0172B2AB0 | A17 S<br>TiN<br>...0172B2AD0 | A17 S<br>TiCN<br>...0172B2AE0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|---------------------------------|------------------------------|------------------------------|-------------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                 |                              |                              |                               |
| M 3             | 0,35 | 56                      | 8              | -              | 2,2                   | -        | 3   | 2,65 | A03035...                       |                              | A03035...                    |                               |
| 4               | 0,5  | 63                      | 12             | -              | 2,8                   | 2,1      | 3   | 3,5  | A04050...                       |                              |                              |                               |
| 5               | 0,5  | 70                      | 14             | -              | 3,5                   | 2,7      | 3   | 4,5  | A05050...                       |                              |                              |                               |
| 6               | 0,5  | 80                      | 16             | -              | 4,5                   | 3,4      | 3   | 5,5  | A06050...                       |                              | A06050...                    |                               |
| 6               | 0,75 | 80                      | 16             | -              | 4,5                   | 3,4      | 3   | 5,2  | A06075...                       | A06075...                    | A06075...                    | A06075...                     |
| 7               | 0,75 | 80                      | 16             | -              | 5,5                   | 4,3      | 3   | 6,2  | A07075...                       |                              |                              |                               |
| 8               | 0,75 | 80                      | 16             | -              | 6                     | 4,9      | 3   | 7,2  | A08075...                       |                              |                              |                               |
| 8               | 1    | 90                      | 16             | -              | 6                     | 4,9      | 3   | 7    | A08100...                       | A08100...                    | A08100...                    | A08100...                     |
| 9               | 1    | 90                      | 16             | -              | 7                     | 5,5      | 3   | 8    | A09100...                       |                              |                              |                               |
| 10              | 0,75 | 90                      | 18             | -              | 7                     | 5,5      | 4   | 9,2  | A10075...                       |                              |                              |                               |
| 10              | 1    | 90                      | 18             | -              | 7                     | 5,5      | 4   | 9    | A10100...                       | A10100...                    | A10100...                    | A10100...                     |
| 10              | 1,25 | 100                     | 18             | -              | 7                     | 5,5      | 3   | 8,8  | A10125...                       | A10125...                    | A10125...                    | A10125...                     |
| 11              | 1    | 90                      | 20             | -              | 8                     | 6,2      | 4   | 10   | A11100...                       |                              |                              |                               |
| 12              | 1    | 100                     | 22             | -              | 9                     | 7        | 4   | 11   | A12100...                       | A12100...                    | A12100...                    | A12100...                     |
| 12              | 1,25 | 100                     | 22             | -              | 9                     | 7        | 4   | 10,8 | A12125...                       | A12125...                    | A12125...                    | A12125...                     |
| 12              | 1,5  | 100                     | 22             | -              | 9                     | 7        | 3   | 10,5 | A12150...                       | A12150...                    | A12150...                    | A12150...                     |
| 14              | 1    | 100                     | 22             | -              | 11                    | 9        | 4   | 13   | A14100...                       |                              |                              |                               |
| 14              | 1,25 | 100                     | 22             | -              | 11                    | 9        | 4   | 12,8 | A14125...                       | A14125...                    | A14125...                    | A14125...                     |
| 14              | 1,5  | 100                     | 22             | -              | 11                    | 9        | 4   | 12,5 | A14150...                       | A14150...                    | A14150...                    | A14150...                     |
| 15              | 1    | 100                     | 22             | -              | 12                    | 9        | 4   | 14   | A15100...                       |                              |                              |                               |
| 15              | 1,5  | 100                     | 22             | -              | 12                    | 9        | 4   | 13,5 | A15150...                       |                              |                              |                               |
| 16              | 1    | 100                     | 22             | -              | 12                    | 9        | 4   | 15   | A16100...                       |                              |                              |                               |
| 16              | 1,5  | 100                     | 22             | -              | 12                    | 9        | 4   | 14,5 | A16150...                       | A16150...                    | A16150...                    | A16150...                     |
| 18              | 1    | 110                     | 25             | -              | 14                    | 11       | 4   | 17   | A18100...                       |                              |                              |                               |
| 18              | 1,5  | 110                     | 25             | -              | 14                    | 11       | 4   | 16,5 | A18150...                       | A18150...                    | A18150...                    | A18150...                     |
| 20              | 1    | 125                     | 25             | -              | 16                    | 12       | 4   | 19   | A20100...                       |                              |                              |                               |

»

### MACHINE TAPS for through holes

Straight flutes with spiral point



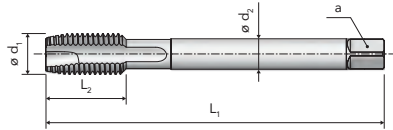
**A17 S**  
BRIGHT

**A17 S**  
VAP

**A17 S**  
TiN

**A17 S**  
TiCN

DIN 374



A SERIES

#### APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A17 S<br>BRIGHT | A17 S<br>TiN |  |  |
|-----|-------|-----------------|--------------|--|--|
| P   | P.2   | • 20-25         | • 30-35      |  |  |
|     | P.3   | • 15-20         | • 25-30      |  |  |
|     | P.4   | • 12-15         | • 20-25      |  |  |
|     | P.5   |                 | • 10-15      |  |  |
|     | P.7   |                 | • 8-10       |  |  |
| M   | M.1   |                 | • 8-10       |  |  |
| K   | K.2   | • 15-20         | • 25-30      |  |  |
| N   | N.2-3 | • 20-25         | • 30-35      |  |  |
|     | N.6   | • 15-18         | • 25-30      |  |  |

ISO2  
6H



ISO2  
6H



ISO2  
6H



ISO2  
6H



| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A17 S<br>BRIGHT<br>...0172B2AA0 | A17 S<br>VAP<br>...0172B2AB0 | A17 S<br>TiN<br>...0172B2AD0 | A17 S<br>TiCN<br>...0172B2AE0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|---------------------------------|------------------------------|------------------------------|-------------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                 |                              |                              |                               |
| M 20            | 1,5  | 125                     | 25             | -              | 16                    | 12       | 4   | 18,5 | A20150...                       |                              | A20150...                    |                               |
| 22              | 1    | 125                     | 25             | -              | 18                    | 14,5     | 4   | 21   | A22100...                       |                              |                              |                               |
| 22              | 1,5  | 125                     | 25             | -              | 18                    | 14,5     | 4   | 20,5 | A22150...                       |                              | A22150...                    |                               |
| 24              | 1    | 140                     | 25             | -              | 18                    | 14,5     | 5   | 23   | A24100...                       |                              |                              |                               |
| 24              | 1,5  | 140                     | 25             | -              | 18                    | 14,5     | 4   | 22,5 | A24150...                       |                              | A24150...                    |                               |
| 24              | 2    | 140                     | 28             | -              | 18                    | 14,5     | 4   | 22   | A24200...                       |                              |                              |                               |
| 25              | 1,5  | 140                     | 25             | -              | 18                    | 14,5     | 4   | 23,5 | A25150...                       |                              |                              |                               |
| 25              | 2    | 140                     | 28             | -              | 18                    | 14,5     | 4   | 23   | A25200...                       |                              |                              |                               |
| 26              | 1,5  | 140                     | 25             | -              | 18                    | 14,5     | 4   | 24,5 | A26150...                       |                              |                              |                               |
| 26              | 2    | 140                     | 28             | -              | 18                    | 14,5     | 4   | 24   | A26200...                       |                              |                              |                               |
| 27              | 1,5  | 140                     | 28             | -              | 20                    | 16       | 4   | 25,5 | A27150...                       |                              | A27150...                    |                               |
| 27              | 2    | 140                     | 28             | -              | 20                    | 16       | 4   | 25   | A27200...                       |                              |                              |                               |
| 28              | 1,5  | 140                     | 28             | -              | 20                    | 16       | 4   | 26,5 | A28150...                       |                              |                              |                               |
| 28              | 2    | 140                     | 28             | -              | 20                    | 16       | 4   | 26   | A28200...                       |                              |                              |                               |
| 30              | 1,5  | 150                     | 28             | -              | 22                    | 18       | 4   | 28,5 | A30150...                       |                              | A30150...                    |                               |
| 30              | 2    | 150                     | 28             | -              | 22                    | 18       | 4   | 28   | A30200...                       |                              |                              |                               |
| 32              | 1,5  | 150                     | 28             | -              | 22                    | 18       | 5   | 30,5 | A32150...                       |                              |                              |                               |
| 32              | 2    | 150                     | 28             | -              | 22                    | 18       | 4   | 30   | A32200...                       |                              |                              |                               |
| 36              | 1,5  | 170                     | 30             | -              | 28                    | 22       | 5   | 34,5 | A36150...                       |                              |                              |                               |
| 36              | 2    | 170                     | 30             | -              | 28                    | 22       | 5   | 34   | A36200...                       |                              |                              |                               |
| 36              | 3    | 200                     | 55             | -              | 28                    | 22       | 4   | 33   | A36300...                       |                              |                              |                               |
| 40              | 1,5  | 170                     | 30             | -              | 32                    | 24       | 5   | 38,5 | A40150...                       |                              |                              |                               |
| 40              | 2    | 170                     | 30             | -              | 32                    | 24       | 5   | 38   | A40200...                       |                              |                              |                               |
| 40              | 3    | 200                     | 60             | -              | 32                    | 24       | 4   | 37   | A40300...                       |                              |                              |                               |
| 42              | 1,5  | 170                     | 30             | -              | 32                    | 24       | 5   | 40,5 | A42150...                       |                              |                              |                               |
| 42              | 2    | 170                     | 30             | -              | 32                    | 24       | 5   | 40   | A42200...                       |                              |                              |                               |



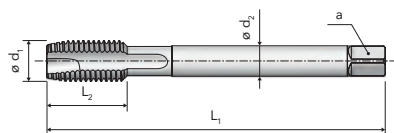
MACHINE TAPS for through holes  
Straight flutes with spiral point / for stainless steel



HSSE

**A17 S**  
TiX2

DIN 374

A  
SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A17 S<br>TIX2 |  |  |  |
|-----|-----|---------------|--|--|--|
| P   | P.7 | ● 10-12       |  |  |  |
| M   | M.1 | ● 10-12       |  |  |  |

ISO2  
6H

**B (4-5)**

2,5xD

RH

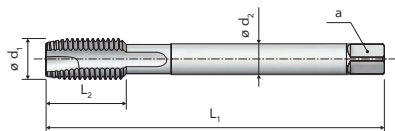
[illegible]



**A17 S 6G**  
BRIGHT

**A17 S 6G**  
TiN

DIN 374



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A17 S 6G<br>BRIGHT | A17 S 6G<br>TiN |  |  |
|-----|-------|--------------------|-----------------|--|--|
| P   | P.2   | ● 20-25            | ● 30-35         |  |  |
|     | P.3   | ● 15-20            | ● 25-30         |  |  |
|     | P.4   | ● 12-15            | ● 20-25         |  |  |
|     | P.5   |                    | ● 10-15         |  |  |
|     | P.7   |                    | ● 8-10          |  |  |
| M   | M.1   |                    | ● 8-10          |  |  |
| K   | K.2   | ● 15-20            | ● 25-30         |  |  |
| N   | N.2-3 | ● 20-25            | ● 30-35         |  |  |
|     | N.6   | ● 15-18            | ● 25-30         |  |  |

**ISO3  
6G**

ISO3  
6G



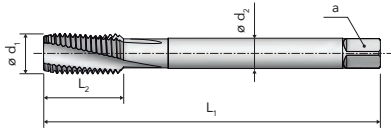
MACHINE TAPS for blind holes  
15° spiral flutes



**A30**  
BRIGHT

**A30**  
TiN

DIN 374



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A30<br>BRIGHT | A30<br>TiN |  |  |
|-----|-------|---------------|------------|--|--|
| P   | P.1   | • 18-20       | • 30-35    |  |  |
|     | P.2   | • 15-18       | • 25-30    |  |  |
|     | P.3   | • 12-15       | • 20-25    |  |  |
|     | P.4   | • 10-12       | • 15-20    |  |  |
|     | P.5   |               | • 5-10     |  |  |
| K   | K.2   | • 12-15       | • 20-25    |  |  |
| N   | N.1   | • 18-20       |            |  |  |
|     | N.2-3 | • 15-18       | • 25-30    |  |  |
|     | N.5   | • 15-18       |            |  |  |
|     | N.6   | • 12-15       | • 20-25    |  |  |

ISO2  
6H



ISO2  
6H



| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A30<br>BRIGHT<br>...0302A1AA0 | A30<br>TiN<br>...0302A1AD0 |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|-------------------------------|----------------------------|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                               |                            |  |  |
| M 3             | 0,35 | 56                      | 8              | -              | 2,2                   | -        | 3   | 2,65 | A03035...                     | A03035...                  |  |  |
| 3,5             | 0,35 | 56                      | 9              | -              | 2,5                   | 2,1      | 3   | 3,15 | A03535...                     |                            |  |  |
| 4               | 0,5  | 63                      | 12             | -              | 2,8                   | 2,1      | 3   | 3,5  | A04050...                     | A04050...                  |  |  |
| 5               | 0,5  | 70                      | 14             | -              | 3,5                   | 2,7      | 3   | 4,5  | A05050...                     | A05050...                  |  |  |
| 6               | 0,75 | 80                      | 16             | -              | 4,5                   | 3,4      | 3   | 5,2  | A06075...                     | A06075...                  |  |  |
| 7               | 0,75 | 80                      | 16             | -              | 5,5                   | 4,3      | 3   | 6,2  | A07075...                     |                            |  |  |
| 8               | 0,75 | 80                      | 16             | -              | 6                     | 4,9      | 3   | 7,2  | A08075...                     | A08075...                  |  |  |
| 8               | 1    | 90                      | 16             | -              | 6                     | 4,9      | 3   | 7    | A08100...                     | A08100...                  |  |  |
| 9               | 1    | 90                      | 16             | -              | 7                     | 5,5      | 3   | 8    | A09100...                     |                            |  |  |
| 10              | 0,75 | 90                      | 18             | -              | 7                     | 5,5      | 3   | 9,2  | A10075...                     |                            |  |  |
| 10              | 1    | 90                      | 18             | -              | 7                     | 5,5      | 3   | 9    | A10100...                     | A10100...                  |  |  |
| 10              | 1,25 | 100                     | 18             | -              | 7                     | 5,5      | 3   | 8,8  | A10125...                     | A10125...                  |  |  |
| 11              | 1    | 90                      | 20             | -              | 8                     | 6,2      | 3   | 10   | A11100...                     |                            |  |  |
| 12              | 1    | 100                     | 22             | -              | 9                     | 7        | 3   | 11   | A12100...                     | A12100...                  |  |  |
| 12              | 1,25 | 100                     | 22             | -              | 9                     | 7        | 3   | 10,8 | A12125...                     | A12125...                  |  |  |
| 12              | 1,5  | 100                     | 22             | -              | 9                     | 7        | 3   | 10,5 | A12150...                     | A12150...                  |  |  |
| 14              | 1    | 100                     | 22             | -              | 11                    | 9        | 3   | 13   | A14100...                     | A14100...                  |  |  |
| 14              | 1,25 | 100                     | 22             | -              | 11                    | 9        | 3   | 12,8 | A14125...                     | A14125...                  |  |  |
| 14              | 1,5  | 100                     | 22             | -              | 11                    | 9        | 3   | 12,5 | A14150...                     | A14150...                  |  |  |
| 15              | 1    | 100                     | 22             | -              | 12                    | 9        | 4   | 14   | A15100...                     | A15100...                  |  |  |
| 15              | 1,5  | 100                     | 22             | -              | 12                    | 9        | 3   | 13,5 | A15150...                     |                            |  |  |
| 16              | 1    | 100                     | 22             | -              | 12                    | 9        | 4   | 15   | A16100...                     | A16100...                  |  |  |
| 16              | 1,25 | 100                     | 22             | -              | 12                    | 9        | 4   | 14,8 | A16125...                     |                            |  |  |
| 16              | 1,5  | 100                     | 22             | -              | 12                    | 9        | 4   | 14,5 | A16150...                     | A16150...                  |  |  |
| 17              | 1    | 100                     | 22             | -              | 12                    | 9        | 4   | 16   | A17100...                     |                            |  |  |
| 17              | 1,5  | 100                     | 22             | -              | 12                    | 9        | 4   | 15,5 | A17150...                     |                            |  |  |

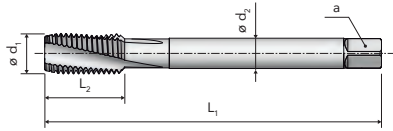


P.22

Order example for **A30 BRIGHT M3x0,35** --> A030350302A1AA0

A30  
BRIGHTA30  
TiN

DIN 374



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A30<br>BRIGHT | A30<br>TiN |  |  |
|-----|-------|---------------|------------|--|--|
| P   | P.1   | ● 18-20       | ● 30-35    |  |  |
|     | P.2   | ● 15-18       | ● 25-30    |  |  |
|     | P.3   | ● 12-15       | ● 20-25    |  |  |
|     | P.4   | ● 10-12       | ● 15-20    |  |  |
|     | P.5   |               | ● 5-10     |  |  |
| K   | K.2   | ● 12-15       | ● 20-25    |  |  |
| N   | N.1   | ● 18-20       |            |  |  |
|     | N.2-3 | ● 15-18       | ● 25-30    |  |  |
|     | N.5   | ● 15-18       |            |  |  |
|     | N.6   | ● 12-15       | ● 20-25    |  |  |

ISO2  
6HISO2  
6H

«

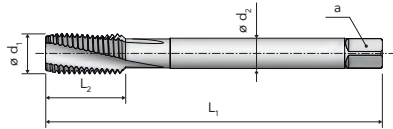
| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A30<br>BRIGHT<br>...0302A1AA0 | A30<br>TiN<br>...0302A1AD0 |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|-------------------------------|----------------------------|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                               |                            |  |  |
| <b>M 18</b>     | 1    | 110                     | 25             | -              | 14                    | 11       | 4   | 17   | A18100...                     | A18100...                  |  |  |
| <b>18</b>       | 1,5  | 110                     | 25             | -              | 14                    | 11       | 4   | 16,5 | A18150...                     | A18150...                  |  |  |
| <b>20</b>       | 1    | 125                     | 25             | -              | 16                    | 12       | 4   | 19   | A20100...                     | A20100...                  |  |  |
| <b>20</b>       | 1,5  | 125                     | 25             | -              | 16                    | 12       | 4   | 18,5 | A20150...                     | A20150...                  |  |  |
| <b>22</b>       | 1    | 125                     | 25             | -              | 18                    | 14,5     | 4   | 21   | A22100...                     |                            |  |  |
| <b>22</b>       | 1,5  | 125                     | 25             | -              | 18                    | 14,5     | 4   | 20,5 | A22150...                     | A22150...                  |  |  |
| <b>24</b>       | 1    | 140                     | 25             | -              | 18                    | 14,5     | 4   | 23   | A24100...                     |                            |  |  |
| <b>24</b>       | 1,5  | 140                     | 25             | -              | 18                    | 14,5     | 4   | 22,5 | A24150...                     | A24150...                  |  |  |
| <b>24</b>       | 2    | 140                     | 28             | -              | 18                    | 14,5     | 4   | 22   | A24200...                     |                            |  |  |
| <b>25</b>       | 1    | 140                     | 25             | -              | 18                    | 14,5     | 4   | 24   | A25100...                     |                            |  |  |
| <b>25</b>       | 1,5  | 140                     | 25             | -              | 18                    | 14,5     | 4   | 23,5 | A25150...                     |                            |  |  |
| <b>25</b>       | 2    | 140                     | 28             | -              | 18                    | 14,5     | 4   | 23   | A25200...                     |                            |  |  |
| <b>26</b>       | 1    | 140                     | 25             | -              | 18                    | 14,5     | 4   | 25   | A26100...                     |                            |  |  |
| <b>26</b>       | 1,5  | 140                     | 25             | -              | 18                    | 14,5     | 4   | 24,5 | A26150...                     |                            |  |  |
| <b>26</b>       | 2    | 140                     | 28             | -              | 18                    | 14,5     | 4   | 24   | A26200...                     |                            |  |  |
| <b>27</b>       | 1,5  | 140                     | 28             | -              | 20                    | 16       | 4   | 25,5 | A27150...                     | A27150...                  |  |  |
| <b>27</b>       | 2    | 140                     | 28             | -              | 20                    | 16       | 4   | 25   | A27200...                     |                            |  |  |
| <b>28</b>       | 1,5  | 140                     | 28             | -              | 20                    | 16       | 4   | 26,5 | A28150...                     |                            |  |  |
| <b>28</b>       | 2    | 140                     | 28             | -              | 20                    | 16       | 4   | 26   | A28200...                     |                            |  |  |
| <b>30</b>       | 1    | 150                     | 25             | -              | 22                    | 18       | 5   | 29   | A30100...                     |                            |  |  |
| <b>30</b>       | 1,5  | 150                     | 28             | -              | 22                    | 18       | 4   | 28,5 | A30150...                     | A30150...                  |  |  |
| <b>30</b>       | 2    | 150                     | 28             | -              | 22                    | 18       | 4   | 28   | A30200...                     |                            |  |  |
| <b>32</b>       | 1,5  | 150                     | 28             | -              | 22                    | 18       | 5   | 30,5 | A32150...                     |                            |  |  |
| <b>32</b>       | 2    | 150                     | 28             | -              | 22                    | 18       | 4   | 30   | A32200...                     |                            |  |  |
| <b>36</b>       | 1,5  | 170                     | 30             | -              | 28                    | 22       | 5   | 34,5 | A36150...                     |                            |  |  |
| <b>36</b>       | 2    | 170                     | 30             | -              | 28                    | 22       | 5   | 34   | A36200...                     |                            |  |  |

»



**A30**  
BRIGHT

DIN 374



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A30<br>BRIGHT |  |  |  |
|-----|-------|---------------|--|--|--|
| P   | P.1   | • 18-20       |  |  |  |
|     | P.2   | • 15-18       |  |  |  |
|     | P.3   | • 12-15       |  |  |  |
|     | P.4   | • 10-12       |  |  |  |
| K   | K.2   | • 12-15       |  |  |  |
| N   | N.1   | • 18-20       |  |  |  |
|     | N.2-3 | • 15-18       |  |  |  |
|     | N.5   | • 15-18       |  |  |  |
|     | N.6   | • 12-15       |  |  |  |

ISO2  
6H



A  
SERIES

«

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A30<br>BRIGHT<br>...0302A1AA0 |  |  |  |
|-----------------|------|------------------------|----------------|----------------|-----------------------|----------|-----|------|-------------------------------|--|--|--|
| [mm]            | [mm] | [mm]                   | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                               |  |  |  |
| <b>M 36</b>     | 3    | 200                    | 55             | -              | 28                    | 22       | 4   | 33   | A36300...                     |  |  |  |
| <b>40</b>       | 1,5  | 170                    | 30             | -              | 32                    | 24       | 5   | 38,5 | A40150...                     |  |  |  |
| <b>40</b>       | 2    | 170                    | 30             | -              | 32                    | 24       | 5   | 38   | A40200...                     |  |  |  |
| <b>40</b>       | 3    | 200                    | 60             | -              | 32                    | 24       | 5   | 37   | A40300...                     |  |  |  |
| <b>42</b>       | 1,5  | 170                    | 30             | -              | 32                    | 24       | 6   | 40,5 | A42150...                     |  |  |  |
| <b>42</b>       | 2    | 170                    | 30             | -              | 32                    | 24       | 5   | 40   | A42200...                     |  |  |  |
| <b>42</b>       | 3    | 200                    | 60             | -              | 32                    | 24       | 5   | 39   | A42300...                     |  |  |  |
| <b>45</b>       | 1,5  | 180                    | 32             | -              | 36                    | 29       | 6   | 43,5 | A45150...                     |  |  |  |
| <b>45</b>       | 2    | 180                    | 32             | -              | 36                    | 29       | 5   | 43   | A45200...                     |  |  |  |
| <b>45</b>       | 3    | 200                    | 50             | -              | 36                    | 29       | 5   | 42   | A45300...                     |  |  |  |
| <b>48</b>       | 1,5  | 190                    | 32             | -              | 36                    | 29       | 6   | 46,5 | A48150...                     |  |  |  |
| <b>48</b>       | 2    | 190                    | 32             | -              | 36                    | 29       | 6   | 46   | A48200...                     |  |  |  |
| <b>48</b>       | 3    | 225                    | 50             | -              | 36                    | 29       | 5   | 45   | A48300...                     |  |  |  |

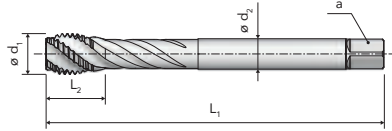

**A71 S**  
BRIGHT

**A71 S**  
VAP

**A71 S**  
TiN

**A71 S**  
TiCN

DIN 374



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A71 S<br>BRIGHT | A71 S<br>VAP | A71 S<br>TiN | A71 S<br>TiCN |
|-----|-----|-----------------|--------------|--------------|---------------|
| P   | P.2 | ● 15-20         | ● 15-20      | ● 25-30      | ● 25-30       |
|     | P.3 | ● 12-15         | ● 12-15      | ● 20-25      | ● 20-25       |
|     | P.4 | ● 10-12         | ● 10-12      | ● 15-20      | ● 15-20       |
|     | P.5 |                 |              | ● 5-10       | ● 5-10        |
| M   | M.1 |                 |              | ● 6-8        | ● 6-8         |
|     | M.2 |                 |              |              |               |
| K   | K.2 | ● 12-15         | ● 12-15      | ● 20-25      | ● 20-25       |
| N   | N.3 | ● 15-18         | ● 15-18      | ● 25-30      | ● 25-30       |
|     | N.6 | ● 15-18         | ● 15-18      | ● 25-30      | ● 25-30       |

ISO2  
6HISO2  
6HISO2  
6HISO2  
6H

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A71 S<br>BRIGHT<br>...0712B1AA0 | A71 S<br>VAP<br>...0712B1AB0 | A71 S<br>TiN<br>...0712B1AD0 | A71 S<br>TiCN<br>...0712B1AE0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|---------------------------------|------------------------------|------------------------------|-------------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                 |                              |                              |                               |
| M 3             | 0,35 | 56                      | 5              | -              | 2,2                   | -        | 3   | 2,65 | A03035...                       |                              | A03035...                    |                               |
| 4               | 0,5  | 63                      | 6              | -              | 2,8                   | 2,1      | 3   | 3,5  | A04050...                       |                              | A04050...                    |                               |
| 5               | 0,5  | 70                      | 7,5            | -              | 3,5                   | 2,7      | 3   | 4,5  | A05050...                       |                              | A05050...                    |                               |
| 6               | 0,5  | 80                      | 7,5            | -              | 4,5                   | 3,4      | 3   | 5,5  | A06050...                       |                              | A06050...                    |                               |
| 6               | 0,75 | 80                      | 7,5            | -              | 4,5                   | 3,4      | 3   | 5,2  | A06075...                       | A06075...                    | A06075...                    | A06075...                     |
| 6,5             | 0,75 | 80                      | 8              | -              | 5,5                   | 4,3      | 3   | 5,8  | A06575...                       |                              | A06575...                    |                               |
| 8               | 0,75 | 80                      | 10             | -              | 6                     | 4,9      | 3   | 7,2  | A08075...                       |                              | A08075...                    |                               |
| 8               | 1    | 90                      | 10             | -              | 6                     | 4,9      | 3   | 7    | A08100...                       | A08100...                    | A08100...                    | A08100...                     |
| 10              | 1    | 90                      | 10             | -              | 7                     | 5,5      | 3   | 9    | A10100...                       | A10100...                    | A10100...                    | A10100...                     |
| 10              | 1,25 | 100                     | 11,5           | -              | 7                     | 5,5      | 3   | 8,8  | A10125...                       | A10125...                    | A10125...                    | A10125...                     |
| 12              | 1    | 100                     | 13             | -              | 9                     | 7        | 4   | 11   | A12100...                       | A12100...                    | A12100...                    | A12100...                     |
| 12              | 1,25 | 100                     | 13,5           | -              | 9                     | 7        | 4   | 10,8 | A12125...                       | A12125...                    | A12125...                    | A12125...                     |
| 12              | 1,5  | 100                     | 14             | -              | 9                     | 7        | 4   | 10,5 | A12150...                       | A12150...                    | A12150...                    | A12150...                     |
| 14              | 1,5  | 100                     | 15,5           | -              | 11                    | 9        | 4   | 12,5 | A14150...                       | A14150...                    | A14150...                    | A14150...                     |
| 16              | 1,5  | 100                     | 15,5           | -              | 12                    | 9        | 4   | 14,5 | A16150...                       | A16150...                    | A16150...                    | A16150...                     |
| 18              | 1,5  | 110                     | 16             | -              | 14                    | 11       | 4   | 16,5 | A18150...                       | A18150...                    | A18150...                    | A18150...                     |
| 20              | 1    | 125                     | 15             | -              | 16                    | 12       | 4   | 19   | A20100...                       |                              |                              |                               |
| 20              | 1,5  | 125                     | 17             | -              | 16                    | 12       | 4   | 18,5 | A20150...                       | A20150...                    | A20150...                    | A20150...                     |
| 22              | 1,5  | 125                     | 19             | -              | 18                    | 14,5     | 4   | 20,5 | A22150...                       | A22150...                    | A22150...                    | A22150...                     |
| 24              | 1,5  | 140                     | 21             | -              | 18                    | 14,5     | 4   | 22,5 | A24150...                       |                              | A24150...                    |                               |
| 24              | 2    | 140                     | 26             | -              | 18                    | 14,5     | 4   | 22   | A24200...                       |                              |                              |                               |
| 26              | 1,5  | 140                     | 23             | -              | 18                    | 14,5     | 4   | 24,5 | A26150...                       |                              |                              |                               |
| 27              | 1,5  | 140                     | 23             | -              | 20                    | 16       | 4   | 25,5 | A27150...                       |                              | A27150...                    |                               |
| 27              | 2    | 140                     | 28             | -              | 20                    | 16       | 4   | 25   | A27200...                       |                              |                              |                               |
| 28              | 1,5  | 140                     | 23             | -              | 20                    | 16       | 4   | 26,5 | A28150...                       |                              |                              |                               |
| 30              | 1,5  | 150                     | 25             | -              | 22                    | 18       | 5   | 28,5 | A30150...                       |                              | A30150...                    |                               |

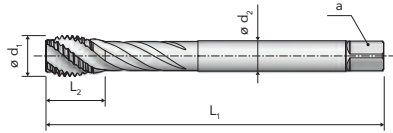
»

MACHINE TAPS for blind holes  
40° spiral flutes / back tapered



**A71 S**  
BRIGHT

DIN 374

A  
SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A71S<br>BRIGHT |  |  |  |
|-----|-----|----------------|--|--|--|
| P   | P.2 | ● 15-20        |  |  |  |
|     | P.3 | ● 12-15        |  |  |  |
|     | P.4 | ● 10-12        |  |  |  |
| K   | K.2 | ● 12-15        |  |  |  |
| N   | N.3 | ● 15-18        |  |  |  |
|     | N.6 | ● 15-18        |  |  |  |

ISO2  
6H



2,5xD



RH



&lt;&lt;

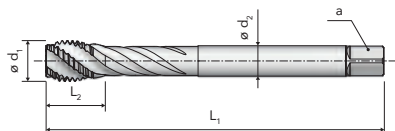
| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |  | <b>A71S</b><br>BRIGHT<br>...0712B1AA0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|---------------------------------------------------------------------------------------|---------------------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm]                                                                                  |                                       |
| <b>M 30</b>     | 2    | 150                     | 29             | -              | 22                    | 18       | 5   | 28                                                                                    | A30200...                             |
| <b>36</b>       | 3    | 200                     | 46             | -              | 28                    | 22       | 5   | 33                                                                                    | A36300...                             |
| <b>42</b>       | 3    | 200                     | 51             | -              | 32                    | 24       | 6   | 39                                                                                    | A42300...                             |



**A71S**  
TiX2

A  
SERIES

DIN 374



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A71S<br>TIX2 |  |  |  |
|-----|-----|--------------|--|--|--|
| P   | P.7 | ● 6-8        |  |  |  |
| M   | M.1 | ● 6-8        |  |  |  |

ISO2  
6H



2,5xD



RH

[illegible]

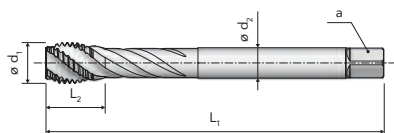
MACHINE TAPS for blind holes  
40° spiral flutes / back tapered



**A71 S 6G**  
BRIGHT

**A71 S 6G**  
TiN

DIN 374



A SERIES

APPLICATION RANGE - CUTTING SPEED m/min

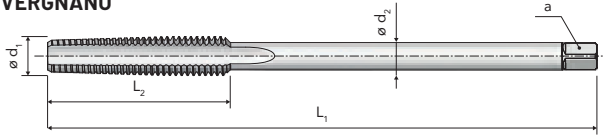
| ISO | MG  | A71 S 6G<br>BRIGHT | A71 S 6G<br>TIN |  |  |
|-----|-----|--------------------|-----------------|--|--|
| P   | P.2 | ● 15-20            | ● 25-30         |  |  |
|     | P.3 | ● 12-15            | ● 20-25         |  |  |
|     | P.4 | ● 10-12            | ● 15-20         |  |  |
|     | P.5 |                    | ● 5-10          |  |  |
|     | P.7 |                    | ● 6-8           |  |  |
| M   | M.1 |                    | ● 6-8           |  |  |
| K   | K.2 | ● 12-15            | ● 20-25         |  |  |
| N   | N.3 | ● 15-18            | ● 25-30         |  |  |
|     | N.6 | ● 15-18            | ● 25-30         |  |  |



A10  
BRIGHT

A SERIES

## NORM VERGNANO



## APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A10<br>BRIGHT |  |  |  |
|-----|-----|---------------|--|--|--|
| P   | P.1 | • 18-20       |  |  |  |
|     | P.2 | • 15-18       |  |  |  |
|     | P.3 | • 12-15       |  |  |  |

ISO2  
6H

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A10<br>BRIGHT<br>...0101A2AA0 |  |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|-------------------------------|--|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                               |  |  |  |
| <b>M 4</b>      | 0,5  | 80                      | 20             | -              | 2,8                   | 2,1      | 3   | 3,5  | A04050...                     |  |  |  |
| <b>5</b>        | 0,5  | 85                      | 22             | -              | 3,5                   | 2,7      | 3   | 4,5  | A05050...                     |  |  |  |
| <b>8</b>        | 1    | 115                     | 30             | -              | 6                     | 4,9      | 3   | 7    | A08100...                     |  |  |  |
| <b>10</b>       | 1    | 130                     | 35             | -              | 7                     | 5,5      | 3   | 9    | A10100...                     |  |  |  |
| <b>10</b>       | 1,25 | 140                     | 45             | -              | 7                     | 5,5      | 3   | 8,8  | A10125...                     |  |  |  |
| <b>12</b>       | 1,25 | 160                     | 45             | -              | 9                     | 7        | 3   | 10,8 | A12125...                     |  |  |  |
| <b>12</b>       | 1,5  | 160                     | 45             | -              | 9                     | 7        | 3   | 10,5 | A12150...                     |  |  |  |
| <b>14</b>       | 1,5  | 180                     | 45             | -              | 11                    | 9        | 3   | 12,5 | A14150...                     |  |  |  |
| <b>16</b>       | 1,5  | 190                     | 48             | -              | 12                    | 9        | 3   | 14,5 | A16150...                     |  |  |  |
| <b>18</b>       | 1,5  | 200                     | 48             | -              | 14                    | 11       | 3   | 16,5 | A18150...                     |  |  |  |
| <b>20</b>       | 1,5  | 220                     | 50             | -              | 16                    | 12       | 3   | 18,5 | A20150...                     |  |  |  |

### COLD FORMING TAPS for blind and through holes Without oil grooves

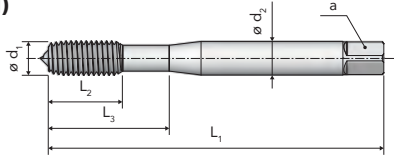


HSSE

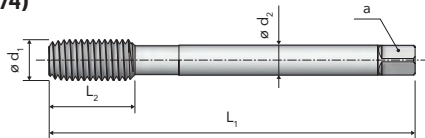
**A81**  
TiN

**A81 6GX**  
TiN

**DIN 2174 (371)**  
≤ M10x1,25



**DIN 2174 (374)**  
≥ M12x1



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A81<br>TiN | A81 6GX<br>TiN |  |  |
|-----|-------|------------|----------------|--|--|
| P   | P.1-2 | • 20-25    | • 20-25        |  |  |
|     | P.3   | • 15-20    | • 15-20        |  |  |
| N   | N.1-2 | • 20-25    | • 20-25        |  |  |
|     | N.3   | • 15-20    | • 15-20        |  |  |
|     | N.5-6 | • 20-25    | • 20-25        |  |  |

6HX

6GX



| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |       | A81<br>TiN<br>...0812A1AD0 | A81 6GX<br>TiN<br>...0812A1CD0 |  |  |
|-----------------|------|------------------------|----------------|----------------|-----------------------|----------|-----|-------|----------------------------|--------------------------------|--|--|
| [mm]            | [mm] | [mm]                   | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm]  |                            |                                |  |  |
| <b>M 3</b>      | 0,35 | 56                     | 10             | 18             | 3,5                   | 2,7      | 4   | 2,85  | A03035...                  | A03035...                      |  |  |
| <b>4</b>        | 0,5  | 63                     | 12             | 21             | 4,5                   | 3,4      | 5   | 3,8   | A04050...                  | A04050...                      |  |  |
| <b>5</b>        | 0,5  | 70                     | 14             | 24,5           | 6                     | 4,9      | 5   | 4,8   | A05050...                  | A05050...                      |  |  |
| <b>6</b>        | 0,75 | 80                     | 16             | 29             | 6                     | 4,9      | 5   | 5,65  | A06075...                  | A06075...                      |  |  |
| <b>8</b>        | 1    | 90                     | 18             | 33             | 8                     | 6,2      | 5   | 7,55  | A08100...                  | A08100...                      |  |  |
| <b>10</b>       | 1    | 90                     | 18             | 34             | 10                    | 8        | 6   | 9,55  | A10100...                  | A10100...                      |  |  |
| <b>10</b>       | 1,25 | 100                    | 20             | 36             | 10                    | 8        | 6   | 9,4   | A10125...                  | A10125...                      |  |  |
| <b>12</b>       | 1    | 100                    | 22             | -              | 9                     | 7        | 6   | 11,55 | A12100...                  | A12100...                      |  |  |
| <b>12</b>       | 1,25 | 100                    | 22             | -              | 9                     | 7        | 6   | 11,4  | A12125...                  | A12125...                      |  |  |
| <b>12</b>       | 1,5  | 100                    | 22             | -              | 9                     | 7        | 6   | 11,3  | A12150...                  | A12150...                      |  |  |
| <b>14</b>       | 1,25 | 100                    | 22             | -              | 11                    | 9        | 6   | 13,4  | A14125...                  | A14125...                      |  |  |
| <b>14</b>       | 1,5  | 100                    | 22             | -              | 11                    | 9        | 6   | 13,3  | A14150...                  | A14150...                      |  |  |
| <b>16</b>       | 1,5  | 100                    | 22             | -              | 12                    | 9        | 6   | 15,3  | A16150...                  | A16150...                      |  |  |

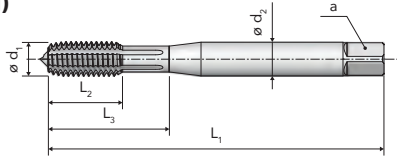
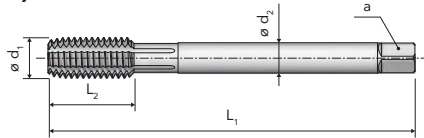
A SERIES



HSSE

A81 N  
TiNA81 N 6GX  
TiN

A SERIES

DIN 2174 (371)  
≤ M10x1,25DIN 2174 (374)  
≥ M12x1

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A81 N<br>TiN | A81 N 6GX<br>TiN |  |  |
|-----|-------|--------------|------------------|--|--|
| P   | P.1-2 | • 20-25      | • 20-25          |  |  |
|     | P.3   | • 15-20      | • 15-20          |  |  |
| N   | N.1-2 | • 20-25      | • 20-25          |  |  |
|     | N.3   | • 15-20      | • 15-20          |  |  |
|     | N.5-6 | • 20-25      | • 20-25          |  |  |

6HX

6GX



| Ød1  | P    | L1<br>js 16 | L2   | L3   | Ød2<br>h9 | a<br>h12 | z   |       | A81 N<br>TiN<br>...0812G1AD0 | A81 N 6GX<br>TiN<br>...0812G1CD0 |  |  |
|------|------|-------------|------|------|-----------|----------|-----|-------|------------------------------|----------------------------------|--|--|
| [mm] | [mm] | [mm]        | [mm] | [mm] | [mm]      | [mm]     | [-] | [mm]  |                              |                                  |  |  |
| M 3  | 0,35 | 56          | 10   | 18   | 3,5       | 2,7      | 4   | 2,85  | A03035...                    | A03035...                        |  |  |
| 4    | 0,5  | 63          | 12   | 21   | 4,5       | 3,4      | 5   | 3,8   | A04050...                    | A04050...                        |  |  |
| 5    | 0,5  | 70          | 14   | 24,5 | 6         | 4,9      | 5   | 4,8   | A05050...                    | A05050...                        |  |  |
| 6    | 0,75 | 80          | 16   | 29   | 6         | 4,9      | 5   | 5,65  | A06075...                    | A06075...                        |  |  |
| 8    | 1    | 90          | 18   | 33   | 8         | 6,2      | 5   | 7,55  | A08100...                    | A08100...                        |  |  |
| 10   | 1    | 90          | 18   | 34   | 10        | 8        | 6   | 9,55  | A10100...                    | A10100...                        |  |  |
| 10   | 1,25 | 100         | 20   | 36   | 10        | 8        | 6   | 9,4   | A10125...                    | A10125...                        |  |  |
| 12   | 1    | 100         | 22   | -    | 9         | 7        | 6   | 11,55 | A12100...                    | A12100...                        |  |  |
| 12   | 1,25 | 100         | 22   | -    | 9         | 7        | 6   | 11,4  | A12125...                    | A12125...                        |  |  |
| 12   | 1,5  | 100         | 22   | -    | 9         | 7        | 6   | 11,3  | A12150...                    | A12150...                        |  |  |
| 14   | 1,25 | 100         | 22   | -    | 11        | 9        | 6   | 13,4  | A14125...                    | A14125...                        |  |  |
| 14   | 1,5  | 100         | 22   | -    | 11        | 9        | 6   | 13,3  | A14150...                    | A14150...                        |  |  |
| 16   | 1,5  | 100         | 22   | -    | 12        | 9        | 6   | 15,3  | A16150...                    | A16150...                        |  |  |
| 18   | 1,5  | 110         | 22   | -    | 14        | 11       | 8   | 17,3  | A18150...                    | A18150...                        |  |  |
| 20   | 1,5  | 125         | 25   | -    | 16        | 12       | 8   | 19,3  | A20150...                    | A20150...                        |  |  |
|      |      |             |      |      |           |          |     |       |                              |                                  |  |  |
|      |      |             |      |      |           |          |     |       |                              |                                  |  |  |
|      |      |             |      |      |           |          |     |       |                              |                                  |  |  |
|      |      |             |      |      |           |          |     |       |                              |                                  |  |  |
|      |      |             |      |      |           |          |     |       |                              |                                  |  |  |
|      |      |             |      |      |           |          |     |       |                              |                                  |  |  |

HAND TAPS for blind and through holes  
In sets of three pieces



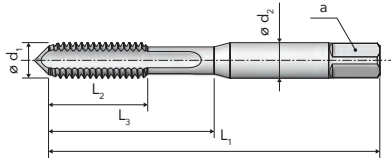
**A7**  
ROUGHING

**A7**  
SECOND

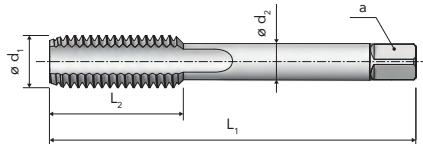
**A7**  
FINISHING

**A7**  
SET

**DIN 2184-2**  
≤ Ø 1/4"



**DIN 2184-2**  
≥ Ø 5/16"



A  
SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A7<br>ROUGHING | A7<br>SECOND | A7<br>FINISHING | A7<br>SET |
|-----|-------|----------------|--------------|-----------------|-----------|
| P   | P.1-4 | •              | •            | •               | •         |
|     | P.7   | •              | •            | •               | •         |
| K   | K.2   | •              | •            | •               | •         |
| N   | N.1-3 | •              | •            | •               | •         |
|     | N.5-7 | •              | •            | •               | •         |

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2B

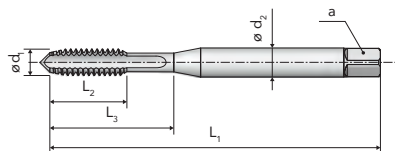
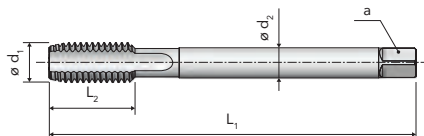
2B



| UNC    | P    | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |       | A7<br>ROUGHING<br>...0071A1MA0 | A7<br>SECOND<br>...0071A2MA0 | A7<br>FINISHING<br>...0071A3MA0 | A7<br>SET<br>...0071ASMA0 |
|--------|------|-----------------|-------------------------|----------------|----------------|-----------------------|----------|-----|-------|--------------------------------|------------------------------|---------------------------------|---------------------------|
| [TPI]  | [mm] | [mm]            | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm]  |                                |                              |                                 |                           |
| Nr.1   | 64   | 1,854           | 36                      | 7,5            | 12             | 2,8                   | 2,1      | 3   | 1,55  | AH0164...                      | AH0164...                    | AH0164...                       | AH0164...                 |
| Nr.2   | 56   | 2,184           | 36                      | 8,5            | 13,5           | 2,8                   | 2,1      | 3   | 1,85  | AH0256...                      | AH0256...                    | AH0256...                       | AH0256...                 |
| Nr.3   | 48   | 2,515           | 40                      | 8,5            | 14,5           | 2,8                   | 2,1      | 3   | 2,1   | AH0348...                      | AH0348...                    | AH0348...                       | AH0348...                 |
| Nr.4   | 40   | 2,845           | 40                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,35  | AH0440...                      | AH0440...                    | AH0440...                       | AH0440...                 |
| Nr.5   | 40   | 3,175           | 40                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,65  | AH0540...                      | AH0540...                    | AH0540...                       | AH0540...                 |
| Nr.6   | 32   | 3,505           | 45                      | 11             | 20             | 4                     | 3        | 3   | 2,85  | AH0632...                      | AH0632...                    | AH0632...                       | AH0632...                 |
| Nr.8   | 32   | 4,166           | 45                      | 12             | 21             | 4,5                   | 3,4      | 3   | 3,5   | AH0832...                      | AH0832...                    | AH0832...                       | AH0832...                 |
| Nr.10  | 24   | 4,826           | 50                      | 14             | 23             | 6                     | 4,9      | 3   | 3,9   | AH1024...                      | AH1024...                    | AH1024...                       | AH1024...                 |
| Nr.12  | 24   | 5,486           | 56                      | 16             | 28             | 6                     | 4,9      | 3   | 4,5   | AH1224...                      | AH1224...                    | AH1224...                       | AH1224...                 |
| 1/4"   | 20   | 6,35            | 56                      | 16             | 28             | 6                     | 4,9      | 3   | 5,1   | AHA140...                      | AHA140...                    | AHA140...                       | AHA140...                 |
| 5/16"  | 18   | 7,938           | 63                      | 22             | -              | 6                     | 4,9      | 3   | 6,6   | AHB516...                      | AHB516...                    | AHB516...                       | AHB516...                 |
| 3/8"   | 16   | 9,525           | 70                      | 24             | -              | 7                     | 5,5      | 3   | 8     | AHC380...                      | AHC380...                    | AHC380...                       | AHC380...                 |
| 7/16"  | 14   | 11,113          | 70                      | 24             | -              | 8                     | 6,2      | 3   | 9,4   | AHD716...                      | AHD716...                    | AHD716...                       | AHD716...                 |
| 1/2"   | 13   | 12,7            | 75                      | 28             | -              | 9                     | 7        | 3   | 10,8  | AHE120...                      | AHE120...                    | AHE120...                       | AHE120...                 |
| 9/16"  | 12   | 14,288          | 80                      | 28             | -              | 11                    | 9        | 4   | 12,2  | AHF916...                      | AHF916...                    | AHF916...                       | AHF916...                 |
| 5/8"   | 11   | 15,875          | 80                      | 30             | -              | 12                    | 9        | 4   | 13,5  | AHG580...                      | AHG580...                    | AHG580...                       | AHG580...                 |
| 3/4"   | 10   | 19,05           | 95                      | 32             | -              | 14                    | 11       | 4   | 16,5  | AHH340...                      | AHH340...                    | AHH340...                       | AHH340...                 |
| 7/8"   | 9    | 22,225          | 100                     | 32             | -              | 18                    | 14,5     | 4   | 19,5  | AHL780...                      | AHL780...                    | AHL780...                       | AHL780...                 |
| 1"     | 8    | 25,4            | 110                     | 36             | -              | 18                    | 14,5     | 4   | 22,25 | AHM100...                      | AHM100...                    | AHM100...                       | AHM100...                 |
| 1 1/8" | 7    | 28,575          | 125                     | 40             | -              | 22                    | 18       | 4   | 25    | AHN118...                      | AHN118...                    | AHN118...                       | AHN118...                 |
| 1 1/4" | 7    | 31,75           | 125                     | 40             | -              | 22                    | 18       | 4   | 28    | AHP114...                      | AHP114...                    | AHP114...                       | AHP114...                 |

A27 FC  
BRIGHTA27 FC  
TiNA27 FP  
BRIGHTA27 FP  
TiN

A SERIES

DIN 2184-1  
≤ Ø 1/4"DIN 2184-1  
≥ Ø 5/16"

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A27 FC<br>BRIGHT | A27 FC<br>TiN | A27 FP<br>BRIGHT | A27 FP<br>TiN |
|-----|-----|------------------|---------------|------------------|---------------|
| P   | P.1 |                  | ● 20-25       |                  | ● 20-25       |
|     | P.2 | ● 10-12          | ● 15-20       | ● 10-12          | ● 15-20       |
|     | P.3 | ● 8-10           | ● 12-15       | ● 8-10           | ● 12-15       |
| K   | K.2 | ● 8-10           | ● 12-15       | ● 8-10           | ● 12-15       |
| N   | N.1 |                  | ● 20-25       |                  | ● 20-25       |
|     | N.5 |                  | ● 15-20       |                  | ● 15-20       |

2B

2B

2B

2B



| UNC    | P    | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |       | A27 FC<br>BRIGHT<br>...0272A1MA0 | A27 FC<br>TiN<br>...0272A1MD0 | A27 FP<br>BRIGHT<br>...0272A2MA0 | A27 FP<br>TiN<br>...0272A2MD0 |
|--------|------|-----------------|-------------------------|----------------|----------------|-----------------------|----------|-----|-------|----------------------------------|-------------------------------|----------------------------------|-------------------------------|
| [TPI]  | [mm] | [mm]            | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm]  |                                  |                               |                                  |                               |
| Nr.2   | 56   | 2,184           | 45                      | 9              | 13             | 2,8                   | 2,1      | 3   | 1,85  | AH0256...                        | AH0256...                     | AH0256...                        | AH0256...                     |
| Nr.3   | 48   | 2,515           | 50                      | 9              | 15             | 2,8                   | 2,1      | 3   | 2,1   | AH0348...                        | AH0348...                     | AH0348...                        | AH0348...                     |
| Nr.4   | 40   | 2,845           | 56                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,35  | AH0440...                        | AH0440...                     | AH0440...                        | AH0440...                     |
| Nr.5   | 40   | 3,175           | 56                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,65  | AH0540...                        | AH0540...                     | AH0540...                        | AH0540...                     |
| Nr.6   | 32   | 3,505           | 56                      | 11             | 20             | 4                     | 3        | 3   | 2,85  | AH0632...                        | AH0632...                     | AH0632...                        | AH0632...                     |
| Nr.8   | 32   | 4,166           | 63                      | 13             | 22             | 4,5                   | 3,4      | 3   | 3,5   | AH0832...                        | AH0832...                     | AH0832...                        | AH0832...                     |
| Nr.10  | 24   | 4,826           | 70                      | 16             | 26,5           | 6                     | 4,9      | 3   | 3,9   | AH1024...                        | AH1024...                     | AH1024...                        | AH1024...                     |
| Nr.12  | 24   | 5,486           | 80                      | 16             | 26,5           | 6                     | 4,9      | 3   | 4,5   | AH1224...                        | AH1224...                     | AH1224...                        | AH1224...                     |
| 1/4"   | 20   | 6,35            | 80                      | 17             | 30             | 7                     | 5,5      | 3   | 5,1   | AHA140...                        | AHA140...                     | AHA140...                        | AHA140...                     |
| 5/16"  | 18   | 7,938           | 90                      | 18             | -              | 6                     | 4,9      | 3   | 6,6   | AHB516...                        | AHB516...                     | AHB516...                        | AHB516...                     |
| 3/8"   | 16   | 9,525           | 100                     | 22             | -              | 7                     | 5,5      | 3   | 8     | AHC380...                        | AHC380...                     | AHC380...                        | AHC380...                     |
| 7/16"  | 14   | 11,113          | 100                     | 24             | -              | 8                     | 6,2      | 3   | 9,4   | AHD716...                        | AHD716...                     | AHD716...                        | AHD716...                     |
| 1/2"   | 13   | 12,7            | 110                     | 26             | -              | 9                     | 7        | 3   | 10,8  | AHE120...                        | AHE120...                     | AHE120...                        | AHE120...                     |
| 9/16"  | 12   | 14,288          | 110                     | 28             | -              | 11                    | 9        | 3   | 12,2  | AHF916...                        | AHF916...                     | AHF916...                        | AHF916...                     |
| 5/8"   | 11   | 15,875          | 110                     | 28             | -              | 12                    | 9        | 3   | 13,5  | AHG580...                        | AHG580...                     | AHG580...                        | AHG580...                     |
| 3/4"   | 10   | 19,05           | 125                     | 32             | -              | 14                    | 11       | 4   | 16,5  | AHH340...                        | AHH340...                     | AHH340...                        | AHH340...                     |
| 7/8"   | 9    | 22,225          | 140                     | 32             | -              | 18                    | 14,5     | 4   | 19,5  | AHL780...                        | AHL780...                     | AHL780...                        | AHL780...                     |
| 1"     | 8    | 25,4            | 160                     | 36             | -              | 18                    | 14,5     | 4   | 22,25 | AHM100...                        | AHM100...                     | AHM100...                        | AHM100...                     |
| 1 1/8" | 7    | 28,575          | 180                     | 40             | -              | 22                    | 18       | 4   | 25    | AHN118...                        |                               | AHN118...                        |                               |
| 1 1/4" | 7    | 31,75           | 180                     | 40             | -              | 22                    | 18       | 4   | 28    | AHP114...                        |                               | AHP114...                        |                               |
| 1 3/8" | 6    | 34,925          | 200                     | 50             | -              | 28                    | 22       | 4   | 30,75 | AHQ138...                        |                               | AHQ138...                        |                               |
| 1 1/2" | 6    | 38,1            | 200                     | 50             | -              | 28                    | 22       | 4   | 34    | AHR112...                        |                               | AHR112...                        |                               |

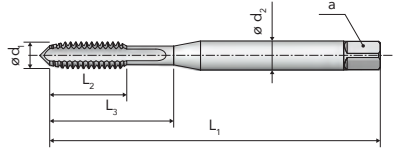


HSSE

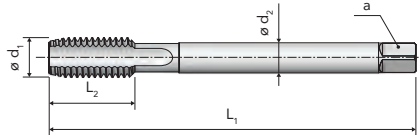
**A49**  
NITRIDED

**A49**  
TiCN

**DIN 2184-1**  
 $\leq \varnothing 1/4"$



**DIN 2184-1**  
 $\geq \varnothing 5/16"$



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG     | A49<br>NITRIDED | A49<br>TiCN |  |  |
|-----|--------|-----------------|-------------|--|--|
| K   | K.1    | ● 15-20         | ● 40-45     |  |  |
| N   | N.4    | ● 15-20         | ● 40-45     |  |  |
|     | N.7    | ● 15-20         | ● 40-45     |  |  |
|     | N.9-10 | ● 20-25         | ● 45-50     |  |  |

**2BX**

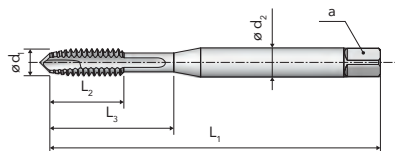
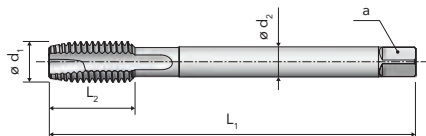
**2BX**



| UNC    | P<br>[TPI] | $\varnothing d_1$<br>[mm] | $L_1$<br>js 16<br>[mm] | $L_2$<br>[mm] | $L_3$<br>[mm] | $\varnothing d_2$<br>h9<br>[mm] | a<br>h12<br>[mm] | z |       | A49<br>NITRIDED<br>...0492A1MCO | A49<br>TiCN<br>...0492A1MEO |  |  |
|--------|------------|---------------------------|------------------------|---------------|---------------|---------------------------------|------------------|---|-------|---------------------------------|-----------------------------|--|--|
| Nr.2   | 56         | 2,184                     | 45                     | 9             | 13            | 2,8                             | 2,1              | 3 | 1,85  | AH0256...                       | AH0256...                   |  |  |
| Nr.3   | 48         | 2,515                     | 50                     | 9             | 15            | 2,8                             | 2,1              | 3 | 2,1   | AH0348...                       | AH0348...                   |  |  |
| Nr.4   | 40         | 2,845                     | 56                     | 10            | 18            | 3,5                             | 2,7              | 3 | 2,35  | AH0440...                       | AH0440...                   |  |  |
| Nr.5   | 40         | 3,175                     | 56                     | 10            | 18            | 3,5                             | 2,7              | 3 | 2,65  | AH0540...                       | AH0540...                   |  |  |
| Nr.6   | 32         | 3,505                     | 56                     | 11            | 20            | 4                               | 3                | 3 | 2,85  | AH0632...                       | AH0632...                   |  |  |
| Nr.8   | 32         | 4,166                     | 63                     | 13            | 22            | 4,5                             | 3,4              | 3 | 3,5   | AH0832...                       | AH0832...                   |  |  |
| Nr.10  | 24         | 4,826                     | 70                     | 16            | 26,5          | 6                               | 4,9              | 3 | 3,9   | AH1024...                       | AH1024...                   |  |  |
| Nr.12  | 24         | 5,486                     | 80                     | 16            | 26,5          | 6                               | 4,9              | 3 | 4,5   | AH1224...                       | AH1224...                   |  |  |
| 1/4"   | 20         | 6,35                      | 80                     | 17            | 30            | 7                               | 5,5              | 3 | 5,1   | AHA140...                       | AHA140...                   |  |  |
| 5/16"  | 18         | 7,938                     | 90                     | 18            | -             | 6                               | 4,9              | 4 | 6,6   | AHB516...                       | AHB516...                   |  |  |
| 3/8"   | 16         | 9,525                     | 100                    | 22            | -             | 7                               | 5,5              | 4 | 8     | AHC380...                       | AHC380...                   |  |  |
| 7/16"  | 14         | 11,113                    | 100                    | 24            | -             | 8                               | 6,2              | 4 | 9,4   | AHD716...                       | AHD716...                   |  |  |
| 1/2"   | 13         | 12,7                      | 110                    | 26            | -             | 9                               | 7                | 4 | 10,8  | AHE120...                       | AHE120...                   |  |  |
| 9/16"  | 12         | 14,288                    | 110                    | 28            | -             | 11                              | 9                | 4 | 12,2  | AHF916...                       | AHF916...                   |  |  |
| 5/8"   | 11         | 15,875                    | 110                    | 28            | -             | 12                              | 9                | 4 | 13,5  | AHG580...                       | AHG580...                   |  |  |
| 3/4"   | 10         | 19,05                     | 125                    | 32            | -             | 14                              | 11               | 4 | 16,5  | AHH340...                       | AHH340...                   |  |  |
| 7/8"   | 9          | 22,225                    | 140                    | 32            | -             | 18                              | 14,5             | 4 | 19,5  | AHL780...                       | AHL780...                   |  |  |
| 1"     | 8          | 25,4                      | 160                    | 36            | -             | 18                              | 14,5             | 5 | 22,25 | AHM100...                       | AHM100...                   |  |  |
| 1 1/8" | 7          | 28,575                    | 180                    | 40            | -             | 22                              | 18               | 5 | 25    | AHN118...                       |                             |  |  |
| 1 1/4" | 7          | 31,75                     | 180                    | 40            | -             | 22                              | 18               | 5 | 28    | AHP114...                       |                             |  |  |
| 1 3/8" | 6          | 34,925                    | 200                    | 50            | -             | 28                              | 22               | 5 | 30,75 | AHQ138...                       |                             |  |  |
| 1 1/2" | 6          | 38,1                      | 200                    | 50            | -             | 28                              | 22               | 5 | 34    | AHR112...                       |                             |  |  |

**A19 S**  
BRIGHT**A19 S**  
TiN**A19 S**  
TiCN**A19 S 3B**  
BRIGHT

A SERIES

**DIN 2184-1**  
≤ Ø 1/4"**DIN 2184-1**  
≥ Ø 5/16"

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A19 S<br>BRIGHT | A19 S<br>TiN | A19 S<br>TiCN | A19 S 3B<br>BRIGHT |
|-----|-------|-----------------|--------------|---------------|--------------------|
| P   | P.2   | ● 20-25         | ● 30-35      | ● 30-35       | ● 20-25            |
|     | P.3   | ● 15-20         | ● 25-30      | ● 25-30       | ● 15-20            |
|     | P.4   | ● 12-15         | ● 20-25      | ● 20-25       | ● 12-15            |
|     | P.5   |                 | ● 10-15      | ● 10-15       |                    |
| M   | M.1   |                 | ● 8-10       | ● 8-10        |                    |
|     | K.2   | ● 15-20         | ● 25-30      | ● 25-30       | ● 15-20            |
| N   | N.2-3 | ● 20-25         | ● 30-35      | ● 30-35       | ● 20-25            |
|     | N.6   | ● 15-18         | ● 25-30      | ● 25-30       | ● 15-18            |

**2B****2B****2B****3B**

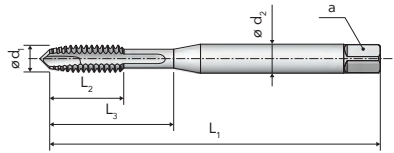
| UNC    | P  | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z |       | A19 S<br>BRIGHT<br>...0192B2MA0 | A19 S<br>TiN<br>...0192B2MD0 | A19 S<br>TiCN<br>...0192B2ME0 | A19 S 3B<br>BRIGHT<br>...0192B2NA0 |
|--------|----|-----------------|-------------------------|----------------|----------------|-----------------------|----------|---|-------|---------------------------------|------------------------------|-------------------------------|------------------------------------|
| Nr.2   | 56 | 2,184           | 45                      | 8              | 13             | 2,8                   | 2,1      | 2 | 1,85  | AH0256...                       | AH0256...                    | AH0256...                     |                                    |
| Nr.3   | 48 | 2,515           | 50                      | 9              | 15             | 2,8                   | 2,1      | 3 | 2,1   | AH0348...                       | AH0348...                    | AH0348...                     |                                    |
| Nr.4   | 40 | 2,845           | 56                      | 10             | 18             | 3,5                   | 2,7      | 3 | 2,35  | AH0440...                       | AH0440...                    | AH0440...                     |                                    |
| Nr.5   | 40 | 3,175           | 56                      | 10             | 18             | 3,5                   | 2,7      | 3 | 2,65  | AH0540...                       | AH0540...                    | AH0540...                     |                                    |
| Nr.6   | 32 | 3,505           | 56                      | 11             | 20             | 4                     | 3        | 3 | 2,85  | AH0632...                       | AH0632...                    | AH0632...                     | AH0632...                          |
| Nr.8   | 32 | 4,166           | 63                      | 13             | 22             | 4,5                   | 3,4      | 3 | 3,5   | AH0832...                       | AH0832...                    | AH0832...                     | AH0832...                          |
| Nr.10  | 24 | 4,826           | 70                      | 16             | 26,5           | 6                     | 4,9      | 3 | 3,9   | AH1024...                       | AH1024...                    | AH1024...                     | AH1024...                          |
| Nr.12  | 24 | 5,486           | 80                      | 16             | 26,5           | 6                     | 4,9      | 3 | 4,5   | AH1224...                       | AH1224...                    | AH1224...                     | AH1224...                          |
| 1/4"   | 20 | 6,35            | 80                      | 17             | 30             | 7                     | 5,5      | 3 | 5,1   | AHA140...                       | AHA140...                    | AHA140...                     | AHA140...                          |
| 5/16"  | 18 | 7,938           | 90                      | 18             | -              | 6                     | 4,9      | 3 | 6,6   | AHB516...                       | AHB516...                    | AHB516...                     | AHB516...                          |
| 3/8"   | 16 | 9,525           | 100                     | 22             | -              | 7                     | 5,5      | 3 | 8     | AHC380...                       | AHC380...                    | AHC380...                     | AHC380...                          |
| 7/16"  | 14 | 11,113          | 100                     | 24             | -              | 8                     | 6,2      | 3 | 9,4   | AHD716...                       | AHD716...                    | AHD716...                     | AHD716...                          |
| 1/2"   | 13 | 12,7            | 110                     | 26             | -              | 9                     | 7        | 3 | 10,8  | AHE120...                       | AHE120...                    | AHE120...                     | AHE120...                          |
| 9/16"  | 12 | 14,288          | 110                     | 28             | -              | 11                    | 9        | 3 | 12,2  | AHF916...                       | AHF916...                    | AHF916...                     | AHF916...                          |
| 5/8"   | 11 | 15,875          | 110                     | 28             | -              | 12                    | 9        | 3 | 13,5  | AHG580...                       | AHG580...                    | AHG580...                     | AHG580...                          |
| 3/4"   | 10 | 19,05           | 125                     | 32             | -              | 14                    | 11       | 4 | 16,5  | AHH340...                       | AHH340...                    | AHH340...                     | AHH340...                          |
| 7/8"   | 9  | 22,225          | 140                     | 32             | -              | 18                    | 14,5     | 4 | 19,5  | AHL780...                       | AHL780...                    | AHL780...                     | AHL780...                          |
| 1"     | 8  | 25,4            | 160                     | 36             | -              | 18                    | 14,5     | 4 | 22,25 | AHM100...                       | AHM100...                    | AHM100...                     |                                    |
| 1 1/4" | 7  | 31,75           | 180                     | 40             | -              | 22                    | 18       | 4 | 28    | AHP114...                       |                              |                               |                                    |
| 1 1/2" | 6  | 38,1            | 200                     | 50             | -              | 28                    | 22       | 4 | 34    | AHR112...                       |                              |                               |                                    |
|        |    |                 |                         |                |                |                       |          |   |       |                                 |                              |                               |                                    |
|        |    |                 |                         |                |                |                       |          |   |       |                                 |                              |                               |                                    |
|        |    |                 |                         |                |                |                       |          |   |       |                                 |                              |                               |                                    |



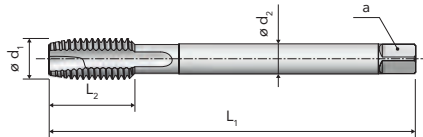
**HSSE**

**A19 S**  
TiX<sub>2</sub>

**DIN 2184-1**  
≤ Ø 1/4"



**DIN 2184-1**  
 $\geq \varnothing 5/16''$

A  
SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A19 S<br>TiX2 |  |  |  |
|-----|-----|---------------|--|--|--|
| P   | P.7 | ● 10-12       |  |  |  |
| M   | M.1 | ● 10-12       |  |  |  |

2B

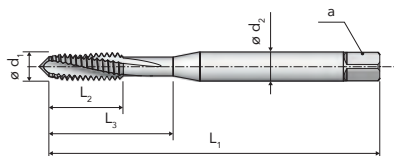
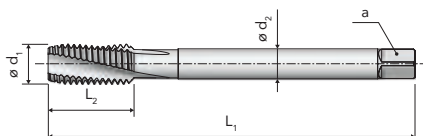
[illegible]


**A33**  
BRIGHT

**A33**  
TiN

**A33 3B**  
BRIGHT

A SERIES

**DIN 2184-1**  
≤ Ø 1/4"

**DIN 2184-1**  
≥ Ø 5/16"


APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A33<br>BRIGHT | A33<br>TiN | A33 3B<br>BRIGHT |
|-----|-------|---------------|------------|------------------|
| P   | P.1   | ● 18-20       | ● 30-35    | ● 18-20          |
|     | P.2   | ● 15-18       | ● 25-30    | ● 15-18          |
|     | P.3   | ● 12-15       | ● 20-25    | ● 12-15          |
|     | P.4   | ● 10-12       | ● 15-20    | ● 10-12          |
|     | P.5   |               | ● 5-10     |                  |
| K   | K.2   | ● 12-15       | ● 20-25    | ● 12-15          |
| N   | N.1   | ● 18-20       |            | ● 18-20          |
|     | N.2-3 | ● 15-18       | ● 25-30    | ● 15-18          |
|     | N.5   | ● 15-18       |            | ● 15-18          |
|     | N.6   | ● 12-15       | ● 20-25    | ● 12-15          |

2B

2B

3B



| UNC    | P    | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |       | A33<br>BRIGHT<br>...0332A1MA0 | A33<br>TiN<br>...0332A1MD0 | A33 3B<br>BRIGHT<br>...0332A1NA0 |
|--------|------|-----------------|-------------------------|----------------|----------------|-----------------------|----------|-----|-------|-------------------------------|----------------------------|----------------------------------|
| [TPI]  | [mm] | [mm]            | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm]  |                               |                            |                                  |
| Nr.2   | 56   | 2,184           | 45                      | 8              | 13             | 2,8                   | 2,1      | 3   | 1,85  | AH0256...                     | AH0256...                  |                                  |
| Nr.3   | 48   | 2,515           | 50                      | 9              | 15             | 2,8                   | 2,1      | 3   | 2,1   | AH0348...                     | AH0348...                  |                                  |
| Nr.4   | 40   | 2,845           | 56                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,35  | AH0440...                     | AH0440...                  |                                  |
| Nr.5   | 40   | 3,175           | 56                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,65  | AH0540...                     | AH0540...                  |                                  |
| Nr.6   | 32   | 3,505           | 56                      | 11             | 20             | 4                     | 3        | 3   | 2,85  | AH0632...                     | AH0632...                  | AH0632...                        |
| Nr.8   | 32   | 4,166           | 63                      | 13             | 20             | 4,5                   | 3,4      | 3   | 3,5   | AH0832...                     | AH0832...                  | AH0832...                        |
| Nr.10  | 24   | 4,826           | 70                      | 16             | 26,5           | 6                     | 4,9      | 3   | 3,9   | AH1024...                     | AH1024...                  | AH1024...                        |
| Nr.12  | 24   | 5,486           | 80                      | 16             | 29             | 6                     | 4,9      | 3   | 4,5   | AH1224...                     | AH1224...                  | AH1224...                        |
| 1/4"   | 20   | 6,35            | 80                      | 17             | 30             | 7                     | 5,5      | 3   | 5,1   | AHA140...                     | AHA140...                  | AHA140...                        |
| 5/16"  | 18   | 7,938           | 90                      | 18             | -              | 6                     | 4,9      | 3   | 6,6   | AHB516...                     | AHB516...                  | AHB516...                        |
| 3/8"   | 16   | 9,525           | 100                     | 22             | -              | 7                     | 5,5      | 3   | 8     | AHC380...                     | AHC380...                  | AHC380...                        |
| 7/16"  | 14   | 11,113          | 100                     | 24             | -              | 8                     | 6,2      | 3   | 9,4   | AHD716...                     | AHD716...                  | AHD716...                        |
| 1/2"   | 13   | 12,7            | 110                     | 26             | -              | 9                     | 7        | 3   | 10,8  | AHE120...                     | AHE120...                  | AHE120...                        |
| 9/16"  | 12   | 14,288          | 110                     | 28             | -              | 11                    | 9        | 3   | 12,2  | AHF916...                     | AHF916...                  | AHF916...                        |
| 5/8"   | 11   | 15,875          | 110                     | 28             | -              | 12                    | 9        | 3   | 13,5  | AHG580...                     | AHG580...                  | AHG580...                        |
| 3/4"   | 10   | 19,05           | 125                     | 32             | -              | 14                    | 11       | 4   | 16,5  | AHH340...                     | AHH340...                  | AHH340...                        |
| 7/8"   | 9    | 22,225          | 140                     | 32             | -              | 18                    | 14,5     | 4   | 19,5  | AHL780...                     | AHL780...                  |                                  |
| 1"     | 8    | 25,4            | 160                     | 36             | -              | 18                    | 14,5     | 4   | 22,25 | AHM100...                     | AHM100...                  |                                  |
| 1 1/8" | 7    | 28,575          | 180                     | 40             | -              | 22                    | 18       | 4   | 25    | AHN118...                     |                            |                                  |
| 1 1/4" | 7    | 31,75           | 180                     | 40             | -              | 22                    | 18       | 4   | 28    | AHP114...                     |                            |                                  |
| 1 3/8" | 6    | 34,925          | 200                     | 50             | -              | 28                    | 22       | 4   | 30,75 | AHQ138...                     |                            |                                  |
| 1 1/2" | 6    | 38,1            | 200                     | 50             | -              | 28                    | 22       | 4   | 34    | AHR112...                     |                            |                                  |

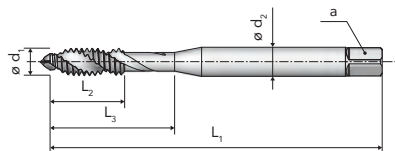




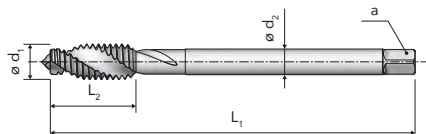
**A65**  
BRIGHT

A  
SERIES

**DIN 2184-1**  
≤ Ø 1/4"



**DIN 2184-1**  
 $\geq \varnothing 5/16''$



APPLICATION RANGE - CUTTING SPEED m/min

2B



| ISO | MG    | A65<br>BRIGHT |  |  |  |
|-----|-------|---------------|--|--|--|
| N   | N.1-2 | ● 12-15       |  |  |  |
|     | N.5-6 | ● 10-12       |  |  |  |
| S   | S.1   | ● 6-8         |  |  |  |
|     | S.3   | ● 6-8         |  |  |  |

[illegible]

HAND TAPS for blind and through holes  
In sets of two pieces



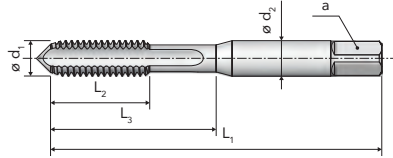
HSS

**A8**  
ROUGHING

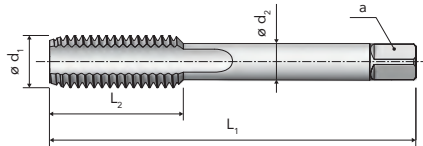
**A8**  
FINISHING

**A8**  
SET

DIN 2184-2  
≤ Ø 1/4"



DIN 2184-2  
≥ Ø 5/16"



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A8<br>ROUGHING | A8<br>FINISHING | A8<br>SET |
|-----|-------|----------------|-----------------|-----------|
| P   | P.1-4 | •              | •               | •         |
|     | P.7   | •              | •               | •         |
| K   | K.2   | •              | •               | •         |
| N   | N.1-3 | •              | •               | •         |
|     | N.5-7 | •              | •               | •         |



2B



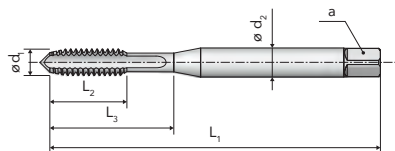
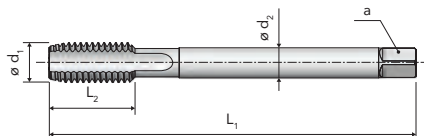
2B



| UNF    | P     | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   | z     | z    | A8<br>ROUGHING<br>...0081A1MA0 | A8<br>FINISHING<br>...0081A3MA0 | A8<br>SET<br>...0081ASMA0 |
|--------|-------|-----------------|-------------------------|----------------|----------------|-----------------------|----------|-----|-------|------|--------------------------------|---------------------------------|---------------------------|
|        | [TPI] | [mm]            | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm]  | [mm] |                                |                                 |                           |
| Nr.2   | 64    | 2,184           | 36                      | 9              | 15             | 2,8                   | 2,1      | 3   | 1,85  |      | AN0264...                      | AN0264...                       | AN0264...                 |
| Nr.3   | 56    | 2,515           | 40                      | 9              | 15             | 2,8                   | 2,1      | 3   | 2,15  |      | AN0356...                      | AN0356...                       | AN0356...                 |
| Nr.4   | 48    | 2,845           | 40                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,4   |      | AN0448...                      | AN0448...                       | AN0448...                 |
| Nr.5   | 44    | 3,175           | 40                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,7   |      | AN0544...                      | AN0544...                       | AN0544...                 |
| Nr.6   | 40    | 3,505           | 45                      | 11             | 20             | 4                     | 3        | 3   | 2,95  |      | AN0640...                      | AN0640...                       | AN0640...                 |
| Nr.8   | 36    | 4,166           | 45                      | 12             | 21             | 4,5                   | 3,4      | 3   | 3,5   |      | AN0836...                      | AN0836...                       | AN0836...                 |
| Nr.10  | 32    | 4,826           | 50                      | 14             | 23             | 6                     | 4,9      | 3   | 4,1   |      | AN1032...                      | AN1032...                       | AN1032...                 |
| Nr.12  | 28    | 5,486           | 56                      | 16             | 28             | 6                     | 4,9      | 3   | 4,6   |      | AN1228...                      | AN1228...                       | AN1228...                 |
| 1/4"   | 28    | 6,35            | 56                      | 16             | 28             | 6                     | 4,9      | 3   | 5,5   |      | ANA140...                      | ANA140...                       | ANA140...                 |
| 5/16"  | 24    | 7,938           | 63                      | 18             | -              | 6                     | 4,9      | 3   | 6,9   |      | ANB516...                      | ANB516...                       | ANB516...                 |
| 3/8"   | 24    | 9,525           | 63                      | 18             | -              | 7                     | 5,5      | 3   | 8,5   |      | ANC380...                      | ANC380...                       | ANC380...                 |
| 7/16"  | 20    | 11,113          | 70                      | 20             | -              | 8                     | 6,2      | 3   | 9,9   |      | AND716...                      | AND716...                       | AND716...                 |
| 1/2"   | 20    | 12,7            | 70                      | 20             | -              | 9                     | 7        | 4   | 11,5  |      | ANE120...                      | ANE120...                       | ANE120...                 |
| 9/16"  | 18    | 14,288          | 70                      | 22             | -              | 11                    | 9        | 4   | 12,9  |      | ANF916...                      | ANF916...                       | ANF916...                 |
| 5/8"   | 18    | 15,875          | 70                      | 22             | -              | 12                    | 9        | 4   | 14,5  |      | ANG580...                      | ANG580...                       | ANG580...                 |
| 3/4"   | 16    | 19,05           | 80                      | 22             | -              | 14                    | 11       | 4   | 17,5  |      | ANH340...                      | ANH340...                       | ANH340...                 |
| 7/8"   | 14    | 22,225          | 80                      | 22             | -              | 18                    | 14,5     | 4   | 20,4  |      | ANL780...                      | ANL780...                       | ANL780...                 |
| 1"     | 12    | 25,4            | 90                      | 22             | -              | 18                    | 14,5     | 4   | 23,25 |      | ANM100...                      | ANM100...                       | ANM100...                 |
| 1 1/8" | 12    | 28,575          | 90                      | 22             | -              | 22                    | 18       | 4   | 26,5  |      | ANN118...                      | ANN118...                       | ANN118...                 |
| 1 1/4" | 12    | 31,75           | 90                      | 22             | -              | 22                    | 18       | 4   | 29,5  |      | ANP114...                      | ANP114...                       | ANP114...                 |
|        |       |                 |                         |                |                |                       |          |     |       |      |                                |                                 |                           |
|        |       |                 |                         |                |                |                       |          |     |       |      |                                |                                 |                           |
|        |       |                 |                         |                |                |                       |          |     |       |      |                                |                                 |                           |

A28 FC  
BRIGHTA28 FC  
TiNA28 FP  
BRIGHTA28 FP  
TiN

A SERIES

DIN 2184-1  
≤ Ø 1/4"DIN 2184-1  
≥ Ø 5/16"

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A28 FC<br>BRIGHT | A28 FC<br>TiN | A28 FP<br>BRIGHT | A28 FP<br>TiN |
|-----|-----|------------------|---------------|------------------|---------------|
| P   | P.1 |                  | ● 20-25       |                  | ● 20-25       |
|     | P.2 | ● 10-12          | ● 15-20       | ● 10-12          | ● 15-20       |
|     | P.3 | ● 8-10           | ● 12-15       | ● 8-10           | ● 12-15       |
| K   | K.2 | ● 8-10           | ● 12-15       | ● 8-10           | ● 12-15       |
| N   | N.1 |                  | ● 20-25       |                  | ● 20-25       |
|     | N.5 |                  | ● 15-20       |                  | ● 15-20       |

2B

2B

2B

2B



| UNF    | P<br>[TPI] | Ød <sub>1</sub><br>[mm] | L <sub>1</sub><br>js 16<br>[mm] | L <sub>2</sub><br>[mm] | L <sub>3</sub><br>[mm] | Ød <sub>2</sub><br>h9<br>[mm] | a<br>h12<br>[mm] | z |       | A28 FC<br>BRIGHT<br>...0282A1MA0 | A28 FC<br>TiN<br>...0282A1MD0 | A28 FP<br>BRIGHT<br>...0282A2MA0 | A28 FP<br>TiN<br>...0282A2MD0 |
|--------|------------|-------------------------|---------------------------------|------------------------|------------------------|-------------------------------|------------------|---|-------|----------------------------------|-------------------------------|----------------------------------|-------------------------------|
| Nr.2   | 64         | 2,184                   | 45                              | 9                      | 13                     | 2,8                           | 2,1              | 3 | 1,85  | AN0264...                        | AN0264...                     | AN0264...                        | AN0264...                     |
| Nr.3   | 56         | 2,515                   | 50                              | 9                      | 15                     | 2,8                           | 2,1              | 3 | 2,15  | AN0356...                        | AN0356...                     | AN0356...                        | AN0356...                     |
| Nr.4   | 48         | 2,845                   | 56                              | 10                     | 18                     | 3,5                           | 2,7              | 3 | 2,4   | AN0448...                        | AN0448...                     | AN0448...                        | AN0448...                     |
| Nr.5   | 44         | 3,175                   | 56                              | 10                     | 18                     | 3,5                           | 2,7              | 3 | 2,7   | AN0544...                        | AN0544...                     | AN0544...                        | AN0544...                     |
| Nr.6   | 40         | 3,505                   | 56                              | 11                     | 20                     | 4                             | 3                | 3 | 2,95  | AN0640...                        | AN0640...                     | AN0640...                        | AN0640...                     |
| Nr.8   | 36         | 4,166                   | 63                              | 12                     | 21                     | 4,5                           | 3,4              | 3 | 3,5   | AN0836...                        | AN0836...                     | AN0836...                        | AN0836...                     |
| Nr.10  | 32         | 4,826                   | 70                              | 14                     | 24,5                   | 6                             | 4,9              | 3 | 4,1   | AN1032...                        | AN1032...                     | AN1032...                        | AN1032...                     |
| Nr.12  | 28         | 5,486                   | 80                              | 16                     | 26,5                   | 6                             | 4,9              | 3 | 4,6   | AN1228...                        | AN1228...                     | AN1228...                        | AN1228...                     |
| 1/4"   | 28         | 6,35                    | 80                              | 16                     | 30                     | 7                             | 5,5              | 3 | 5,5   | ANA140...                        | ANA40...                      | ANA140...                        | ANA140...                     |
| 5/16"  | 24         | 7,938                   | 90                              | 18                     | -                      | 6                             | 4,9              | 3 | 6,9   | ANB516...                        | ANB516...                     | ANB516...                        | ANB516...                     |
| 3/8"   | 24         | 9,525                   | 90                              | 18                     | -                      | 7                             | 5,5              | 3 | 8,5   | ANC380...                        | ANC380...                     | ANC380...                        | ANC380...                     |
| 7/16"  | 20         | 11,113                  | 100                             | 20                     | -                      | 8                             | 6,2              | 3 | 9,9   | AND716...                        | AND716...                     | AND716...                        | AND716...                     |
| 1/2"   | 20         | 12,7                    | 100                             | 22                     | -                      | 9                             | 7                | 3 | 11,5  | ANE120...                        | ANE120...                     | ANE120...                        | ANE120...                     |
| 9/16"  | 18         | 14,288                  | 100                             | 22                     | -                      | 11                            | 9                | 3 | 12,9  | ANF916...                        | ANF916...                     | ANF916...                        | ANF916...                     |
| 5/8"   | 18         | 15,875                  | 100                             | 22                     | -                      | 12                            | 9                | 3 | 14,5  | ANG580...                        | ANG580...                     | ANG580...                        | ANG580...                     |
| 3/4"   | 16         | 19,05                   | 110                             | 25                     | -                      | 14                            | 11               | 4 | 17,5  | ANH340...                        | ANH340...                     | ANH340...                        | ANH340...                     |
| 7/8"   | 14         | 22,225                  | 125                             | 25                     | -                      | 18                            | 14,5             | 4 | 20,4  | ANL780...                        | ANL780...                     | ANL780...                        | ANL780...                     |
| 1"     | 12         | 25,4                    | 140                             | 28                     | -                      | 18                            | 14,5             | 4 | 23,25 | ANM100...                        | ANM100...                     | ANM100...                        | ANM100...                     |
| 1 1/8" | 12         | 28,575                  | 150                             | 28                     | -                      | 22                            | 18               | 4 | 26,5  | ANN118...                        |                               | ANN118...                        |                               |
| 1 1/4" | 12         | 31,75                   | 150                             | 28                     | -                      | 22                            | 18               | 4 | 29,5  | ANP114...                        |                               | ANP114...                        |                               |
| 1 3/8" | 12         | 34,925                  | 170                             | 30                     | -                      | 28                            | 22               | 5 | 32,75 | ANQ138...                        |                               | ANQ138...                        |                               |
| 1 1/2" | 12         | 38,1                    | 170                             | 30                     | -                      | 28                            | 22               | 5 | 36    | ANR112...                        |                               | ANR112...                        |                               |

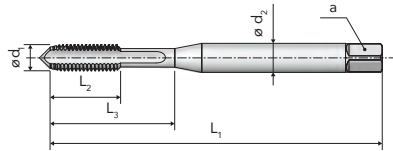


HSSE

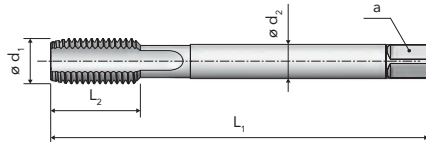
**A50**  
NITRIDED

**A50**  
TiCN

**DIN 2184-1**  
≤ Ø 1/4"



**DIN 2184-1**  
≥ Ø 5/16"



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG     | A50<br>NITRIDED | A50<br>TiCN |  |  |
|-----|--------|-----------------|-------------|--|--|
| K   | K.1    | ● 15-20         | ● 40-45     |  |  |
| N   | N.4    | ● 15-20         | ● 40-45     |  |  |
|     | N.7    | ● 15-20         | ● 40-45     |  |  |
|     | N.9-10 | ● 20-25         | ● 45-50     |  |  |

**2BX**

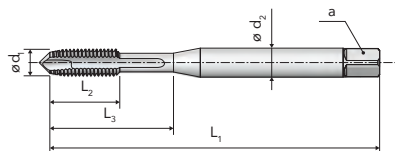
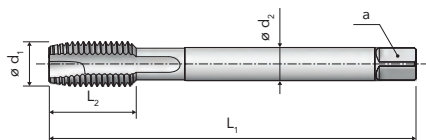
**2BX**



| UNF    | P  | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z |       | A50<br>NITRIDED<br>...0502A1MCO | A50<br>TiCN<br>...0502A1MEO |  |  |
|--------|----|-----------------|-------------------------|----------------|----------------|-----------------------|----------|---|-------|---------------------------------|-----------------------------|--|--|
| Nr.8   | 36 | 4,166           | 63                      | 12             | 21             | 4,5                   | 3,4      | 3 | 3,5   | AN0836...                       | AN0836...                   |  |  |
| Nr.10  | 32 | 4,826           | 70                      | 14             | 24,5           | 6                     | 4,9      | 3 | 4,1   | AN1032...                       | AN1032...                   |  |  |
| Nr.12  | 28 | 5,486           | 80                      | 16             | 26,5           | 6                     | 4,9      | 3 | 4,6   | AN1228...                       | AN1228...                   |  |  |
| 1/4"   | 28 | 6,35            | 80                      | 16             | 30             | 7                     | 5,5      | 3 | 5,5   | ANA140...                       | ANA140...                   |  |  |
| 5/16"  | 24 | 7,938           | 90                      | 18             | -              | 6                     | 4,9      | 4 | 6,9   | ANB516...                       | ANB516...                   |  |  |
| 3/8"   | 24 | 9,525           | 90                      | 18             | -              | 7                     | 5,5      | 4 | 8,5   | ANC380...                       | ANC380...                   |  |  |
| 7/16"  | 20 | 11,113          | 100                     | 20             | -              | 8                     | 6,2      | 4 | 9,9   | AND716...                       | AND716...                   |  |  |
| 1/2"   | 20 | 12,7            | 100                     | 22             | -              | 9                     | 7        | 4 | 11,5  | ANE120...                       | ANE120...                   |  |  |
| 9/16"  | 18 | 14,288          | 100                     | 22             | -              | 11                    | 9        | 4 | 12,9  | ANF916...                       | ANF916...                   |  |  |
| 5/8"   | 18 | 15,875          | 100                     | 22             | -              | 12                    | 9        | 4 | 14,5  | ANG580...                       | ANG580...                   |  |  |
| 3/4"   | 16 | 19,05           | 110                     | 25             | -              | 14                    | 11       | 4 | 17,5  | ANH340...                       | ANH340...                   |  |  |
| 7/8"   | 14 | 22,225          | 125                     | 25             | -              | 18                    | 14,5     | 4 | 20,4  | ANL780...                       | ANL780...                   |  |  |
| 1"     | 12 | 25,4            | 140                     | 28             | -              | 18                    | 14,5     | 5 | 23,25 | ANM100...                       | ANM100...                   |  |  |
| 1 1/8" | 12 | 28,575          | 150                     | 28             | -              | 22                    | 18       | 5 | 26,5  | ANN118...                       |                             |  |  |
| 1 1/4" | 12 | 31,75           | 150                     | 28             | -              | 22                    | 18       | 5 | 29,5  | ANP114...                       |                             |  |  |
| 1 3/8" | 12 | 34,925          | 170                     | 30             | -              | 28                    | 22       | 5 | 32,75 | ANQ138...                       |                             |  |  |
| 1 1/2" | 12 | 38,1            | 170                     | 30             | -              | 28                    | 22       | 5 | 36    | ANR112...                       |                             |  |  |
|        |    |                 |                         |                |                |                       |          |   |       |                                 |                             |  |  |
|        |    |                 |                         |                |                |                       |          |   |       |                                 |                             |  |  |
|        |    |                 |                         |                |                |                       |          |   |       |                                 |                             |  |  |
|        |    |                 |                         |                |                |                       |          |   |       |                                 |                             |  |  |
|        |    |                 |                         |                |                |                       |          |   |       |                                 |                             |  |  |

**A20 S**  
BRIGHT**A20 S**  
TiN**A20 S**  
TiCN**A20 S 3B**  
BRIGHT

A SERIES

**DIN 2184-1**  
≤ Ø 1/4"**DIN 2184-1**  
≥ Ø 5/16"

## APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A20 S<br>BRIGHT | A20 S<br>TiN | A20 S<br>TiCN | A20 S 3B<br>BRIGHT |
|-----|-------|-----------------|--------------|---------------|--------------------|
| P   | P.2   | ● 20-25         | ● 30-35      | ● 30-35       | ● 20-25            |
|     | P.3   | ● 15-20         | ● 25-30      | ● 25-30       | ● 15-20            |
|     | P.4   | ● 12-15         | ● 20-25      | ● 20-25       | ● 12-15            |
|     | P.5   |                 | ● 10-15      | ● 10-15       |                    |
| M   | M.1   |                 | ● 8-10       | ● 8-10        |                    |
|     | M.2   |                 | ● 8-10       | ● 8-10        |                    |
| K   | K.2   | ● 15-20         | ● 25-30      | ● 25-30       | ● 15-20            |
| N   | N.2-3 | ● 20-25         | ● 30-35      | ● 30-35       | ● 20-25            |
|     | N.6   | ● 15-18         | ● 25-30      | ● 25-30       | ● 15-18            |

2B

2B

2B

3B



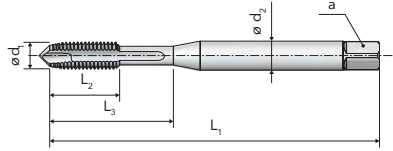
| UNF    | P  | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z |       | A20 S<br>BRIGHT<br>...0202B2MA0 | A20 S<br>TiN<br>...0202B2MD0 | A20 S<br>TiCN<br>...0202B2ME0 | A20 S 3B<br>BRIGHT<br>...0202B2NA0 |
|--------|----|-----------------|-------------------------|----------------|----------------|-----------------------|----------|---|-------|---------------------------------|------------------------------|-------------------------------|------------------------------------|
| Nr.2   | 64 | 2,184           | 45                      | 8              | 13             | 2,8                   | 2,1      | 2 | 1,85  | AN0264...                       | AN0264...                    | AN0264...                     |                                    |
| Nr.3   | 56 | 2,515           | 50                      | 9              | 15             | 2,8                   | 2,1      | 3 | 2,15  | AN0356...                       | AN0356...                    | AN0356...                     |                                    |
| Nr.4   | 48 | 2,845           | 56                      | 10             | 18             | 3,5                   | 2,7      | 3 | 2,4   | AN0448...                       | AN0448...                    | AN0448...                     |                                    |
| Nr.5   | 44 | 3,175           | 56                      | 10             | 18             | 3,5                   | 2,7      | 3 | 2,7   | AN0544...                       | AN0544...                    | AN0544...                     |                                    |
| Nr.6   | 40 | 3,505           | 56                      | 11             | 20             | 4                     | 3        | 3 | 2,95  | AN0640...                       | AN0640...                    | AN0640...                     | AN0640...                          |
| Nr.8   | 36 | 4,166           | 63                      | 12             | 21             | 4,5                   | 3,4      | 3 | 3,5   | AN0836...                       | AN0836...                    | AN0836...                     | AN0836...                          |
| Nr.10  | 32 | 4,826           | 70                      | 14             | 24,5           | 6                     | 4,9      | 3 | 4,1   | AN1032...                       | AN1032...                    | AN1032...                     | AN1032...                          |
| Nr.12  | 28 | 5,486           | 80                      | 16             | 26,5           | 6                     | 4,9      | 3 | 4,6   | AN1228...                       | AN1228...                    | AN1228...                     | AN1228...                          |
| 1/4"   | 28 | 6,35            | 80                      | 16             | 30             | 7                     | 5,5      | 3 | 5,5   | ANA140...                       | ANA140...                    | ANA140...                     | ANA140...                          |
| 5/16"  | 24 | 7,938           | 90                      | 18             | -              | 6                     | 4,9      | 3 | 6,9   | ANB516...                       | ANB516...                    | ANB516...                     | ANB516...                          |
| 3/8"   | 24 | 9,525           | 90                      | 18             | -              | 7                     | 5,5      | 3 | 8,5   | ANC380...                       | ANC380...                    | ANC380...                     | ANC380...                          |
| 7/16"  | 20 | 11,113          | 100                     | 20             | -              | 8                     | 6,2      | 3 | 9,9   | AND716...                       | AND716...                    | AND716...                     | AND716...                          |
| 1/2"   | 20 | 12,7            | 100                     | 22             | -              | 9                     | 7        | 4 | 11,5  | ANE120...                       | ANE120...                    | ANE120...                     | ANE120...                          |
| 9/16"  | 18 | 14,288          | 100                     | 22             | -              | 11                    | 9        | 4 | 12,9  | ANF916...                       | ANF916...                    | ANF916...                     | ANF916...                          |
| 5/8"   | 18 | 15,875          | 100                     | 22             | -              | 12                    | 9        | 4 | 14,5  | ANG580...                       | ANG580...                    | ANG580...                     | ANG580...                          |
| 3/4"   | 16 | 19,05           | 110                     | 25             | -              | 14                    | 11       | 4 | 17,5  | ANH340...                       | ANH340...                    | ANH340...                     | ANH340...                          |
| 7/8"   | 14 | 22,225          | 125                     | 25             | -              | 18                    | 14,5     | 4 | 20,4  | ANL780...                       | ANL780...                    | ANL780...                     | ANL780...                          |
| 1"     | 12 | 25,4            | 140                     | 28             | -              | 18                    | 14,5     | 4 | 23,25 | ANM100...                       | ANM100...                    | ANM100...                     | ANM100...                          |
| 1 1/4" | 12 | 31,75           | 150                     | 28             | -              | 22                    | 18       | 4 | 29,5  | ANP114...                       |                              |                               |                                    |
| 1 1/2" | 12 | 38,1            | 170                     | 30             | -              | 28                    | 22       | 5 | 36    | ANR112...                       |                              |                               |                                    |
|        |    |                 |                         |                |                |                       |          |   |       |                                 |                              |                               |                                    |
|        |    |                 |                         |                |                |                       |          |   |       |                                 |                              |                               |                                    |
|        |    |                 |                         |                |                |                       |          |   |       |                                 |                              |                               |                                    |



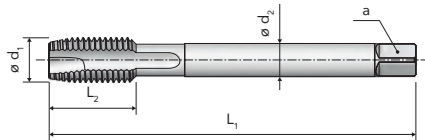
HSSE

**A20 S**  
TiX2

**DIN 2184-1**  
≤ Ø 1/4"



**DIN 2184-1**  
 $\geq \varnothing 5/16''$



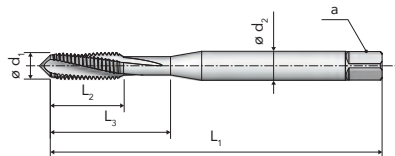
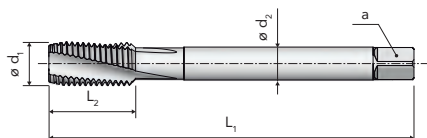
A SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A20 S<br>TiX2 |  |  |  |
|-----|-----|---------------|--|--|--|
| P   | P.7 | ● 10-15       |  |  |  |
| M   | M.1 | ● 10-15       |  |  |  |

2B

[illegible]

A34  
BRIGHTA34  
TiNA34 3B  
BRIGHTDIN 2184-1  
≤ Ø 1/4"DIN 2184-1  
≥ Ø 5/16"

## APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A34<br>BRIGHT | A34<br>TiN | A34 3B<br>BRIGHT |
|-----|-------|---------------|------------|------------------|
| P   | P.1   | ● 18-20       | ● 30-35    | ● 18-20          |
|     | P.2   | ● 15-18       | ● 25-30    | ● 15-18          |
|     | P.3   | ● 12-15       | ● 20-25    | ● 12-15          |
|     | P.4   | ● 10-12       | ● 15-20    | ● 10-12          |
|     | P.5   |               | ● 5-10     |                  |
| K   | K.2   | ● 12-15       | ● 20-25    | ● 12-15          |
| N   | N.1   | ● 18-20       |            | ● 18-20          |
|     | N.2-3 | ● 15-18       | ● 25-30    | ● 15-18          |
|     | N.5   | ● 15-18       |            | ● 15-18          |
|     | N.6   | ● 12-15       | ● 20-25    | ● 12-15          |

2B

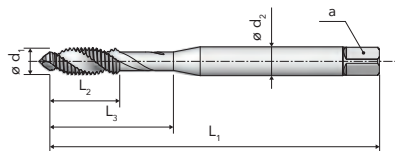
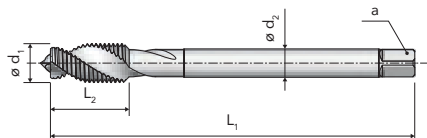
2B

3B



| UNF    | P     | Ød <sub>1</sub> | L <sub>1</sub> | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub> | a    | z   |       | A34<br>BRIGHT | A34<br>TiN   | A34 3B<br>BRIGHT |
|--------|-------|-----------------|----------------|----------------|----------------|-----------------|------|-----|-------|---------------|--------------|------------------|
|        | [TPI] | [mm]            | [mm]           | [mm]           | [mm]           | [mm]            | [mm] | [-] | [mm]  | ...0342A1MA0  | ...0342A1MD0 | ...0342A1NA0     |
| Nr.2   | 64    | 2,184           | 45             | 8              | 13             | 2,8             | 2,1  | 3   | 1,85  | AN0264...     | AN0264...    |                  |
| Nr.3   | 56    | 2,515           | 50             | 9              | 15             | 2,8             | 2,1  | 3   | 2,15  | AN0356...     | AN0356...    |                  |
| Nr.4   | 48    | 2,845           | 56             | 10             | 18             | 3,5             | 2,7  | 3   | 2,4   | AN0448...     | AN0448...    |                  |
| Nr.5   | 44    | 3,175           | 56             | 10             | 18             | 3,5             | 2,7  | 3   | 2,7   | AN0544...     | AN0544...    |                  |
| Nr.6   | 40    | 3,505           | 56             | 11             | 20             | 4               | 3    | 3   | 2,95  | AN0640...     | AN0640...    | AN0640...        |
| Nr.8   | 36    | 4,166           | 63             | 12             | 21             | 4,5             | 3,4  | 3   | 3,5   | AN0836...     | AN0836...    | AN0836...        |
| Nr.10  | 32    | 4,826           | 70             | 14             | 24,5           | 6               | 4,9  | 3   | 4,1   | AN1032...     | AN1032...    | AN1032...        |
| Nr.12  | 28    | 5,486           | 80             | 16             | 26,5           | 6               | 4,9  | 3   | 4,6   | AN1228...     | AN1228...    | AN1228...        |
| 1/4"   | 28    | 6,35            | 80             | 16             | 30             | 7               | 5,5  | 3   | 5,5   | ANA140...     | ANA140...    | ANA140...        |
| 5/16"  | 24    | 7,938           | 90             | 18             | -              | 6               | 4,9  | 3   | 6,9   | ANB516...     | ANB516...    | ANB516...        |
| 3/8"   | 24    | 9,525           | 90             | 18             | -              | 7               | 5,5  | 3   | 8,5   | ANC380...     | ANC380...    | ANC380...        |
| 7/16"  | 20    | 11,113          | 100            | 20             | -              | 8               | 6,2  | 3   | 9,9   | AND716...     | AND716...    | AND716...        |
| 1/2"   | 20    | 12,7            | 100            | 22             | -              | 9               | 7    | 3   | 11,5  | ANE120...     | ANE120...    | ANE120...        |
| 9/16"  | 18    | 14,288          | 100            | 22             | -              | 11              | 9    | 3   | 12,9  | ANF916...     | ANF916...    | ANF916...        |
| 5/8"   | 18    | 15,875          | 100            | 22             | -              | 12              | 9    | 3   | 14,5  | ANG580...     | ANG580...    | ANG580...        |
| 3/4"   | 16    | 19,05           | 110            | 25             | -              | 14              | 11   | 4   | 17,5  | ANH340...     | ANH340...    | ANH340...        |
| 7/8"   | 14    | 22,225          | 125            | 25             | -              | 18              | 14,5 | 4   | 20,4  | ANL780...     | ANL780...    |                  |
| 1"     | 12    | 25,4            | 140            | 28             | -              | 18              | 14,5 | 4   | 23,25 | ANM100...     | ANM100...    |                  |
| 1 1/8" | 12    | 28,575          | 150            | 28             | -              | 22              | 18   | 4   | 26,5  | ANN118...     |              |                  |
| 1 1/4" | 12    | 31,75           | 150            | 28             | -              | 22              | 18   | 4   | 29,5  | ANP114...     |              |                  |
| 1 3/8" | 12    | 34,925          | 170            | 30             | -              | 28              | 22   | 5   | 32,75 | ANQ138...     |              |                  |
| 1 1/2" | 12    | 38,1            | 170            | 30             | -              | 28              | 22   | 5   | 36    | ANR112...     |              |                  |



A66  
BRIGHTA  
SERIESDIN 2184-1  
≤ Ø 1/4"DIN 2184-1  
≥ Ø 5/16"

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A66<br>BRIGHT |  |  |  |
|-----|-------|---------------|--|--|--|
| N   | N.1-2 | • 12-15       |  |  |  |
|     | N.5-6 | • 10-12       |  |  |  |
| S   | S.1   | • 6-8         |  |  |  |
|     | S.3   | • 6-8         |  |  |  |

2B



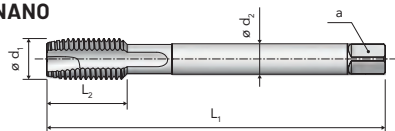
| UNF   | P    | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A66<br>BRIGHT<br>...0662A1MA0 |  |  |  |
|-------|------|-----------------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|-------------------------------|--|--|--|
| [TPI] | [mm] | [mm]            | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                               |  |  |  |
| Nr.2  | 64   | 2,184           | 45                      | 8              | 13             | 2,8                   | 2,1      | 2   | 1,85 | AN0264...                     |  |  |  |
| Nr.3  | 56   | 2,515           | 50                      | 9              | 15             | 2,8                   | 2,1      | 2   | 2,15 | AN0356...                     |  |  |  |
| Nr.4  | 48   | 2,845           | 56                      | 10             | 18             | 3,5                   | 2,7      | 2   | 2,4  | AN0448...                     |  |  |  |
| Nr.5  | 44   | 3,175           | 56                      | 10             | 18             | 3,5                   | 2,7      | 2   | 2,7  | AN0544...                     |  |  |  |
| Nr.6  | 40   | 3,505           | 56                      | 11             | 20             | 4                     | 3        | 2   | 2,95 | AN0640...                     |  |  |  |
| Nr.8  | 36   | 4,166           | 63                      | 12             | 21             | 4,5                   | 3,4      | 2   | 3,5  | AN0836...                     |  |  |  |
| Nr.10 | 32   | 4,826           | 70                      | 14             | 24,5           | 6                     | 4,9      | 2   | 4,1  | AN1032...                     |  |  |  |
| Nr.12 | 28   | 5,486           | 80                      | 16             | 26,5           | 6                     | 4,9      | 2   | 4,6  | AN1228...                     |  |  |  |
| 1/4"  | 28   | 6,35            | 80                      | 16             | 30             | 7                     | 5,5      | 2   | 5,5  | ANA140...                     |  |  |  |
| 5/16" | 24   | 7,938           | 90                      | 18             | -              | 6                     | 4,9      | 2   | 6,9  | ANB516...                     |  |  |  |
| 3/8"  | 24   | 9,525           | 90                      | 18             | -              | 7                     | 5,5      | 2   | 8,5  | ANC380...                     |  |  |  |



**A119**  
BRIGHT

**A119**  
TiN

## NORM VERGNANO



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A119<br>BRIGHT | A119<br>TIN |  |  |
|-----|-------|----------------|-------------|--|--|
| P   | P.2   | ● 20-25        | ● 30-35     |  |  |
|     | P.3   | ● 15-20        | ● 25-30     |  |  |
|     | P.4   | ● 12-15        | ● 20-25     |  |  |
|     | P.5   |                | ● 10-15     |  |  |
|     | P.7   |                | ● 8-10      |  |  |
| M   | M.1   |                | ● 8-10      |  |  |
| K   | K.2   | ● 15-20        | ● 25-30     |  |  |
| N   | N.2-3 | ● 20-25        | ● 30-35     |  |  |
|     | N.6   | ● 15-18        | ● 25-30     |  |  |

2B

2B



2,5xD

2,5x10

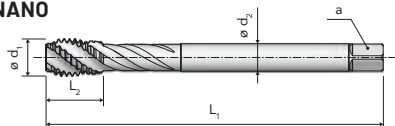
[illegible]



**A160**  
BRIGHT

**A160**  
TiN

## NORM VERGNANO



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A160<br>BRIGHT | A160<br>TIN |  |  |
|-----|-----|----------------|-------------|--|--|
| P   | P.2 | ● 15-20        | ● 25-30     |  |  |
|     | P.3 | ● 12-15        | ● 20-25     |  |  |
|     | P.4 | ● 10-12        | ● 15-20     |  |  |
|     | P.5 |                | ● 5-10      |  |  |
|     | P.7 |                | ● 6-8       |  |  |
| M   | M.1 |                | ● 6-8       |  |  |
| K   | K.2 | ● 12-15        | ● 20-25     |  |  |
| N   | N.3 | ● 15-18        | ● 25-30     |  |  |
|     | N.6 | ● 15-18        | ● 25-30     |  |  |

2B

2B





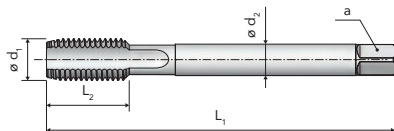


HSSE

**A26 FC**  
BRIGHT

**A26 FP**  
BRIGHT

DIN 5156



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A26 FC<br>BRIGHT | A26 FP<br>BRIGHT |  |  |
|-----|-----|------------------|------------------|--|--|
| P   | P.2 | ● 10-12          | ● 10-12          |  |  |
|     | P.3 | ● 8-10           | ● 8-10           |  |  |
| K   | K 2 | ● 8-10           | ● 8-10           |  |  |

**ISO  
5969**

**ISO  
5969**

[illegible]

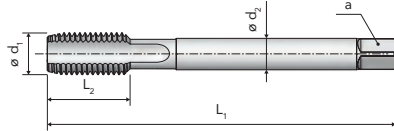


HSSE

A48  
NITRIDED

A48  
TiCN

DIN 5156



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG     | A48<br>NITRIDED | A48<br>TiCN |  |  |
|-----|--------|-----------------|-------------|--|--|
| K   | K.1    | • 15-20         | • 40-45     |  |  |
| N   | N.4    | • 15-20         | • 40-45     |  |  |
|     | N.7    | • 15-20         | • 40-45     |  |  |
|     | N.9-10 | • 20-25         | • 45-50     |  |  |

ISO  
5969 X

ISO  
5969 X

C (2-3)

C (2-3)

2,5xD

2,5xD

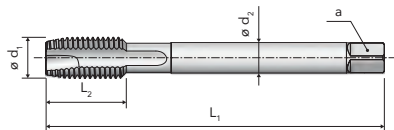
RH

RH

| G      | P  | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z |       | A48<br>NITRIDED<br>...0482A1LCO | A48<br>TiCN<br>...0482A1LEO |  |  |
|--------|----|-----------------|-------------------------|----------------|----------------|-----------------------|----------|---|-------|---------------------------------|-----------------------------|--|--|
| 1/8"   | 28 | 9,728           | 90                      | 18             | -              | 7                     | 5,5      | 4 | 8,8   | AGA180...                       | AGA180...                   |  |  |
| 1/4"   | 19 | 13,157          | 100                     | 22             | -              | 11                    | 9        | 4 | 11,8  | AGB140...                       | AGB140...                   |  |  |
| 3/8"   | 19 | 16,662          | 100                     | 22             | -              | 12                    | 9        | 4 | 15,25 | AGC380...                       | AGC380...                   |  |  |
| 1/2"   | 14 | 20,955          | 125                     | 25             | -              | 16                    | 12       | 4 | 19    | AGD120...                       | AGD120...                   |  |  |
| 5/8"   | 14 | 22,911          | 125                     | 25             | -              | 18                    | 14,5     | 4 | 21    | AGE580...                       | AGE580...                   |  |  |
| 3/4"   | 14 | 26,441          | 140                     | 28             | -              | 20                    | 16       | 5 | 24,5  | AGF340...                       | AGF340...                   |  |  |
| 7/8"   | 14 | 30,201          | 150                     | 28             | -              | 22                    | 18       | 5 | 28,25 | AGG780...                       | AGG780...                   |  |  |
| 1"     | 11 | 33,249          | 160                     | 30             | -              | 25                    | 20       | 5 | 30,75 | AGH100...                       | AGH100...                   |  |  |
| 1 1/8" | 11 | 37,897          | 170                     | 30             | -              | 28                    | 22       | 6 | 35,5  | AGL118...                       |                             |  |  |
| 1 1/4" | 11 | 41,91           | 170                     | 30             | -              | 32                    | 24       | 6 | 39,5  | AGM114...                       |                             |  |  |
| 1 1/2" | 11 | 47,803          | 190                     | 32             | -              | 36                    | 29       | 6 | 45,25 | AGP112...                       |                             |  |  |

A18 S  
BRIGHTA18 S  
VAPA18 S  
TiCNA18 S  
TiX2

DIN 5156



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A18 S<br>BRIGHT | A18 S<br>VAP | A18 S<br>TiCN | A18 S<br>TiX2 |
|-----|-------|-----------------|--------------|---------------|---------------|
| P   | P.2   | • 20-25         | • 20-25      | • 30-35       |               |
|     | P.3   | • 15-20         | • 15-20      | • 25-30       |               |
|     | P.4   | • 12-15         | • 12-15      | • 20-25       |               |
|     | P.5   |                 |              | • 10-15       |               |
|     | P.7   |                 |              | • 8-10        | • 10-12       |
| M   | M.1   |                 |              | • 8-10        | • 10-12       |
| K   | K.2   | • 15-20         | • 15-20      | • 25-30       |               |
| N   | N.2-3 | • 20-25         | • 20-25      | • 30-35       |               |
|     | N.6   | • 15-18         | • 15-18      | • 25-30       |               |

ISO  
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5969ISO  
5969ISO  
5969

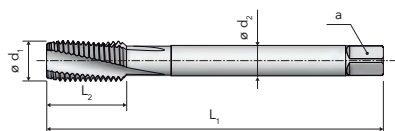
| G      | P    | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |       | A18 S<br>BRIGHT<br>...0182B2LA0 | A18 S<br>VAP<br>...0182B2LB0 | A18 S<br>TiCN<br>...0182B2LE0 | A18 S<br>TiX2<br>...0182B2LL0 |
|--------|------|-----------------|-------------------------|----------------|----------------|-----------------------|----------|-----|-------|---------------------------------|------------------------------|-------------------------------|-------------------------------|
| [TPI]  | [mm] | [mm]            | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm]  |                                 |                              |                               |                               |
| 1/8"   | 28   | 9,728           | 90                      | 18             | -              | 7                     | 5,5      | 4   | 8,8   | AGA180...                       | AGA180...                    | AGA180...                     | AGA180...                     |
| 1/4"   | 19   | 13,157          | 100                     | 22             | -              | 11                    | 9        | 4   | 11,8  | AGB140...                       | AGB140...                    | AGB140...                     | AGB140...                     |
| 3/8"   | 19   | 16,662          | 100                     | 22             | -              | 12                    | 9        | 4   | 15,25 | AGC380...                       | AGC380...                    | AGC380...                     | AGC380...                     |
| 1/2"   | 14   | 20,955          | 125                     | 25             | -              | 16                    | 12       | 4   | 19    | AGD120...                       | AGD120...                    | AGD120...                     | AGD120...                     |
| 5/8"   | 14   | 22,911          | 125                     | 25             | -              | 18                    | 14,5     | 4   | 21    | AGE580...                       | AGE580...                    | AGE580...                     | AGE580...                     |
| 3/4"   | 14   | 26,441          | 140                     | 28             | -              | 20                    | 16       | 4   | 24,5  | AGF340...                       | AGF340...                    | AGF340...                     | AGF340...                     |
| 7/8"   | 14   | 30,201          | 150                     | 28             | -              | 22                    | 18       | 4   | 28,25 | AGG780...                       | AGG780...                    | AGG780...                     | AGG780...                     |
| 1"     | 11   | 33,249          | 160                     | 30             | -              | 25                    | 20       | 4   | 30,75 | AGH100...                       | AGH100...                    | AGH100...                     | AGH100...                     |
| 1 1/8" | 11   | 37,897          | 170                     | 30             | -              | 28                    | 22       | 5   | 35,5  | AGL118...                       |                              |                               |                               |
| 1 1/4" | 11   | 41,91           | 170                     | 30             | -              | 32                    | 24       | 5   | 39,5  | AGM114...                       |                              |                               |                               |
| 1 1/2" | 11   | 47,803          | 190                     | 32             | -              | 36                    | 29       | 5   | 45,25 | AGP112...                       |                              |                               |                               |



**A32**  
BRIGHT

**A32**  
TiN

DIN 5156



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A32     | A32     |  |  |
|-----|-------|---------|---------|--|--|
|     |       | BRIGHT  | TiN     |  |  |
| P   | P.1   | ● 18-20 | ● 30-35 |  |  |
|     | P.2   | ● 15-18 | ● 25-30 |  |  |
|     | P.3   | ● 12-15 | ● 20-25 |  |  |
|     | P.4   | ● 10-12 | ● 15-20 |  |  |
|     | P.5   |         | ● 5-10  |  |  |
| K   | K.2   | ● 12-15 | ● 20-25 |  |  |
| N   | N.1   | ● 18-20 |         |  |  |
|     | N.2-3 | ● 15-18 | ● 25-30 |  |  |
|     | N.5   | ● 15-18 |         |  |  |
|     | N.6   | ● 12-15 | ● 20-25 |  |  |

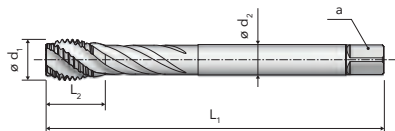
**ISO  
5969**

**ISO  
5969**

[illegible]

A59 S  
BRIGHTA59 S  
VAPA59 S  
TiNA59 S  
TiCN

DIN 5156



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A59 S<br>BRIGHT | A59 S<br>VAP | A59 S<br>TiN | A59 S<br>TiCN |
|-----|-----|-----------------|--------------|--------------|---------------|
| P   | P.2 | ● 15-20         | ● 15-20      | ● 25-30      | ● 25-30       |
|     | P.3 | ● 12-15         | ● 12-15      | ● 20-25      | ● 20-25       |
|     | P.4 | ● 10-12         | ● 10-12      | ● 15-20      | ● 15-20       |
|     | P.5 |                 |              | ● 5-10       | ● 5-10        |
|     | P.7 |                 |              | ● 6-8        | ● 6-8         |
| M   | M.1 |                 |              | ● 6-8        | ● 6-8         |
| K   | K.2 | ● 12-15         | ● 12-15      | ● 20-25      | ● 20-25       |
| N   | N.3 | ● 15-18         | ● 15-18      | ● 25-30      | ● 25-30       |
|     | N.6 | ● 15-18         | ● 15-18      | ● 25-30      | ● 25-30       |

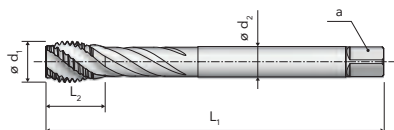
ISO  
5969ISO  
5969ISO  
5969ISO  
5969

| G      | P  | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z |       | A59 S<br>BRIGHT<br>...0592B1LA0 | A59 S<br>VAP<br>...0592B1LB0 | A59 S<br>TiN<br>...0592B1LD0 | A59 S<br>TiCN<br>...0592B1LE0 |
|--------|----|-----------------|-------------------------|----------------|----------------|-----------------------|----------|---|-------|---------------------------------|------------------------------|------------------------------|-------------------------------|
| 1/8"   | 28 | 9,728           | 90                      | 17             | -              | 7                     | 5,5      | 3 | 8,8   | AGA180...                       | AGA180...                    | AGA180...                    | AGA180...                     |
| 1/4"   | 19 | 13,157          | 100                     | 23             | -              | 11                    | 9        | 4 | 11,8  | AGB140...                       | AGB140...                    | AGB140...                    | AGB140...                     |
| 3/8"   | 19 | 16,662          | 100                     | 23             | -              | 12                    | 9        | 4 | 15,25 | AGC380...                       | AGC380...                    | AGC380...                    | AGC380...                     |
| 1/2"   | 14 | 20,955          | 125                     | 29             | -              | 16                    | 12       | 5 | 19    | AGD120...                       | AGD120...                    | AGD120...                    | AGD120...                     |
| 5/8"   | 14 | 22,911          | 125                     | 29             | -              | 18                    | 14,5     | 5 | 21    | AGE580...                       | AGE580...                    | AGE580...                    | AGE580...                     |
| 3/4"   | 14 | 26,441          | 140                     | 29             | -              | 20                    | 16       | 5 | 24,5  | AGF340...                       | AGF340...                    | AGF340...                    | AGF340...                     |
| 7/8"   | 14 | 30,201          | 150                     | 32             | -              | 22                    | 18       | 5 | 28,25 | AGG780...                       | AGG780...                    | AGG780...                    | AGG780...                     |
| 1"     | 11 | 33,249          | 160                     | 34,5           | -              | 25                    | 20       | 5 | 30,75 | AGH100...                       | AGH100...                    | AGH100...                    | AGH100...                     |
| 1 1/8" | 11 | 37,897          | 170                     | 34,5           | -              | 28                    | 22       | 5 | 35,5  | AGL118...                       | AGL118...                    |                              |                               |
| 1 1/4" | 11 | 41,91           | 170                     | 34,5           | -              | 32                    | 24       | 5 | 39,5  | AGM114...                       | AGM114...                    |                              |                               |
| 1 1/2" | 11 | 47,803          | 190                     | 37,5           | -              | 36                    | 29       | 6 | 45,25 | AGP112...                       | AGP112...                    |                              |                               |



**A59 S**  
TiX2

DIN 5156

A  
SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A59 S<br>TIX2 |  |  |  |
|-----|-----|---------------|--|--|--|
| P   | P.7 | ● 6-8         |  |  |  |
| M   | M.1 | ● 6-8         |  |  |  |

**ISO  
5969**

[illegible]

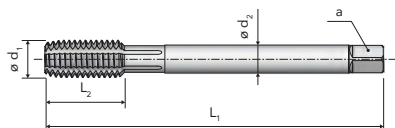


HSSE

A82 N

TiN

DIN 2189



APPLICATION RANGE - CUTTING SPEED m/min

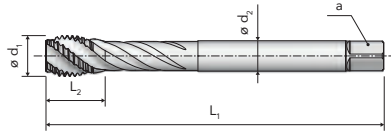
| ISO | MG    | A82 N<br>TIN |  |  |  |
|-----|-------|--------------|--|--|--|
| P   | P.1-2 | ● 20-25      |  |  |  |
|     | P.3   | ● 15-20      |  |  |  |
| N   | N.1-2 | ● 20-25      |  |  |  |
|     | N.3   | ● 15-20      |  |  |  |
|     | N.5-6 | ● 20-25      |  |  |  |

ISO  
5969 X

[illegible]


**A159 S**  
BRIGHT

**A159 S**  
TiN

**DIN 5156**

**A** SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO      | MG  | A159 S<br>BRIGHT | A159 S<br>TiN |  |  |
|----------|-----|------------------|---------------|--|--|
| <b>P</b> | P.2 | ● 15-20          | ● 25-30       |  |  |
|          | P.3 | ● 12-15          | ● 20-25       |  |  |
|          | P.4 | ● 10-12          | ● 15-20       |  |  |
|          | P.5 |                  | ● 5-10        |  |  |
|          | P.7 |                  | ● 6-8         |  |  |
| <b>M</b> | M.1 |                  | ● 6-8         |  |  |
| <b>K</b> | K.2 | ● 12-15          | ● 20-25       |  |  |
| <b>N</b> | N.3 | ● 15-18          | ● 25-30       |  |  |
|          | N.6 | ● 15-18          | ● 25-30       |  |  |



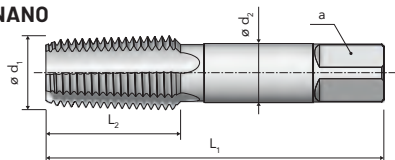
| Rp          | P    | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | A159 S<br>BRIGHT<br>...1592B1LA0 | A159 S<br>TiN<br>...1592B1LD0 |  |  |
|-------------|------|-----------------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|----------------------------------|-------------------------------|--|--|
| [TPI]       | [mm] | [mm]            | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                  |                               |  |  |
| <b>1/8"</b> | 28   | 9,728           | 90                      | 17             | -              | 7                     | 5,5      | 3   | 8,6  | AGA180...                        | AGA180...                     |  |  |
| <b>1/4"</b> | 19   | 13,157          | 100                     | 23             | -              | 11                    | 9        | 4   | 11,5 | AGB140...                        | AGB140...                     |  |  |
| <b>3/8"</b> | 19   | 16,662          | 100                     | 23             | -              | 12                    | 9        | 4   | 15   | AGC380...                        | AGC380...                     |  |  |
| <b>1/2"</b> | 14   | 20,955          | 125                     | 29             | -              | 16                    | 12       | 5   | 18,5 | AGD120...                        | AGD120...                     |  |  |
| <b>3/4"</b> | 14   | 26,441          | 140                     | 29             | -              | 20                    | 16       | 5   | 24   | AGF340...                        | AGF340...                     |  |  |



**A6**  
BRIGHT

A  
SERIES

## NORM VERGNANO



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A6<br>BRIGHT |  |  |  |
|-----|-----|--------------|--|--|--|
| P   | P.2 | ● 10-15      |  |  |  |
|     | P.3 | ● 10-12      |  |  |  |
|     | P.4 | ● 8-10       |  |  |  |
| K   | K 2 | ● 10-12      |  |  |  |

[illegible]

(a) = Cylindrical hole (see page 252)



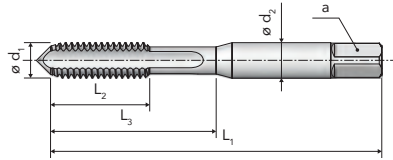
**A4**  
ROUGHING

**A4**  
SECOND

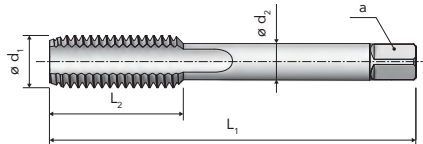
**A4**  
FINISHING

**A4**  
SET

**DIN 2184-2**  
≤ Ø 1/4"



**DIN 2184-2**  
≥ Ø 5/16"



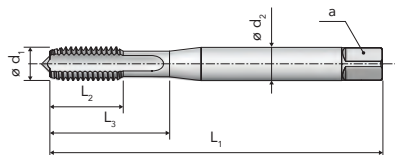
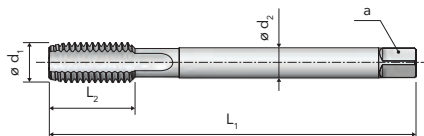
A  
SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A4<br>ROUGHING | A4<br>SECOND | A4<br>FINISHING | A4<br>SET |
|-----|-------|----------------|--------------|-----------------|-----------|
| P   | P.1-4 | •              | •            | •               | •         |
|     | P.7   | •              | •            | •               | •         |
| K   | K.2   | •              | •            | •               | •         |
| N   | N.1-3 | •              | •            | •               | •         |
|     | N.5-7 | •              | •            | •               | •         |



| BSW    | P<br>[TPI] | Ød <sub>1</sub><br>[mm] | L <sub>1</sub><br>js 16<br>[mm] | L <sub>2</sub><br>[mm] | L <sub>3</sub><br>[mm] | Ød <sub>2</sub><br>h9<br>[mm] | a<br>h12<br>[mm] | z | z<br>[-] | z<br>[mm] | A4<br>ROUGHING<br>...0041A1LA0 | A4<br>SECOND<br>...0041A2LA0 | A4<br>FINISHING<br>...0041A3LA0 | A4<br>SET<br>...0041ASLA0 |
|--------|------------|-------------------------|---------------------------------|------------------------|------------------------|-------------------------------|------------------|---|----------|-----------|--------------------------------|------------------------------|---------------------------------|---------------------------|
| 3/32"  | 48         | 2,381                   | 40                              | 9                      | 15                     | 2,8                           | 2,1              | 3 | 1,9      | 1,9       | AEA332...                      | AEA332...                    | AEA332...                       | AEA332...                 |
| 1/8"   | 40         | 3,175                   | 40                              | 10                     | 18                     | 3,5                           | 2,7              | 3 | 2,55     | 2,55      | AEB180...                      | AEB180...                    | AEB180...                       | AEB180...                 |
| 5/32"  | 32         | 3,969                   | 45                              | 12                     | 21                     | 4,5                           | 3,4              | 3 | 3,2      | 3,2       | AEB532...                      | AEB532...                    | AEB532...                       | AEB532...                 |
| 3/16"  | 24         | 4,763                   | 50                              | 14                     | 23                     | 6                             | 4,9              | 3 | 3,7      | 3,7       | AEC316...                      | AEC316...                    | AEC316...                       | AEC316...                 |
| 7/32"  | 24         | 5,556                   | 56                              | 16                     | 28                     | 6                             | 4,9              | 3 | 4,5      | 4,5       | AEC732...                      | AEC732...                    | AEC732...                       | AEC732...                 |
| 1/4"   | 20         | 6,35                    | 56                              | 16                     | 28                     | 6                             | 4,9              | 3 | 5,1      | 5,1       | AED140...                      | AED140...                    | AED140...                       | AED140...                 |
| 5/16"  | 18         | 7,938                   | 63                              | 22                     | -                      | 6                             | 4,9              | 3 | 6,5      | 6,5       | AEE516...                      | AEE516...                    | AEE516...                       | AEE516...                 |
| 3/8"   | 16         | 9,525                   | 70                              | 24                     | -                      | 7                             | 5,5              | 3 | 7,9      | 7,9       | AEF380...                      | AEF380...                    | AEF380...                       | AEF380...                 |
| 7/16"  | 14         | 11,113                  | 70                              | 24                     | -                      | 8                             | 6,2              | 3 | 9,25     | 9,25      | AEF716...                      | AEF716...                    | AEF716...                       | AEF716...                 |
| 1/2"   | 12         | 12,7                    | 75                              | 28                     | -                      | 9                             | 7                | 4 | 10,5     | 10,5      | AEG120...                      | AEG120...                    | AEG120...                       | AEG120...                 |
| 9/16"  | 12         | 14,288                  | 80                              | 28                     | -                      | 11                            | 9                | 4 | 12       | 12        | AEG916...                      | AEG916...                    | AEG916...                       | AEG916...                 |
| 5/8"   | 11         | 15,875                  | 80                              | 30                     | -                      | 12                            | 9                | 4 | 13,5     | 13,5      | AEH580...                      | AEH580...                    | AEH580...                       | AEH580...                 |
| 3/4"   | 10         | 19,05                   | 95                              | 32                     | -                      | 14                            | 11               | 4 | 16,4     | 16,4      | AEL340...                      | AEL340...                    | AEL340...                       | AEL340...                 |
| 7/8"   | 9          | 22,225                  | 100                             | 32                     | -                      | 18                            | 14,5             | 4 | 19,25    | 19,25     | AEM780...                      | AEM780...                    | AEM780...                       | AEM780...                 |
| 1"     | 8          | 25,4                    | 110                             | 36                     | -                      | 18                            | 14,5             | 4 | 22       | 22        | AEP100...                      | AEP100...                    | AEP100...                       | AEP100...                 |
| 1 1/8" | 7          | 28,575                  | 125                             | 40                     | -                      | 22                            | 18               | 4 | 24,75    | 24,75     | AEP118...                      | AEP118...                    | AEP118...                       | AEP118...                 |
| 1 1/4" | 7          | 31,75                   | 125                             | 40                     | -                      | 22                            | 18               | 4 | 27,75    | 27,75     | AEQ114...                      | AEQ114...                    | AEQ114...                       | AEQ114...                 |

A24 FC  
BRIGHTA24 FP  
BRIGHTDIN 2184-1  
≤ Ø 3/8"DIN 2184-1  
≥ Ø 7/16"

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A24 FC<br>BRIGHT | A24 FP<br>BRIGHT |  |  |
|-----|-----|------------------|------------------|--|--|
| P   | P.2 | • 10-12          | • 10-12          |  |  |
|     | P.3 | • 8-10           | • 8-10           |  |  |
| K   | K.2 | • 8-10           | • 8-10           |  |  |

mc

mc



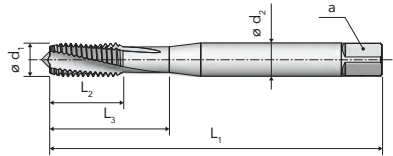
| BSW    | P    | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |       | A24 FC<br>BRIGHT<br>...0241A1LA0 | A24 FP<br>BRIGHT<br>...0241A2LA0 |  |  |
|--------|------|-----------------|-------------------------|----------------|----------------|-----------------------|----------|-----|-------|----------------------------------|----------------------------------|--|--|
| [TPI]  | [mm] | [mm]            | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm]  |                                  |                                  |  |  |
| 3/32"  | 48   | 2,381           | 50                      | 9              | 15             | 2,8                   | 2,1      | 3   | 1,9   | AEA332...                        | AEA332...                        |  |  |
| 1/8"   | 40   | 3,175           | 56                      | 11             | 17             | 3,5                   | 2,7      | 3   | 2,55  | AEB180...                        | AEB180...                        |  |  |
| 5/32"  | 32   | 3,969           | 63                      | 12             | 21             | 4,5                   | 3,4      | 3   | 3,2   | AEB532...                        | AEB532...                        |  |  |
| 3/16"  | 24   | 4,763           | 70                      | 14             | 24             | 6                     | 4,9      | 3   | 3,7   | AEC316...                        | AEC316...                        |  |  |
| 7/32"  | 24   | 5,556           | 80                      | 15             | 28             | 6                     | 4,9      | 3   | 4,5   | AEC732...                        | AEC732...                        |  |  |
| 1/4"   | 20   | 6,35            | 80                      | 16             | 29             | 7                     | 5,5      | 3   | 5,1   | AED140...                        | AED140...                        |  |  |
| 5/16"  | 18   | 7,938           | 90                      | 18             | 33             | 8                     | 6,2      | 3   | 6,5   | AEE516...                        | AEE516...                        |  |  |
| 3/8"   | 16   | 9,525           | 100                     | 20             | 36             | 10                    | 8        | 3   | 7,9   | AEF380...                        | AEF380...                        |  |  |
| 7/16"  | 14   | 11,113          | 100                     | 22             | -              | 8                     | 6,2      | 3   | 9,25  | AEF716...                        | AEF716...                        |  |  |
| 1/2"   | 12   | 12,7            | 110                     | 25             | -              | 9                     | 7        | 3   | 10,5  | AEG120...                        | AEG120...                        |  |  |
| 9/16"  | 12   | 14,288          | 110                     | 27             | -              | 11                    | 9        | 3   | 12    | AEG916...                        | AEG916...                        |  |  |
| 5/8"   | 11   | 15,875          | 110                     | 28             | -              | 12                    | 9        | 3   | 13,5  | AEH580...                        | AEH580...                        |  |  |
| 3/4"   | 10   | 19,05           | 125                     | 32             | -              | 14                    | 11       | 4   | 16,4  | AEL340...                        | AEL340...                        |  |  |
| 7/8"   | 9    | 22,225          | 140                     | 32             | -              | 18                    | 14,5     | 4   | 19,25 | AEM780...                        | AEM780...                        |  |  |
| 1"     | 8    | 25,4            | 160                     | 36             | -              | 18                    | 14,5     | 4   | 22    | AEP100...                        | AEP100...                        |  |  |
| 1 1/8" | 7    | 28,575          | 180                     | 40             | -              | 22                    | 18       | 4   | 24,75 | AEP118...                        | AEP118...                        |  |  |
| 1 1/4" | 7    | 31,75           | 180                     | 40             | -              | 22                    | 18       | 4   | 27,75 | AEQ114...                        | AEQ114...                        |  |  |
|        |      |                 |                         |                |                |                       |          |     |       |                                  |                                  |  |  |
|        |      |                 |                         |                |                |                       |          |     |       |                                  |                                  |  |  |
|        |      |                 |                         |                |                |                       |          |     |       |                                  |                                  |  |  |
|        |      |                 |                         |                |                |                       |          |     |       |                                  |                                  |  |  |
|        |      |                 |                         |                |                |                       |          |     |       |                                  |                                  |  |  |



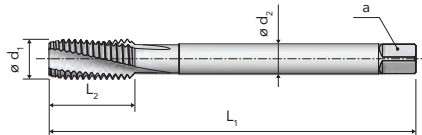
**A31**  
BRIGHT

**A31**  
TiN

**DIN 2184-1**  
≤ Ø 3/8"



**DIN 2184-1**  
≥ Ø 7/16"



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A31<br>BRIGHT | A31<br>TiN |  |  |
|-----|-------|---------------|------------|--|--|
| P   | P.1   | • 18-20       | • 30-35    |  |  |
|     | P.2   | • 15-18       | • 25-30    |  |  |
|     | P.3   | • 12-15       | • 20-25    |  |  |
|     | P.4   | • 10-12       | • 15-20    |  |  |
|     | P.5   |               | • 5-10     |  |  |
| K   | K.2   | • 12-15       | • 20-25    |  |  |
| N   | N.1   | • 18-20       |            |  |  |
|     | N.2-3 | • 15-18       | • 25-30    |  |  |
|     | N.5   | • 15-18       |            |  |  |
|     | N.6   | • 12-15       | • 20-25    |  |  |

mc

mc



| BSW    | P    | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   | z     |  | A31<br>BRIGHT<br>...0311A1LA0 | A31<br>TiN<br>...0311A1LD0 |  |  |
|--------|------|-----------------|-------------------------|----------------|----------------|-----------------------|----------|-----|-------|--|-------------------------------|----------------------------|--|--|
| [TPI]  | [mm] | [mm]            | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm]  |  |                               |                            |  |  |
| 3/32"  | 48   | 2,381           | 50                      | 9              | 15             | 2,8                   | 2,1      | 3   | 1,9   |  | AEA332...                     | AEA332...                  |  |  |
| 1/8"   | 40   | 3,175           | 56                      | 11             | 17             | 3,5                   | 2,7      | 3   | 2,55  |  | AEB180...                     | AEB180...                  |  |  |
| 5/32"  | 32   | 3,969           | 63                      | 12             | 21             | 4,5                   | 3,4      | 3   | 3,2   |  | AEB532...                     | AEB532...                  |  |  |
| 3/16"  | 24   | 4,763           | 70                      | 14             | 24             | 6                     | 4,9      | 3   | 3,7   |  | AEC316...                     | AEC316...                  |  |  |
| 7/32"  | 24   | 5,556           | 80                      | 15             | 28             | 6                     | 4,9      | 3   | 4,5   |  | AEC732...                     | AEC732...                  |  |  |
| 1/4"   | 20   | 6,35            | 80                      | 16             | 29             | 7                     | 5,5      | 3   | 5,1   |  | AED140...                     | AED140...                  |  |  |
| 5/16"  | 18   | 7,938           | 90                      | 18             | 33             | 8                     | 6,2      | 3   | 6,5   |  | AEE516...                     | AEE516...                  |  |  |
| 3/8"   | 16   | 9,525           | 100                     | 20             | 36             | 10                    | 8        | 3   | 7,9   |  | AEF380...                     | AEF380...                  |  |  |
| 7/16"  | 14   | 11,113          | 100                     | 22             | -              | 8                     | 6,2      | 3   | 9,25  |  | AEF716...                     | AEF716...                  |  |  |
| 1/2"   | 12   | 12,7            | 110                     | 25             | -              | 9                     | 7        | 3   | 10,5  |  | AG120...                      | AG120...                   |  |  |
| 9/16"  | 12   | 14,288          | 110                     | 27             | -              | 11                    | 9        | 3   | 12    |  | AG916...                      | AG916...                   |  |  |
| 5/8"   | 11   | 15,875          | 110                     | 28             | -              | 12                    | 9        | 3   | 13,5  |  | AEG580...                     | AEG580...                  |  |  |
| 3/4"   | 10   | 19,05           | 125                     | 32             | -              | 14                    | 11       | 4   | 16,4  |  | AEL340...                     | AEL340...                  |  |  |
| 7/8"   | 9    | 22,225          | 140                     | 32             | -              | 18                    | 14,5     | 4   | 19,25 |  | AEM780...                     | AEM780...                  |  |  |
| 1"     | 8    | 25,4            | 160                     | 36             | -              | 18                    | 14,5     | 4   | 22    |  | AEP100...                     | AEP100...                  |  |  |
| 1 1/8" | 7    | 28,575          | 180                     | 40             | -              | 22                    | 18       | 4   | 24,75 |  | AEP118...                     |                            |  |  |
| 1 1/4" | 7    | 31,75           | 180                     | 40             | -              | 22                    | 18       | 4   | 27,75 |  | AEQ114...                     |                            |  |  |
|        |      |                 |                         |                |                |                       |          |     |       |  |                               |                            |  |  |
|        |      |                 |                         |                |                |                       |          |     |       |  |                               |                            |  |  |
|        |      |                 |                         |                |                |                       |          |     |       |  |                               |                            |  |  |
|        |      |                 |                         |                |                |                       |          |     |       |  |                               |                            |  |  |
|        |      |                 |                         |                |                |                       |          |     |       |  |                               |                            |  |  |

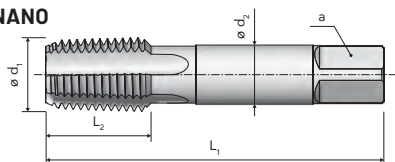


HSSE

**A6 B**  
BRIGHT

A  
SERIES

## NORM VERGNANO



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A6 B<br>BRIGHT |  |  |  |
|-----|-----|----------------|--|--|--|
| P   | P.2 | ● 10-15        |  |  |  |
|     | P.3 | ● 10-12        |  |  |  |
|     | P.4 | ● 8-10         |  |  |  |
| K   | K.2 | ● 10-12        |  |  |  |

[illegible]

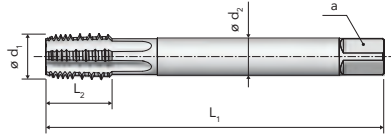
(a) = Cylindrical hole (see page 252)



**HSSE**

**A6 BZ**  
BRIGHT

DIN 374

A  
SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A6 BZ<br>BRIGHT |  |  |  |
|-----|-------|-----------------|--|--|--|
| P   | P.1   | ● 12-15         |  |  |  |
|     | P.7   | ● 2-3           |  |  |  |
| M   | M.1   | ● 2-3           |  |  |  |
| N   | N.1-2 | ● 12-15         |  |  |  |
|     | N.5   | ● 10-12         |  |  |  |
|     | N.6   | ● 6-8           |  |  |  |

[illegible]

(a)= Cylindrical hole (see page 252)

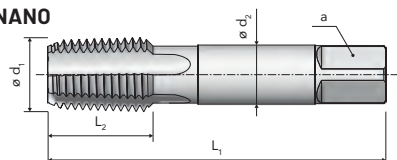


HSSE

**A6 F**  
BRIGHT

A  
SERIES

NORM VERGNANO



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | A6 F<br>BRIGHT |  |  |  |
|-----|-----|----------------|--|--|--|
| P   | P.2 | ● 10-15        |  |  |  |
|     | P.3 | ● 10-12        |  |  |  |
|     | P.4 | ● 8-10         |  |  |  |
| K   | K 2 | ● 10-12        |  |  |  |

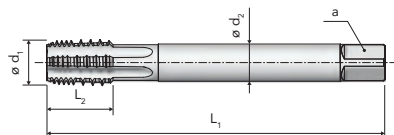
[illegible]

(a)= Cylindrical hole (see page 252)



**A6 FZ**  
BRIGHT

DIN 374



A SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | A6 FZ<br>BRIGHT |  |  |  |
|-----|-------|-----------------|--|--|--|
| P   | P.1   | ● 12-15         |  |  |  |
|     | P.7   | ● 2-3           |  |  |  |
| M   | M.1   | ● 2-3           |  |  |  |
| N   | N.1-2 | ● 12-15         |  |  |  |
|     | N.5   | ● 10-12         |  |  |  |
|     | N.6   | ● 6-8           |  |  |  |

[illegible]

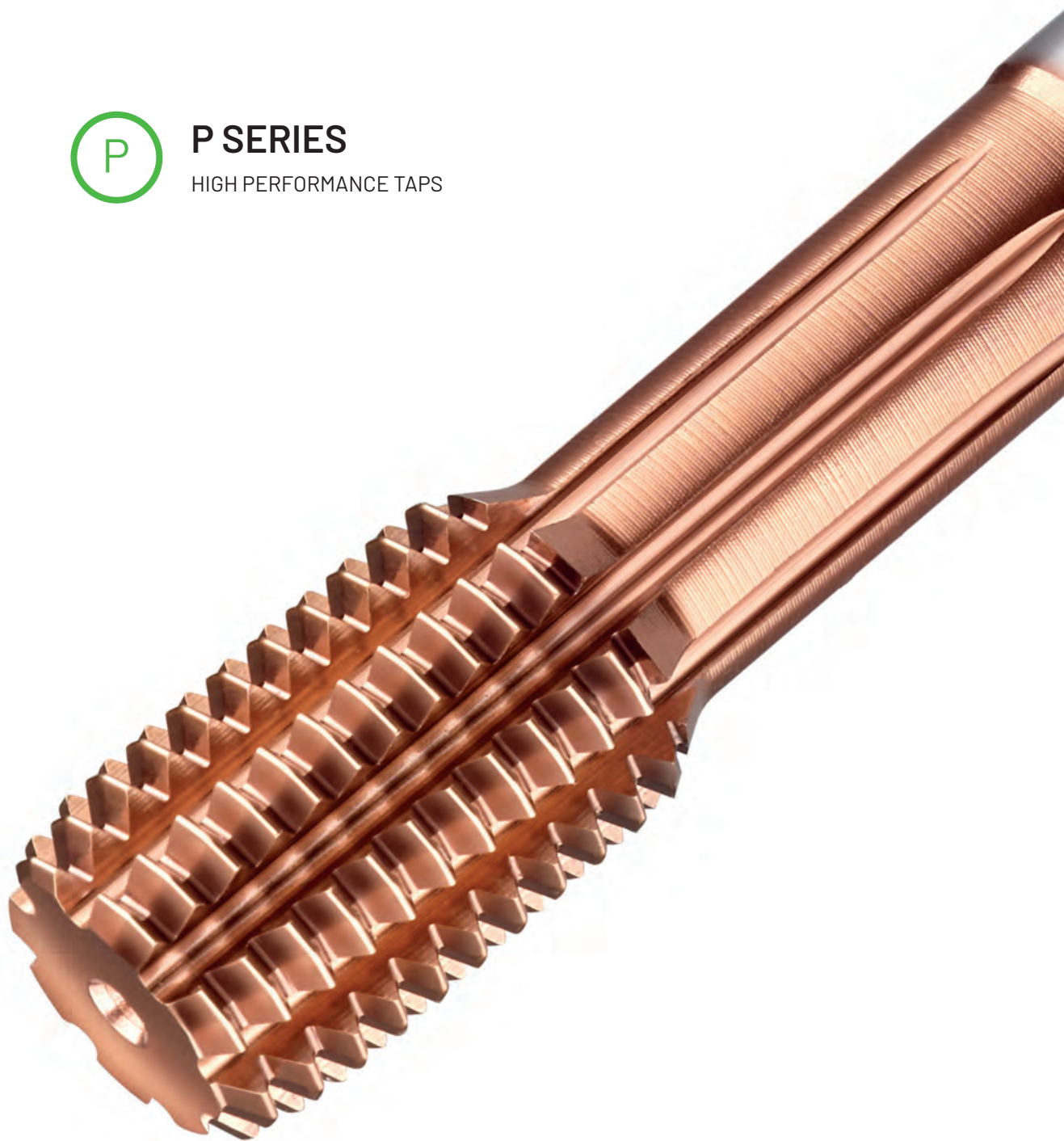
(a) = Cylindrical hole (see page 252)

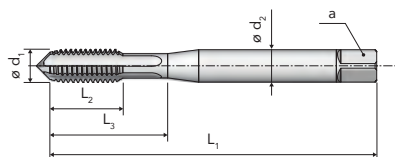
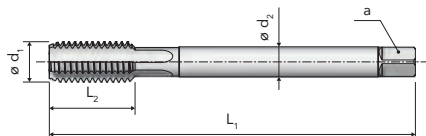




## P SERIES

HIGH PERFORMANCE TAPS



**P43**  
V-MAXX**BP43**  
V-MAXX**P43 E**  
V-MAXX**BP43 E**  
V-MAXX**DIN 371**  
≤ M10**DIN 376**  
≥ M12

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG     | P43<br>V-MAXX | BP43<br>V-MAXX | P43 E<br>V-MAXX | BP43 E<br>V-MAXX |
|-----|--------|---------------|----------------|-----------------|------------------|
| K   | K.1    | ● 40-50       | ● 40-50        | ● 40-50         | ● 40-50          |
| N   | N.4    | ● 40-50       | ● 40-50        | ● 40-50         | ● 40-50          |
|     | N.7    | ● 40-50       | ● 40-50        | ● 40-50         | ● 40-50          |
|     | N.9-10 | ● 45-55       | ● 45-55        | ● 45-55         | ● 45-55          |

**6HX****6HX****6HX****6HX**

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | P43<br>V-MAXX<br>...0435A1AV0 | BP43<br>V-MAXX<br>...0435M1AV0 | P43 E<br>V-MAXX<br>...0435A3AV0 | BP43 E<br>V-MAXX<br>...0435M3AV0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|-------------------------------|--------------------------------|---------------------------------|----------------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                               |                                |                                 |                                  |
| <b>M 3</b>      | 0,5  | 56                      | 10             | 18             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                     |                                |                                 |                                  |
| <b>4</b>        | 0,7  | 63                      | 12             | 21             | 4,5                   | 3,4      | 4   | 3,3  | A00040...                     |                                | A00040...                       |                                  |
| <b>5</b>        | 0,8  | 70                      | 14             | 24,5           | 6                     | 4,9      | 4   | 4,2  | A00050...                     | A00050...                      | A00050...                       | A00050...                        |
| <b>6</b>        | 1    | 80                      | 16             | 29             | 6                     | 4,9      | 4   | 5    | A00060...                     | A00060...                      | A00060...                       | A00060...                        |
| <b>8</b>        | 1,25 | 90                      | 18             | 33             | 8                     | 6,2      | 4   | 6,8  | A00080...                     | A00080...                      | A00080...                       | A00080...                        |
| <b>10</b>       | 1,5  | 100                     | 20             | 36             | 10                    | 8        | 4   | 8,5  | A00100...                     | A00100...                      | A00100...                       | A00100...                        |
| <b>12</b>       | 1,75 | 110                     | 24             | -              | 9                     | 7        | 4   | 10,2 | A00120...                     | A00120...                      | A00120...                       | A00120...                        |
| <b>14</b>       | 2    | 110                     | 25             | -              | 11                    | 9        | 4   | 12   | A00140...                     | A00140...                      |                                 |                                  |
| <b>16</b>       | 2    | 110                     | 28             | -              | 12                    | 9        | 4   | 14   | A00160...                     | A00160...                      |                                 |                                  |
| <b>18</b>       | 2,5  | 125                     | 32             | -              | 14                    | 11       | 4   | 15,5 | A00180...                     | A00180...                      |                                 |                                  |
| <b>20</b>       | 2,5  | 140                     | 32             | -              | 16                    | 12       | 4   | 17,5 | A00200...                     | A00200...                      |                                 |                                  |

HIGH PERFORMANCE MACHINE TAPS for blind and through holes  
Straight flutes / for high strength materials



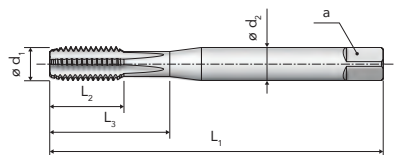
HSSP



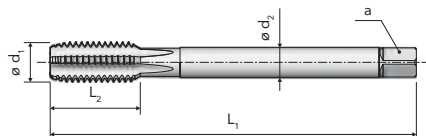
**P130**  
BRIGHT

**P130**  
V-MAXX

**DIN 371**  
≤ M10



**DIN 376**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

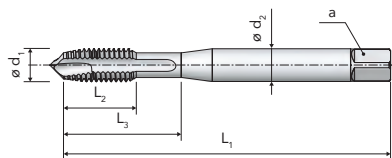
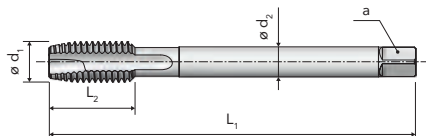
| ISO | MG  | P130<br>BRIGHT | P130<br>V-MAXX |  |  |
|-----|-----|----------------|----------------|--|--|
| P   | P.6 | ● 2-3          | ● 5-8          |  |  |
| N   | N.8 | ● 3-5          | ● 8-10         |  |  |

6HX

6HX

[illegible]

(\*)= The hole diameters are oversized

P15  
TiNP15  
TiH1P15 6GX  
TiH1BP15  
TiH1DIN 371  
≤ M10DIN 376  
≥ M12

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P15<br>TiN | P15<br>TiH1 | P15 6GX<br>TiH1 | BP15<br>TiH1 |
|-----|-------|------------|-------------|-----------------|--------------|
| P   | P.3   | • 25-35    | • 25-35     | • 25-35         | • 25-35      |
|     | P.4   | • 20-30    | • 20-30     | • 20-30         | • 20-30      |
|     | P.5   | • 10-20    | • 10-20     | • 10-20         | • 10-20      |
|     | P.6   | • 8-10     | • 8-10      | • 8-10          | • 8-10       |
|     | P.7   | • 10-15    | • 10-15     | • 10-15         | • 10-15      |
| M   | M.1   | • 10-15    | • 10-15     | • 10-15         | • 10-15      |
|     | M.2   | • 6-8      | • 6-8       | • 6-8           | • 6-8        |
| K   | K.2   | • 25-35    | • 25-35     | • 25-35         | • 25-35      |
| N   | N.2-3 | • 30-40    | • 30-40     | • 30-40         | • 30-40      |
|     | N.6   | • 25-35    | • 25-35     | • 25-35         | • 25-35      |

6HX



6HX



6GX



6HX



| Ød1    | P    | L1<br>js 16 | L2   | L3   | Ød2<br>h9 | a<br>h12 | z   |      | P15<br>TiN<br>...0154A2AD0 | P15<br>TiH1<br>...0154A2AH0 | P15 6GX<br>TiH1<br>...0154A2CH0 | BP15<br>TiH1<br>...0154M2AH0 |
|--------|------|-------------|------|------|-----------|----------|-----|------|----------------------------|-----------------------------|---------------------------------|------------------------------|
| [mm]   | [mm] | [mm]        | [mm] | [mm] | [mm]      | [mm]     | [-] | [mm] |                            |                             |                                 |                              |
| M1(*)  | 0,25 | 40          | 5,5  | 7,5  | 2,5       | 2,1      | 2   | 0,75 | A00010...                  | A00010...                   |                                 |                              |
| 1,2(*) | 0,25 | 40          | 5,5  | 7,5  | 2,5       | 2,1      | 2   | 0,95 | A00012...                  | A00012...                   |                                 |                              |
| 1,4(*) | 0,3  | 40          | 7    | 10   | 2,5       | 2,1      | 2   | 1,1  | A00014...                  | A00014...                   |                                 |                              |
| 1,6    | 0,35 | 40          | 8    | 11   | 2,5       | 2,1      | 2   | 1,25 | A00016...                  | A00016...                   |                                 |                              |
| 1,7    | 0,35 | 40          | 8    | 11   | 2,5       | 2,1      | 2   | 1,35 | A00017...                  | A00017...                   |                                 |                              |
| 1,8    | 0,35 | 40          | 8    | 11   | 2,5       | 2,1      | 2   | 1,45 | A00018...                  | A00018...                   |                                 |                              |
| 2      | 0,4  | 45          | 7    | 11   | 2,8       | 2,1      | 3   | 1,6  | A00020...                  | A00020...                   |                                 |                              |
| 2,5    | 0,45 | 50          | 9    | 15   | 2,8       | 2,1      | 3   | 2,05 | A00025...                  | A00025...                   |                                 |                              |
| 3      | 0,5  | 56          | 10   | 18   | 3,5       | 2,7      | 3   | 2,5  | A00030...                  | A00030...                   |                                 |                              |
| 4      | 0,7  | 63          | 12   | 21   | 4,5       | 3,4      | 3   | 3,3  | A00040...                  | A00040...                   | A00040...                       |                              |
| 5      | 0,8  | 70          | 14   | 24,5 | 6         | 4,9      | 3   | 4,2  | A00050...                  | A00050...                   | A00050...                       | A00050...                    |
| 6      | 1    | 80          | 16   | 29   | 6         | 4,9      | 3   | 5    | A00060...                  | A00060...                   | A00060...                       | A00060...                    |
| 8      | 1,25 | 90          | 18   | 33   | 8         | 6,2      | 3   | 6,8  | A00080...                  | A00080...                   | A00080...                       | A00080...                    |
| 10     | 1,5  | 100         | 20   | 36   | 10        | 8        | 3   | 8,5  | A00100...                  | A00100...                   | A00100...                       | A00100...                    |
| 12     | 1,75 | 110         | 24   | -    | 9         | 7        | 4   | 10,2 | A00120...                  | A00120...                   | A00120...                       | A00120...                    |
| 14     | 2    | 110         | 25   | -    | 11        | 9        | 4   | 12   | A00140...                  | A00140...                   | A00140...                       | A00140...                    |
| 16     | 2    | 110         | 28   | -    | 12        | 9        | 4   | 14   | A00160...                  | A00160...                   | A00160...                       | A00160...                    |
| 18     | 2,5  | 125         | 32   | -    | 14        | 11       | 4   | 15,5 | A00180...                  | A00180...                   |                                 |                              |
| 20     | 2,5  | 140         | 32   | -    | 16        | 12       | 4   | 17,5 | A00200...                  | A00200...                   |                                 |                              |
| 24     | 3    | 160         | 36   | -    | 18        | 14,5     | 4   | 21   | A00240...                  | A00240...                   |                                 |                              |
| 27     | 3    | 160         | 36   | -    | 20        | 16       | 4   | 24   | A00270...                  | A00270...                   |                                 |                              |
| 30     | 3,5  | 180         | 40   | -    | 22        | 18       | 5   | 26,5 | A00300...                  | A00300...                   |                                 |                              |
| 33     | 3,5  | 180         | 40   | -    | 25        | 20       | 5   | 29,5 | A00330...                  | A00330...                   |                                 |                              |
| 36     | 4    | 200         | 55   | -    | 28        | 22       | 5   | 32   | A00360...                  | A00360...                   |                                 |                              |

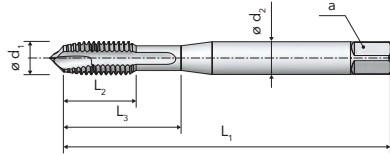
(\*) = Tolerance 5HX

HIGH PERFORMANCE MACHINE TAPS for through holes  
Straight flutes with spiral point / for stainless steel

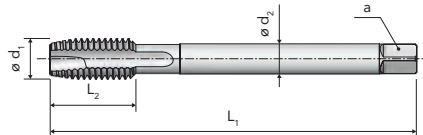


**P150**  
G-MAXX

**DIN 371**  
≤ M10



**DIN 376**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | P150<br>G-MAXX |  |  |  |
|-----|-----|----------------|--|--|--|
| P   | P.7 | • 15-20        |  |  |  |
| M   | M.1 | • 15-20        |  |  |  |
|     | M.2 | • 10-12        |  |  |  |

**6HX**



P SERIES

| Ød1        | P    | L1<br>js16 | L2   | L3   | Ød2<br>h9 | a<br>h12 | z   | Ød1<br>h9 | P150<br>G-MAXX<br>...1505A2AX0 |  |  |  |
|------------|------|------------|------|------|-----------|----------|-----|-----------|--------------------------------|--|--|--|
| [mm]       | [mm] | [mm]       | [mm] | [mm] | [mm]      | [mm]     | [-] | [mm]      |                                |  |  |  |
| <b>M 3</b> | 0,5  | 56         | 10   | 18   | 3,5       | 2,7      | 3   | 2,5       | A00030..                       |  |  |  |
| <b>4</b>   | 0,7  | 63         | 12   | 21   | 4,5       | 3,4      | 3   | 3,3       | A00040..                       |  |  |  |
| <b>5</b>   | 0,8  | 70         | 14   | 24,5 | 6         | 4,9      | 3   | 4,2       | A00050..                       |  |  |  |
| <b>6</b>   | 1    | 80         | 16   | 29   | 6         | 4,9      | 3   | 5         | A00060..                       |  |  |  |
| <b>8</b>   | 1,25 | 90         | 18   | 33   | 8         | 6,2      | 3   | 6,8       | A00080..                       |  |  |  |
| <b>10</b>  | 1,5  | 100        | 20   | 36   | 10        | 8        | 3   | 8,5       | A00100..                       |  |  |  |
| <b>12</b>  | 1,75 | 110        | 24   | -    | 9         | 7        | 3   | 10,2      | A00120..                       |  |  |  |
| <b>14</b>  | 2    | 110        | 25   | -    | 11        | 9        | 3   | 12        | A00140..                       |  |  |  |
| <b>16</b>  | 2    | 110        | 28   | -    | 12        | 9        | 3   | 14        | A00160..                       |  |  |  |
| <b>18</b>  | 2,5  | 125        | 32   | -    | 14        | 11       | 4   | 15,5      | A00180..                       |  |  |  |
| <b>20</b>  | 2,5  | 140        | 32   | -    | 16        | 12       | 4   | 17,5      | A00200..                       |  |  |  |



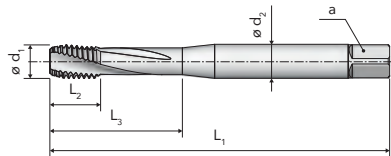
**P29**  
BRIGHT

**P29**  
TiN

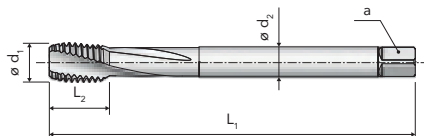
**P29**  
TiH1

**BP29**  
TiH1

**DIN 371**  
≤ M10



**DIN 376**  
≥ M12



**6HX**



**6HX**



**6HX**



**6HX**



#### APPLICATION RANGE - CUTTING SPEED m/min

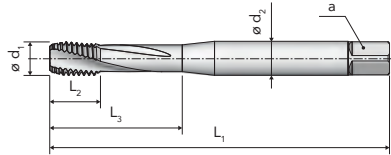
| ISO | MG  | P29<br>BRIGHT | P29<br>TiN | P29<br>TiH1 | BP29<br>TiH1 |
|-----|-----|---------------|------------|-------------|--------------|
| P   | P.3 | ● 15-18       | ● 25-30    | ● 25-30     | ● 25-30      |
|     | P.4 | ● 12-15       | ● 20-25    | ● 20-25     | ● 20-25      |
|     | P.5 | ● 8-10        | ● 10-15    | ● 10-15     | ● 10-15      |
|     | P.6 | ● 3-5         | ● 5-10     | ● 5-10      | ● 5-10       |
|     | P.7 | ● 8-10        | ● 10-15    | ● 10-15     | ● 10-15      |
| K   | K.2 | ● 15-18       | ● 25-30    | ● 25-30     | ● 25-30      |
| N   | N.3 | ● 15-18       | ● 25-30    | ● 25-30     | ● 25-30      |
|     | N.6 | ● 15-18       | ● 25-30    | ● 25-30     | ● 25-30      |
|     | N.7 | ● 12-15       | ● 20-25    | ● 20-25     | ● 20-25      |
| S   | S.2 | ● 2-3         |            | ● 2-3       | ● 2-3        |
|     | S.4 | ● 2-3         | ● 2-3      | ● 2-3       | ● 2-3        |

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | P29<br>BRIGHT<br>...0295A1AA0 | P29<br>TiN<br>...0295A1AD0 | P29<br>TiH1<br>...0295A1AH0 | BP29<br>TiH1<br>...0295M1AH0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|-------------------------------|----------------------------|-----------------------------|------------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                               |                            |                             |                              |
| <b>M 2</b>      | 0,4  | 45                      | 5              | 12             | 2,8                   | 2,1      | 3   | 1,6  | A00020...                     | A00020...                  | A00020...                   |                              |
| <b>2,5</b>      | 0,45 | 50                      | 6              | 15             | 2,8                   | 2,1      | 3   | 2,05 | A00025...                     | A00025...                  | A00025...                   |                              |
| <b>3</b>        | 0,5  | 56                      | 5              | 18             | 3,5                   | 2,7      | 3   | 2,5  | A00030...                     | A00030...                  | A00030...                   |                              |
| <b>4</b>        | 0,7  | 63                      | 7              | 21             | 4,5                   | 3,4      | 3   | 3,3  | A00040...                     | A00040...                  | A00040...                   |                              |
| <b>5</b>        | 0,8  | 70                      | 9              | 25             | 6                     | 4,9      | 3   | 4,2  | A00050...                     | A00050...                  | A00050...                   | A00050...                    |
| <b>6</b>        | 1    | 80                      | 11             | 30             | 6                     | 4,9      | 3   | 5    | A00060...                     | A00060...                  | A00060...                   | A00060...                    |
| <b>8</b>        | 1,25 | 90                      | 12             | 35             | 8                     | 6,2      | 3   | 6,8  | A00080...                     | A00080...                  | A00080...                   | A00080...                    |
| <b>10</b>       | 1,5  | 100                     | 13             | 39             | 10                    | 8        | 3   | 8,5  | A00100...                     | A00100...                  | A00100...                   | A00100...                    |
| <b>12</b>       | 1,75 | 110                     | 15             | -              | 9                     | 7        | 3   | 10,2 | A00120...                     | A00120...                  | A00120...                   | A00120...                    |
| <b>14</b>       | 2    | 110                     | 18             | -              | 11                    | 9        | 3   | 12   | A00140...                     | A00140...                  | A00140...                   | A00140...                    |
| <b>16</b>       | 2    | 110                     | 18             | -              | 12                    | 9        | 3   | 14   | A00160...                     | A00160...                  | A00160...                   | A00160...                    |
| <b>18</b>       | 2,5  | 125                     | 20             | -              | 14                    | 11       | 4   | 15,5 | A00180...                     | A00180...                  | A00180...                   | A00180...                    |
| <b>20</b>       | 2,5  | 140                     | 20             | -              | 16                    | 12       | 4   | 17,5 | A00200...                     | A00200...                  | A00200...                   | A00200...                    |
| <b>24</b>       | 3    | 160                     | 25             | -              | 18                    | 14,5     | 4   | 21   | A00240...                     | A00240...                  | A00240...                   |                              |
| <b>27</b>       | 3    | 160                     | 25             | -              | 20                    | 16       | 4   | 24   | A00270...                     | A00270...                  | A00270...                   |                              |
| <b>30</b>       | 3,5  | 180                     | 29             | -              | 22                    | 18       | 4   | 26,5 | A00300...                     | A00300...                  | A00300...                   |                              |
| <b>36</b>       | 4    | 200                     | 34             | -              | 28                    | 22       | 4   | 32   | A00360...                     | A00360...                  | A00360...                   |                              |
|                 |      |                         |                |                |                       |          |     |      |                               |                            |                             |                              |
|                 |      |                         |                |                |                       |          |     |      |                               |                            |                             |                              |
|                 |      |                         |                |                |                       |          |     |      |                               |                            |                             |                              |
|                 |      |                         |                |                |                       |          |     |      |                               |                            |                             |                              |
|                 |      |                         |                |                |                       |          |     |      |                               |                            |                             |                              |

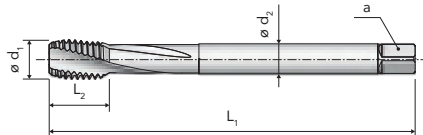


**P29 E**  
TiH1

**DIN 371**  
≤ M10



**DIN 376**  
≥ M12

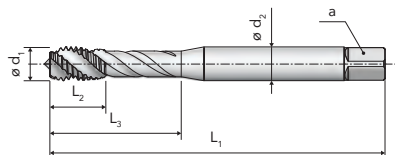
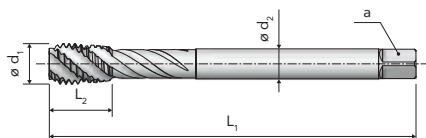


APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | P29 E<br>TIH1 |  |  |  |
|-----|-----|---------------|--|--|--|
| P   | P.3 | ● 25-30       |  |  |  |
|     | P.4 | ● 20-25       |  |  |  |
|     | P.5 | ● 10-15       |  |  |  |
|     | P.6 | ● 5-10        |  |  |  |
|     | P.7 | ● 10-15       |  |  |  |
| K   | K.2 | ● 25-30       |  |  |  |
| N   | N.3 | ● 25-30       |  |  |  |
|     | N.6 | ● 25-30       |  |  |  |
|     | N.7 | ● 20-25       |  |  |  |
| S   | S.2 | ● 2-3         |  |  |  |
|     | S.4 | ● 2-3         |  |  |  |

## 6HX

[illegible]

P70  
TiNP70  
TiH1P70 6GX  
TiH1P70 7GX  
TiH1DIN 371  
≤ M10DIN 376  
≥ M12

## APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | P70<br>TiN | P70<br>TiH1 | P70 6GX<br>TiH1 | P70 7GX<br>TiH1 |
|-----|-----|------------|-------------|-----------------|-----------------|
| P   | P.3 | ● 20-30    | ● 20-30     | ● 20-30         | ● 20-30         |
|     | P.4 | ● 15-25    | ● 15-25     | ● 15-25         | ● 15-25         |
|     | P.5 | ● 5-15     | ● 5-15      | ● 5-15          | ● 5-15          |
|     | P.7 | ● 8-10     | ● 8-10      | ● 8-10          | ● 8-10          |
| M   | M.1 | ● 8-10     | ● 8-10      | ● 8-10          | ● 8-10          |
|     | M.2 | ● 5-7      | ● 5-7       | ● 5-7           | ● 5-7           |
| K   | K.2 | ● 20-30    | ● 20-30     | ● 20-30         | ● 20-30         |
| N   | N.3 | ● 25-35    | ● 25-35     | ● 25-35         | ● 25-35         |
|     | N.6 | ● 25-35    | ● 25-35     | ● 25-35         | ● 25-35         |
| S   | S.1 |            | ● 10-15     | ● 10-15         | ● 10-15         |
|     | S.3 | ● 10-15    | ● 10-15     | ● 10-15         | ● 10-15         |

6HX



6HX



6GX



7GX



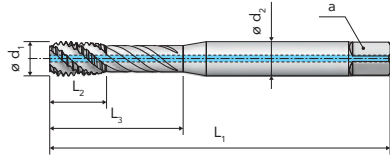
NEW

| Ød1  | P    | L1<br>js 16 | L2   | L3   | Ød2<br>h9 | a<br>h12 | z   |      | P70<br>TiN<br>...0704A1AD0 | P70<br>TiH1<br>...0704A1AH0 | P70 6GX<br>TiH1<br>...0704A1CH0 | P70 7GX<br>TiH1<br>...0704A1DH0 |
|------|------|-------------|------|------|-----------|----------|-----|------|----------------------------|-----------------------------|---------------------------------|---------------------------------|
| [mm] | [mm] | [mm]        | [mm] | [mm] | [mm]      | [mm]     | [-] | [mm] |                            |                             |                                 |                                 |
| M 2  | 0,4  | 45          | 6    | 12   | 2,8       | 2,1      | 3   | 1,6  | A00020...                  | A00020...                   |                                 |                                 |
| 2,5  | 0,45 | 50          | 6,5  | 15   | 2,8       | 2,1      | 3   | 2,05 | A00025...                  | A00025...                   |                                 |                                 |
| 3    | 0,5  | 56          | 7    | 15   | 3,5       | 2,7      | 3   | 2,5  | A00030...                  | A00030...                   | A00030...                       | A00030...                       |
| 4    | 0,7  | 63          | 8,5  | 21   | 4,5       | 3,4      | 3   | 3,3  | A00040...                  | A00040...                   | A00040...                       | A00040...                       |
| 5    | 0,8  | 70          | 10   | 24,5 | 6         | 4,9      | 3   | 4,2  | A00050...                  | A00050...                   | A00050...                       | A00050...                       |
| 6    | 1    | 80          | 12   | 29   | 6         | 4,9      | 3   | 5    | A00060...                  | A00060...                   | A00060...                       | A00060...                       |
| 8    | 1,25 | 90          | 14   | 33   | 8         | 6,2      | 3   | 6,8  | A00080...                  | A00080...                   | A00080...                       | A00080...                       |
| 10   | 1,5  | 100         | 17   | 39   | 10        | 8        | 3   | 8,5  | A00100...                  | A00100...                   | A00100...                       | A00100...                       |
| 12   | 1,75 | 110         | 18   | -    | 9         | 7        | 4   | 10,2 | A00120...                  | A00120...                   | A00120...                       | A00120...                       |
| 14   | 2    | 110         | 20,5 | -    | 11        | 9        | 4   | 12   | A00140...                  | A00140...                   | A00140...                       |                                 |
| 16   | 2    | 110         | 20,5 | -    | 12        | 9        | 4   | 14   | A00160...                  | A00160...                   | A00160...                       |                                 |
| 18   | 2,5  | 125         | 25,5 | -    | 14        | 11       | 4   | 15,5 | A00180...                  | A00180...                   | A00180...                       |                                 |
| 20   | 2,5  | 140         | 25,5 | -    | 16        | 12       | 4   | 17,5 | A00200...                  | A00200...                   | A00200...                       |                                 |
| 22   | 2,5  | 140         | 25,5 | -    | 18        | 14,5     | 4   | 19,5 | A00220...                  | A00220...                   |                                 |                                 |
| 24   | 3    | 160         | 32   | -    | 18        | 14,5     | 4   | 21   | A00240...                  | A00240...                   |                                 |                                 |
| 27   | 3    | 160         | 32   | -    | 20        | 16       | 5   | 24   | A00270...                  | A00270...                   |                                 |                                 |
| 30   | 3,5  | 180         | 37   | -    | 22        | 18       | 5   | 26,5 | A00300...                  | A00300...                   |                                 |                                 |
| 33   | 3,5  | 180         | 37   | -    | 25        | 20       | 5   | 29,5 | A00330...                  | A00330...                   |                                 |                                 |
| 36   | 4    | 200         | 42   | -    | 28        | 22       | 5   | 32   | A00360...                  | A00360...                   |                                 |                                 |
| 42   | 4,5  | 200         | 45   | -    | 32        | 24       | 5   | 37,5 | A00420...                  | A00420...                   |                                 |                                 |
|      |      |             |      |      |           |          |     |      |                            |                             |                                 |                                 |
|      |      |             |      |      |           |          |     |      |                            |                             |                                 |                                 |
|      |      |             |      |      |           |          |     |      |                            |                             |                                 |                                 |

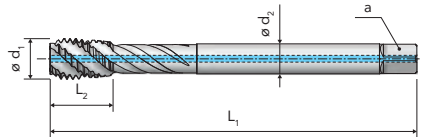


**BP70**  
TiH1

**DIN 371**  
≤ M10



**DIN 376**  
≥ M12



**6HX**



APPLICATION RANGE - CUTTING SPEED m/min

| ISO      | MG  | BP70<br>TiH1 |  |  |  |
|----------|-----|--------------|--|--|--|
| <b>P</b> | P.3 | • 20-30      |  |  |  |
|          | P.4 | • 15-25      |  |  |  |
|          | P.5 | • 5-15       |  |  |  |
|          | P.7 | • 8-10       |  |  |  |
| <b>M</b> | M.1 | • 8-10       |  |  |  |
|          | M.2 | • 5-7        |  |  |  |
| <b>K</b> | K.2 | • 20-30      |  |  |  |
| <b>N</b> | N.3 | • 25-35      |  |  |  |
|          | N.6 | • 25-35      |  |  |  |
| <b>S</b> | S.1 | • 10-15      |  |  |  |
|          | S.3 | • 10-15      |  |  |  |

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | BP70<br>TiH1<br>...0704M1AH0 |  |  |  |
|-----------------|------|------------------------|----------------|----------------|-----------------------|----------|-----|------|------------------------------|--|--|--|
| [mm]            | [mm] | [mm]                   | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                              |  |  |  |
| <b>M5</b>       | 0,8  | 70                     | 10             | 24,5           | 6                     | 4,9      | 3   | 4,2  | A00050...                    |  |  |  |
| <b>6</b>        | 1    | 80                     | 12             | 29             | 6                     | 4,9      | 3   | 5    | A00060...                    |  |  |  |
| <b>8</b>        | 1,25 | 90                     | 14             | 33             | 8                     | 6,2      | 3   | 6,8  | A00080...                    |  |  |  |
| <b>10</b>       | 1,5  | 100                    | 17             | 39             | 10                    | 8        | 3   | 8,5  | A00100...                    |  |  |  |
| <b>12</b>       | 1,75 | 110                    | 18             | -              | 9                     | 7        | 4   | 10,2 | A00120...                    |  |  |  |
| <b>14</b>       | 2    | 110                    | 20,5           | -              | 11                    | 9        | 4   | 12   | A00140...                    |  |  |  |
| <b>16</b>       | 2    | 110                    | 20,5           | -              | 12                    | 9        | 4   | 14   | A00160...                    |  |  |  |
| <b>20</b>       | 2,5  | 140                    | 25,5           | -              | 16                    | 12       | 4   | 17,5 | A00200...                    |  |  |  |
| <b>24</b>       | 3    | 160                    | 32             | -              | 18                    | 14,5     | 4   | 21   | A00240...                    |  |  |  |

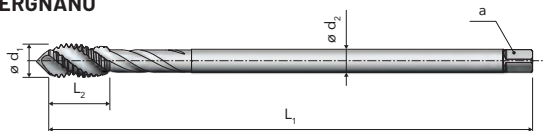


HIGH PERFORMANCE MACHINE TAPS for blind holes  
40° spiral flutes / back tapered / long and through shank



**P76 L**  
TiH1

## NORM VERGNANO



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | P76 L<br>TIH1 |  |  |  |
|-----|-----|---------------|--|--|--|
| P   | P.3 | ● 20-30       |  |  |  |
|     | P.4 | ● 15-25       |  |  |  |
|     | P.5 | ● 5-15        |  |  |  |
|     | P.7 | ● 8-10        |  |  |  |
| M   | M.1 | ● 8-10        |  |  |  |
|     | M.2 | ● 5-7         |  |  |  |
| K   | K.2 | ● 20-30       |  |  |  |
| N   | N.3 | ● 25-35       |  |  |  |
|     | N.6 | ● 25-35       |  |  |  |
| S   | S.1 | ● 10-15       |  |  |  |
|     | S.3 | ● 10-15       |  |  |  |

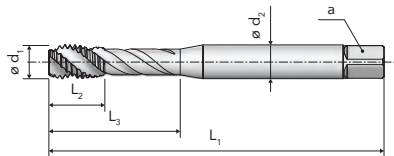
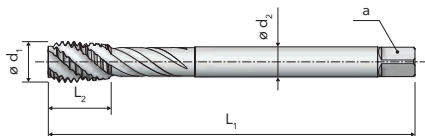
## 6HX

[illegible]


**P170**  
G-MAXX

**NEW**  
**P170 E**  
G-MAXX

**NEW**  
**BP170**  
G-MAXX

**DIN 371**  
≤ M10

**DIN 376**  
≥ M12


APPLICATION RANGE - CUTTING SPEED m/min

| ISO      | MG  | P170<br>G-MAXX | P170 E<br>G-MAXX | BP170 E<br>G-MAXX |
|----------|-----|----------------|------------------|-------------------|
| <b>P</b> | P.7 | ● 10-15        | ● 10-15          | ● 10-15           |
| <b>M</b> | M.1 | ● 10-15        | ● 10-15          | ● 10-15           |
|          | M.2 | ● 6-8          | ● 6-8            | ● 6-8             |

**6HX****6HX****6HX**

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z                |      | P170<br>G-MAXX<br>...1704A1AX0 | P170 E<br>G-MAXX<br>...1704A3AX0 | BP170<br>G-MAXX<br>...1704M1AX0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|------------------|------|--------------------------------|----------------------------------|---------------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-]              | [mm] |                                |                                  |                                 |
| <b>M 3</b>      | 0,5  | 56                      | 7              | 15             | 3,5                   | 2,7      | 3                | 2,5  | A00030..                       | A00030..                         |                                 |
| <b>4</b>        | 0,7  | 63                      | 8,5            | 21             | 4,5                   | 3,4      | 3                | 3,3  | A00040..                       | A00040..                         |                                 |
| <b>5</b>        | 0,8  | 70                      | 10             | 24,5           | 6                     | 4,9      | 3                | 4,2  | A00050..                       | A00050..                         | A00050..                        |
| <b>6</b>        | 1    | 80                      | 12             | 29             | 6                     | 4,9      | 3                | 5    | A00060..                       | A00060..                         | A00060..                        |
| <b>8</b>        | 1,25 | 90                      | 14             | 33             | 8                     | 6,2      | 3 <sup>(1)</sup> | 6,8  | A00080..                       | A00080..                         | A00080..                        |
| <b>10</b>       | 1,5  | 100                     | 17             | 39             | 10                    | 8        | 3 <sup>(1)</sup> | 8,5  | A00100..                       | A00100..                         | A00100..                        |
| <b>12</b>       | 1,75 | 110                     | 18             | -              | 9                     | 7        | 4                | 10,2 | A00120..                       | A00120..                         | A00120..                        |
| <b>14</b>       | 2    | 110                     | 20,5           | -              | 11                    | 9        | 4                | 12   | A00140..                       |                                  |                                 |
| <b>16</b>       | 2    | 110                     | 20,5           | -              | 12                    | 9        | 4 <sup>(2)</sup> | 14   | A00160..                       | A00160..                         | A00160..                        |
| <b>18</b>       | 2,5  | 125                     | 25,5           | -              | 14                    | 11       | 4                | 15,5 | A00180..                       |                                  |                                 |
| <b>20</b>       | 2,5  | 140                     | 25,5           | -              | 16                    | 12       | 4 <sup>(2)</sup> | 17,5 | A00200..                       | A00200..                         | A00200..                        |

(1): P170 E z= 4 / (2): P170 E z= 5

## HIGH PERFORMANCE COLD FORMING TAPS for blind and through holes Without oil grooves

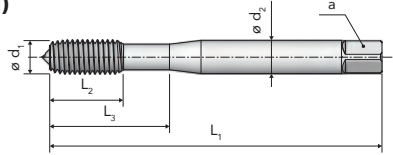


**NEW**  
**P80**  
V-MAXX

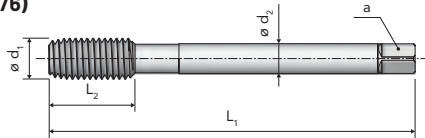
**NEW**  
**P80 6GX**  
V-MAXX

**NEW**  
**P80 7GX**  
V-MAXX

**DIN 2174 (371)**  
≤ M10



**DIN 2174 (376)**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P80<br>V-MAXX | P80 6GX<br>V-MAXX | P80 7GX<br>V-MAXX |  |
|-----|-------|---------------|-------------------|-------------------|--|
| P   | P.1-2 | ● 20-25       | ● 20-25           | ● 20-25           |  |
|     | P.3   | ● 15-20       | ● 15-20           | ● 15-20           |  |
| N   | N.1-2 | ● 20-25       | ● 20-25           | ● 20-25           |  |
|     | N.3   | ● 15-20       | ● 15-20           | ● 15-20           |  |
|     | N.5-6 | ● 20-25       | ● 20-25           | ● 20-25           |  |

6HX



6GX



1,5xD



**7GX**



1,5xD



**P** SERIES

[illegible]

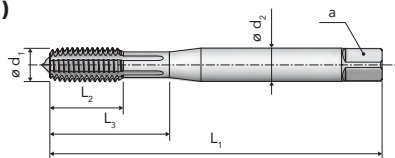


**NEW**  
**P80 N**  
V-MAXX

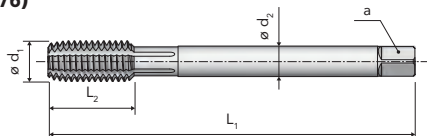
**NEW**  
**P80 N 6GX**  
V-MAXX

**NEW**  
**P80 N 7GX**  
V-MAXX

**DIN 2174 (371)**  
≤ M10



**DIN 2174 (376)**  
≥ M12



## 6HX

6GX

7GX



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P80 N<br>V-MAXX | P80 N 6GX<br>V-MAXX | P80 N 7GX<br>V-MAXX |  |
|-----|-------|-----------------|---------------------|---------------------|--|
| P   | P.1-2 | ● 20-25         | ● 20-25             | ● 20-25             |  |
|     | P.3   | ● 15-20         | ● 15-20             | ● 15-20             |  |
| N   | N.1-2 | ● 20-25         | ● 20-25             | ● 20-25             |  |
|     | N.3   | ● 15-20         | ● 15-20             | ● 15-20             |  |
|     | N.5-6 | ● 20-25         | ● 20-25             | ● 20-25             |  |

[illegible]

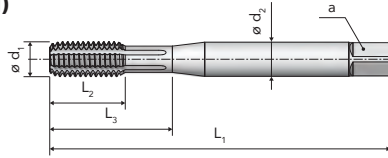


NEW  
P80 E  
V-MAXX

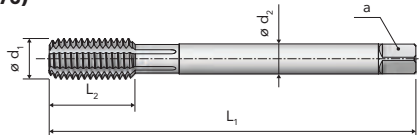
NEW  
P80 NE  
V-MAXX

NEW  
P80 NE 6GX  
V-MAXX

DIN 2174 (371)  
≤ M10



DIN 2174 (376)  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P80 E<br>V-MAXX | P80 NE<br>V-MAXX | P80 NE 6GX<br>V-MAXX |
|-----|-------|-----------------|------------------|----------------------|
| P   | P.1-2 | • 20-25         | • 20-25          | • 20-25              |
|     | P.3   | • 15-20         | • 15-20          | • 15-20              |
| N   | N.1-2 | • 20-25         | • 20-25          | • 20-25              |
|     | N.3   | • 15-20         | • 15-20          | • 15-20              |
|     | N.5-6 | • 20-25         | • 20-25          | • 20-25              |

6HX



6HX



6GX



P SERIES

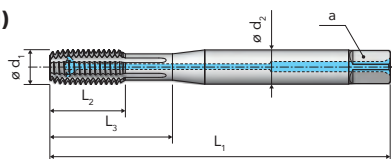
| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | P80 E<br>V-MAXX<br>...0808A3AV0 | P80 NE<br>V-MAXX<br>...0808G3AV0 | P80 NE 6GX<br>V-MAXX<br>...0808G3CV0 |
|-----------------|------|------------------------|----------------|----------------|-----------------------|----------|-----|------|---------------------------------|----------------------------------|--------------------------------------|
| [mm]            | [mm] | [mm]                   | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                 |                                  |                                      |
| M 3             | 0,5  | 56                     | 10             | 18             | 3,5                   | 2,7      | 4   | 2,8  | A00030..                        | A00030..                         | A00030..                             |
| 3,5             | 0,6  | 56                     | 11             | 20             | 4                     | 3        | 4   | 3,25 |                                 | A00035..                         |                                      |
| 4               | 0,7  | 63                     | 12             | 21             | 4,5                   | 3,4      | 5   | 3,7  | A00040...                       | A00040...                        | A00040...                            |
| 5               | 0,8  | 70                     | 14             | 24,5           | 6                     | 4,9      | 5   | 4,65 | A00050...                       | A00050...                        | A00050...                            |
| 6               | 1    | 80                     | 16             | 29             | 6                     | 4,9      | 5   | 5,55 | A00060...                       | A00060...                        | A00060...                            |
| 8               | 1,25 | 90                     | 18             | 33             | 8                     | 6,2      | 5   | 7,4  | A00080...                       | A00080...                        | A00080...                            |
| 10              | 1,5  | 100                    | 20             | 36             | 10                    | 8        | 5   | 9,3  | A00100...                       | A00100...                        | A00100...                            |
| 12              | 1,75 | 110                    | 24             | -              | 9                     | 7        | 5   | 11,2 |                                 | A00120...                        |                                      |
| 16              | 2    | 110                    | 28             | -              | 12                    | 9        | 6   | 15,1 |                                 | A00160...                        |                                      |



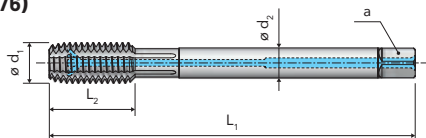
**NEW**  
**BP80 N R**  
V-MAXX

**NEW**  
**BP80 NE**  
V-MAXX

**DIN 2174 (371)**  
≤ M10



**DIN 2174 (376)**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | BP80 N R<br>V-MAXX | BP80 NE<br>V-MAXX |  |  |
|-----|-------|--------------------|-------------------|--|--|
| P   | P.1-2 | ● 20-25            | ● 20-25           |  |  |
|     | P.3   | ● 15-20            | ● 15-20           |  |  |
| N   | N.1-2 | ● 20-25            | ● 20-25           |  |  |
|     | N.3   | ● 15-20            | ● 15-20           |  |  |
|     | N.5-6 | ● 20-25            | ● 20-25           |  |  |

6HX

6HX

[illegible]



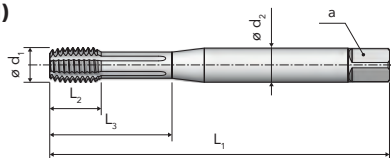
**NEW**  
**P900 N**  
V-MAXX

**P900 N**  
RED-MAXX

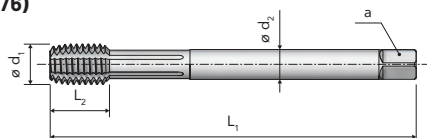
**P900 N 6GX**  
RED-MAXX

**P900 N 7GX**  
RED-MAXX

**DIN 2174 (371)**  
≤ M10



**DIN 2174 (376)**  
≥ M12



**p** SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P900 N<br>V-MAXX | P900 N<br>RED-MAXX | P900 N 6GX<br>RED-MAXX | P900 N 7GX<br>RED-MAXX |
|-----|-------|------------------|--------------------|------------------------|------------------------|
| P   | P.1-2 | ● 40-45          | ● 40-45            | ● 40-45                | ● 40-45                |
|     | P.3   | ● 35-40          | ● 35-40            | ● 35-40                | ● 35-40                |
|     | P.4   | ● 30-35          | ● 30-35            | ● 30-35                | ● 30-35                |
|     | P.5   | ● 15-20          | ● 15-20            | ● 15-20                | ● 15-20                |
|     | P.7   | ● 10-15          |                    |                        |                        |
| M   | M.1   | ● 10-15          |                    |                        |                        |
| N   | N.1-2 | ● 40-45          | ● 40-45            | ● 40-45                | ● 40-45                |
|     | N.3   | ● 35-40          | ● 35-40            | ● 35-40                | ● 35-40                |
|     | N.5-6 | ● 40-45          | ● 40-45            | ● 40-45                | ● 40-45                |
| S   | S.3   | ● 10-15          | ● 10-15            | ● 10-15                | ● 10-15                |

6HX



6HX



6GX



7GX

[illegible]



HSSZ

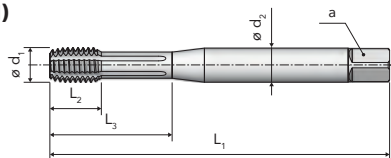


**NEW**  
**P900 NE**  
V-MAXX

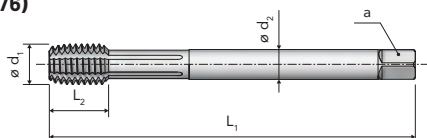
**P900 NE**  
RED-MAXX

**P900 NE 6GX**  
RED-MAXX

**DIN 2174 (371)**  
≤ M10



**DIN 2174 (376)**  
≥ M12



6HX

## 6HX

6GX



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P900 NE<br>V-MAXX | P900 NE<br>RED-MAXX | P900NE 6GX<br>RED-MAXX |  |
|-----|-------|-------------------|---------------------|------------------------|--|
| P   | P.1-2 | ● 40-45           | ● 40-45             | ● 40-45                |  |
|     | P.3   | ● 35-40           | ● 35-40             | ● 35-40                |  |
|     | P.4   | ● 30-35           | ● 30-35             | ● 30-35                |  |
|     | P.5   | ● 15-20           | ● 15-20             | ● 15-20                |  |
|     | P.7   | ● 10-15           |                     |                        |  |
| M   | M.1   | ● 10-15           |                     |                        |  |
| N   | N.1-2 | ● 40-45           | ● 40-45             | ● 40-45                |  |
|     | N.3   | ● 35-40           | ● 35-40             | ● 35-40                |  |
|     | N.5-6 | ● 40-45           | ● 40-45             | ● 40-45                |  |
| S   | S.3   | ● 10-15           | ● 10-15             | ● 10-15                |  |

[illegible]

# HIGH PERFORMANCE COLD FORMING TAPS for blind and through holes With oil grooves / internal coolant

**DIN 13**



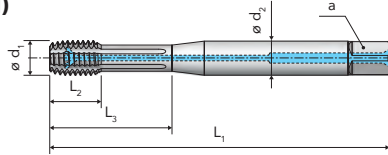
**BP900 N R**  
RED-MAXX

**BP900 N RE**  
RED-MAXX

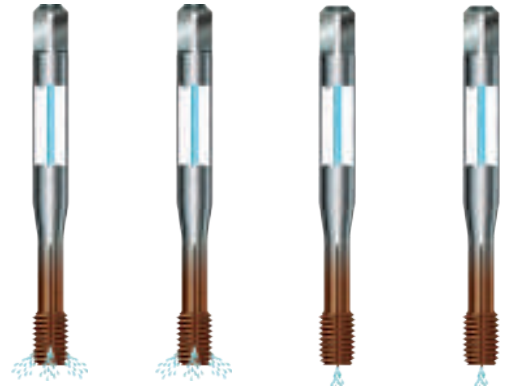
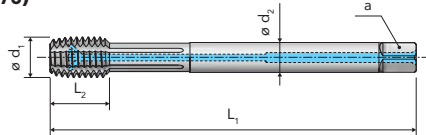
**BP900 N**  
RED-MAXX

**NEW**  
**BP900 NE**  
RED-MAXX

**DIN 2174 (371)**  
≤ M10



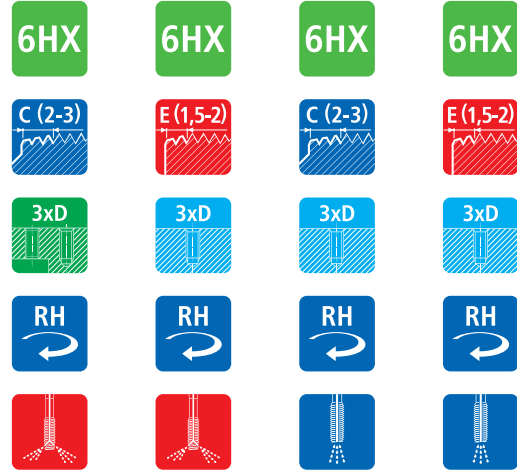
**DIN 2174 (376)**  
≥ M12



**P** SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO      | MG    | BP900 N R<br>RED-MAXX | BP900 N RE<br>RED-MAXX | BP900 N<br>RED-MAXX | BP900 NE<br>RED-MAXX |
|----------|-------|-----------------------|------------------------|---------------------|----------------------|
| <b>P</b> | P.1-2 | ● 40-45               | ● 40-45                | ● 40-45             | ● 40-45              |
|          | P.3   | ● 35-40               | ● 35-40                | ● 35-40             | ● 35-40              |
|          | P.4   | ● 30-35               | ● 30-35                | ● 30-35             | ● 30-35              |
|          | P.5   | ● 15-20               | ● 15-20                | ● 15-20             | ● 15-20              |
| <b>N</b> | N.1-2 | ● 40-45               | ● 40-45                | ● 40-45             | ● 40-45              |
|          | N.3   | ● 35-40               | ● 35-40                | ● 35-40             | ● 35-40              |
|          | N.5-6 | ● 40-45               | ● 40-45                | ● 40-45             | ● 40-45              |
| <b>S</b> | S.3   | ● 10-15               | ● 10-15                | ● 10-15             | ● 10-15              |



| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |       | BP900 N R<br>RED-MAXX<br>...9008R1AR0 | BP900 N RE<br>RED-MAXX<br>...9008R3AR0 | BP900 N<br>RED-MAXX<br>...9008Q1AR0 | BP900 NE<br>RED-MAXX<br>...9008Q3AR0 |
|-----------------|------|------------------------|----------------|----------------|-----------------------|----------|-----|-------|---------------------------------------|----------------------------------------|-------------------------------------|--------------------------------------|
| [mm]            | [mm] | [mm]                   | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm]  |                                       |                                        |                                     |                                      |
| <b>M5</b>       | 0,8  | 70                     | 8              | 25             | 6                     | 4,9      | 5   | 4,65  | A00050...                             | A00050...                              | A00050...                           | A00050...                            |
| <b>6</b>        | 1    | 80                     | 10             | 29             | 6                     | 4,9      | 5   | 5,6   | A00060...                             | A00060...                              | A00060...                           | A00060...                            |
| <b>8</b>        | 1,25 | 90                     | 13             | 35             | 8                     | 6,2      | 5   | 7,45  | A00080...                             | A00080...                              | A00080...                           | A00080...                            |
| <b>10</b>       | 1,5  | 100                    | 15             | 36             | 10                    | 8        | 6   | 9,35  | A00100...                             | A00100...                              | A00100...                           | A00100...                            |
| <b>12</b>       | 1,75 | 110                    | 18             | -              | 9                     | 7        | 8   | 11,25 | A00120...                             | A00120...                              | A00120...                           | A00120...                            |
| <b>16</b>       | 2    | 110                    | 20             | -              | 12                    | 9        | 8   | 15,1  | A00160...                             | A00160...                              | A00160...                           | A00160...                            |
| <b>20</b>       | 2,5  | 140                    | 25             | -              | 16                    | 12       | 8   | 18,9  | A00200...                             | A00200...                              | A00200...                           | A00200...                            |
| <b>24</b>       | 3    | 160                    | 30             | -              | 18                    | 14,5     | 8   | 22,7  | A00240...                             |                                        |                                     |                                      |
| <b>27</b>       | 3    | 160                    | 30             | -              | 20                    | 16       | 8   | 25,7  | A00270...                             |                                        |                                     |                                      |
| <b>30</b>       | 3,5  | 180                    | 35             | -              | 22                    | 18       | 8   | 28,45 | A00300...                             |                                        |                                     |                                      |

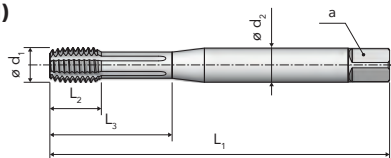


HSSZ

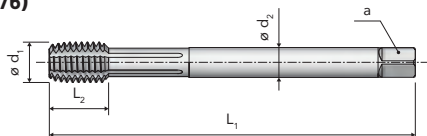


**P900 N LH**  
RED-MAXX

**DIN 2174 (371)**  
≤ M10



**DIN 2174 (376)**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P900 N LH<br>RED-MAXX |  |  |  |
|-----|-------|-----------------------|--|--|--|
| P   | P.1-2 | ● 40-45               |  |  |  |
|     | P.3   | ● 35-40               |  |  |  |
|     | P.4   | ● 30-35               |  |  |  |
|     | P.5   | ● 15-20               |  |  |  |
| N   | N.1-2 | ● 40-45               |  |  |  |
|     | N.3   | ● 35-40               |  |  |  |
|     | N.5-6 | ● 40-45               |  |  |  |
| S   | S.3   | ● 10-15               |  |  |  |

6HX



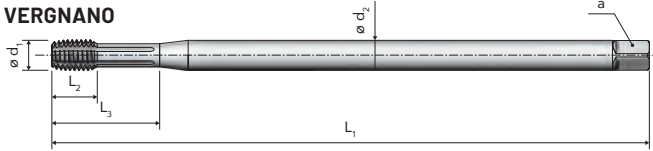
| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |  | P900 N LH<br>RED-MAXX<br>...9008S1AR0 |  |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|---------------------------------------------------------------------------------------|---------------------------------------|--|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm]                                                                                  |                                       |  |  |  |
| M 2             | 0,4  | 45                      | 4              | 11             | 2,8                   | 2,1      | 3   | 1,85                                                                                  | A00020...                             |  |  |  |
| 3               | 0,5  | 56                      | 5              | 17             | 3,5                   | 2,7      | 4   | 2,8                                                                                   | A00030...                             |  |  |  |
| 4               | 0,7  | 63                      | 7              | 21             | 4,5                   | 3,4      | 5   | 3,7                                                                                   | A00040...                             |  |  |  |
| 5               | 0,8  | 70                      | 8              | 25             | 6                     | 4,9      | 5   | 4,65                                                                                  | A00050...                             |  |  |  |
| 6               | 1    | 80                      | 10             | 29             | 6                     | 4,9      | 5   | 5,6                                                                                   | A00060...                             |  |  |  |
| 8               | 1,25 | 90                      | 13             | 35             | 8                     | 6,2      | 5   | 7,45                                                                                  | A00080...                             |  |  |  |
| 10              | 1,5  | 100                     | 15             | 39             | 10                    | 8        | 6   | 9,35                                                                                  | A00100...                             |  |  |  |
| 12              | 1,75 | 110                     | 18             | -              | 9                     | 7        | 8   | 11,25                                                                                 | A00120...                             |  |  |  |
| 16              | 2    | 110                     | 20             | -              | 12                    | 9        | 8   | 15,1                                                                                  | A00160...                             |  |  |  |

HIGH PERFORMANCE COLD FORMING TAPS for blind and through holes  
With oil grooves / long and reinforced shank

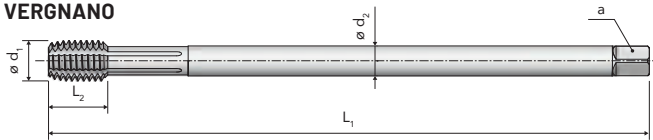


**P900 N L**  
RED-MAXX

## NORM VERGNANO

 $\leq M10$ 

## NORM VERGNANO

 $\geq M12$ 

APPLICATION RANGE - CUTTING SPEED m/min

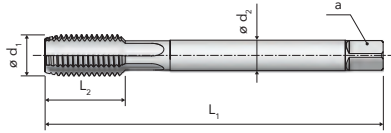
| ISO | MG    | P900 N L<br>RED-MAXX |  |  |  |
|-----|-------|----------------------|--|--|--|
| P   | P.1-2 | ● 40-45              |  |  |  |
|     | P.3   | ● 35-40              |  |  |  |
|     | P.4   | ● 30-35              |  |  |  |
|     | P.5   | ● 15-20              |  |  |  |
| N   | N.1-2 | ● 40-45              |  |  |  |
|     | N.3   | ● 35-40              |  |  |  |
|     | N.5-6 | ● 40-45              |  |  |  |
| S   | S.3   | ● 10-15              |  |  |  |

6HX



**P45**  
V-MAXX**BP45**  
V-MAXX**P45 E**  
V-MAXX**BP45 E**  
V-MAXX

DIN 374



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG     | P45<br>V-MAXX | BP45<br>V-MAXX | P45 E<br>V-MAXX | BP45 E<br>V-MAXX |
|-----|--------|---------------|----------------|-----------------|------------------|
| K   | K.1    | ● 40-50       | ● 40-50        | ● 40-50         | ● 40-50          |
| N   | N.4    | ● 40-50       | ● 40-50        | ● 40-50         | ● 40-50          |
|     | N.7    | ● 40-50       | ● 40-50        | ● 40-50         | ● 40-50          |
|     | N.9-10 | ● 45-55       | ● 45-55        | ● 45-55         | ● 45-55          |

**6HX****6HX****6HX****6HX**

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | P45<br>V-MAXX<br>...0455A1AV0 | BP45<br>V-MAXX<br>...0455M1AV0 | P45 E<br>V-MAXX<br>...0455A3AV0 | BP45 E<br>V-MAXX<br>...0455M3AV0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|-------------------------------|--------------------------------|---------------------------------|----------------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                               |                                |                                 |                                  |
| <b>M 8</b>      | 1    | 90                      | 16             | -              | 6                     | 4,9      | 4   | 7    | A08100...                     | A08100...                      | A08100...                       | A08100...                        |
| <b>10</b>       | 1    | 90                      | 18             | -              | 7                     | 5,5      | 4   | 9    | A10100...                     | A10100...                      | A10100...                       | A10100...                        |
| <b>10</b>       | 1,25 | 100                     | 18             | -              | 7                     | 5,5      | 4   | 8,8  | A10125...                     | A10125...                      | A10125...                       | A10125...                        |
| <b>12</b>       | 1,25 | 100                     | 22             | -              | 9                     | 7        | 4   | 10,8 | A12125...                     | A12125...                      | A12125...                       | A12125...                        |
| <b>12</b>       | 1,5  | 100                     | 22             | -              | 9                     | 7        | 4   | 10,5 | A12150...                     | A12150...                      | A12150...                       | A12150...                        |
| <b>14</b>       | 1,25 | 100                     | 22             | -              | 11                    | 9        | 4   | 12,8 | A14125...                     | A14125...                      |                                 |                                  |
| <b>14</b>       | 1,5  | 100                     | 22             | -              | 11                    | 9        | 4   | 12,5 | A14150...                     | A14150...                      | A14150...                       | A14150...                        |
| <b>16</b>       | 1,5  | 100                     | 22             | -              | 12                    | 9        | 4   | 14,5 | A16150...                     | A16150...                      | A16150...                       | A16150...                        |
| <b>20</b>       | 1,5  | 125                     | 25             | -              | 16                    | 12       | 4   | 18,5 | A20150...                     | A20150...                      |                                 |                                  |

### HIGH PERFORMANCE MACHINE TAPS for through holes

Straight flutes with spiral point



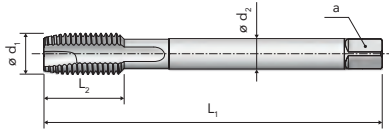
**P17**  
TiN

**P17**  
TiH1

**P17 6GX**  
TiH1

**BP17**  
TiH1

DIN 374



P SERIES

#### APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P17<br>TiN | P17<br>TiH1 | P17 6GX<br>TiH1 | BP17<br>TiH1 |
|-----|-------|------------|-------------|-----------------|--------------|
| P   | P.3   | • 25-35    | • 25-35     | • 25-35         | • 25-35      |
|     | P.4   | • 20-30    | • 20-30     | • 20-30         | • 20-30      |
|     | P.5   | • 10-20    | • 10-20     | • 10-20         | • 10-20      |
|     | P.6   | • 8-10     | • 8-10      | • 8-10          | • 8-10       |
|     | P.7   | • 10-15    | • 10-15     | • 10-15         | • 10-15      |
| M   | M.1   | • 10-15    | • 10-15     | • 10-15         | • 10-15      |
|     | M.2   | • 6-8      | • 6-8       | • 6-8           | • 6-8        |
| K   | K.2   | • 25-35    | • 25-35     | • 25-35         | • 25-35      |
| N   | N.2-3 | • 30-40    | • 30-40     | • 30-40         | • 30-40      |
|     | N.6   | • 25-35    | • 25-35     | • 25-35         | • 25-35      |

6HX



6HX



6GX



6HX



| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | P17<br>TiN<br>...0174A2AD0 | P17<br>TiH1<br>...0174A2AH0 | P17 6GX<br>TiH1<br>...0174A2CH0 | BP17<br>TiH1<br>...0174M2AH0 |
|-----------------|------|------------------------|----------------|----------------|-----------------------|----------|-----|------|----------------------------|-----------------------------|---------------------------------|------------------------------|
| [mm]            | [mm] | [mm]                   | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                            |                             |                                 |                              |
| <b>M 8</b>      | 1    | 90                     | 16             | -              | 6                     | 4,9      | 3   | 7    | A08100...                  | A08100...                   | A08100...                       | A08100...                    |
| <b>10</b>       | 1    | 90                     | 18             | -              | 7                     | 5,5      | 3   | 9    | A10100...                  | A10100...                   | A10100...                       | A10100...                    |
| <b>10</b>       | 1,25 | 100                    | 18             | -              | 7                     | 5,5      | 3   | 8,8  | A10125...                  | A10125...                   | A10125...                       | A10125...                    |
| <b>12</b>       | 1    | 100                    | 22             | -              | 9                     | 7        | 4   | 11   | A12100...                  | A12100...                   | A12100...                       | A12100...                    |
| <b>12</b>       | 1,25 | 100                    | 22             | -              | 9                     | 7        | 4   | 10,8 | A12125...                  | A12125...                   | A12125...                       | A12125...                    |
| <b>12</b>       | 1,5  | 100                    | 22             | -              | 9                     | 7        | 4   | 10,5 | A12150...                  | A12150...                   | A12150...                       | A12150...                    |
| <b>14</b>       | 1,5  | 100                    | 22             | -              | 11                    | 9        | 4   | 12,5 | A14150...                  | A14150...                   | A14150...                       | A14150...                    |
| <b>16</b>       | 1,5  | 100                    | 22             | -              | 12                    | 9        | 4   | 14,5 | A16150...                  | A16150...                   | A16150...                       | A16150...                    |
| <b>18</b>       | 1,5  | 110                    | 25             | -              | 14                    | 11       | 4   | 16,5 | A18150...                  | A18150...                   | A18150...                       | A18150...                    |
| <b>20</b>       | 1,5  | 125                    | 25             | -              | 16                    | 12       | 4   | 18,5 | A20150...                  | A20150...                   | A20150...                       | A20150...                    |



HIGH PERFORMANCE MACHINE TAPS for blind holes  
15° spiral flutes



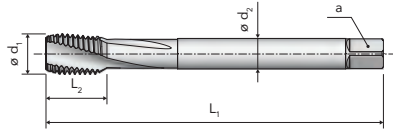
**P30**  
BRIGHT

**P30**  
TiN

**P30**  
TiH1

**BP30**  
TiH1

DIN 374



P SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | P30<br>BRIGHT | P30<br>TiN | P30<br>TiH1 | BP30<br>TiH1 |
|-----|-----|---------------|------------|-------------|--------------|
| P   | P.3 | • 15-18       | • 25-30    | • 25-30     | • 25-30      |
|     | P.4 | • 12-15       | • 20-25    | • 20-25     | • 20-25      |
|     | P.5 | • 8-10        | • 10-15    | • 10-15     | • 10-15      |
|     | P.6 | • 3-5         | • 5-10     | • 5-10      | • 5-10       |
|     | P.7 | • 8-10        | • 10-15    | • 10-15     | • 10-15      |
| K   | K.2 | • 15-18       | • 25-30    | • 25-30     | • 25-30      |
| N   | N.3 | • 15-18       | • 25-30    | • 25-30     | • 25-30      |
|     | N.6 | • 15-18       | • 25-30    | • 25-30     | • 25-30      |
|     | N.7 | • 12-15       | • 20-25    | • 20-25     | • 20-25      |
| S   | S.2 | • 2-3         |            | • 2-3       | • 2-3        |
|     | S.4 | • 2-3         | • 2-3      | • 2-3       | • 2-3        |

6HX



6HX



6HX



6HX

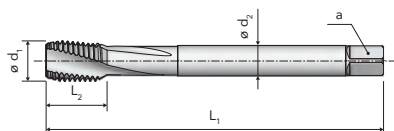


| $\varnothing d_1$ | P    | $L_1$<br>js16 | $L_2$ | $L_3$ | $\varnothing d_2$<br>h9 | a<br>h12 | z   |      | P30<br>BRIGHT<br>...0305A1AA0 | P30<br>TiN<br>...0305A1AD0 | P30<br>TiH1<br>...0305A1AH0 | BP30<br>TiH1<br>...0305M1AH0 |
|-------------------|------|---------------|-------|-------|-------------------------|----------|-----|------|-------------------------------|----------------------------|-----------------------------|------------------------------|
| [mm]              | [mm] | [mm]          | [mm]  | [mm]  | [mm]                    | [mm]     | [-] | [mm] |                               |                            |                             |                              |
| M 8               | 1    | 90            | 10    | -     | 6                       | 4,9      | 3   | 7    | A08100...                     | A08100...                  | A08100...                   |                              |
| 10                | 1    | 90            | 11    | -     | 7                       | 5,5      | 3   | 9    | A10100...                     | A10100...                  | A10100...                   |                              |
| 10                | 1,25 | 100           | 12    | -     | 7                       | 5,5      | 3   | 8,8  | A10125...                     | A10125...                  | A10125...                   | A10125...                    |
| 12                | 1,25 | 100           | 14    | -     | 9                       | 7        | 3   | 10,8 | A12125...                     | A12125...                  | A12125...                   | A12125...                    |
| 12                | 1,5  | 100           | 15    | -     | 9                       | 7        | 3   | 10,5 | A12150...                     | A12150...                  | A12150...                   | A12150...                    |
| 14                | 1,5  | 100           | 16    | -     | 11                      | 9        | 3   | 12,5 | A14150...                     | A14150...                  | A14150...                   | A14150...                    |
| 16                | 1,5  | 100           | 16    | -     | 12                      | 9        | 3   | 14,5 | A16150...                     | A16150...                  | A16150...                   | A16150...                    |
| 18                | 1,5  | 110           | 18    | -     | 14                      | 11       | 4   | 16,5 | A18150...                     | A18150...                  | A18150...                   | A18150...                    |
| 20                | 1,5  | 125           | 18    | -     | 16                      | 12       | 4   | 18,5 | A20150...                     | A20150...                  | A20150...                   | A20150...                    |



P30 E  
TiH1

DIN 374



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | P30 E<br>TIH1 |  |  |  |
|-----|-----|---------------|--|--|--|
| P   | P.3 | ● 25-30       |  |  |  |
|     | P.4 | ● 20-25       |  |  |  |
|     | P.5 | ● 10-15       |  |  |  |
|     | P.6 | ● 5-10        |  |  |  |
|     | P.7 | ● 10-15       |  |  |  |
| K   | K.2 | ● 25-30       |  |  |  |
| N   | N.3 | ● 25-30       |  |  |  |
|     | N.6 | ● 25-30       |  |  |  |
|     | N.7 | ● 20-25       |  |  |  |
| S   | S.2 | ● 2-3         |  |  |  |
|     | S.4 | ● 2-3         |  |  |  |

6HX

[illegible]

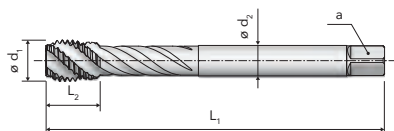




**P71 E**  
TiH1

**NEW**  
**P71 E 6GX**  
TiH1

DIN 374



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | P71E<br>TIH1 | P71E 66X<br>TIH1 |  |  |
|-----|-----|--------------|------------------|--|--|
| P   | P.3 | ● 20-30      | ● 20-30          |  |  |
|     | P.4 | ● 15-25      | ● 15-25          |  |  |
|     | P.5 | ● 5-15       | ● 5-15           |  |  |
|     | P.7 | ● 8-10       | ● 8-10           |  |  |
| M   | M.1 | ● 8-10       | ● 8-10           |  |  |
|     | M.2 | ● 5-7        | ● 5-7            |  |  |
| K   | K.2 | ● 20-30      | ● 20-30          |  |  |
| N   | N.3 | ● 25-35      | ● 25-35          |  |  |
|     | N.6 | ● 25-35      | ● 25-35          |  |  |
| S   | S.1 | ● 10-15      | ● 10-15          |  |  |
|     | S.3 | ● 10-15      | ● 10-15          |  |  |

## 6HX

6GX

[illegible]

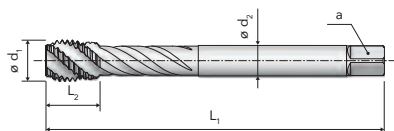
HIGH PERFORMANCE MACHINE TAPS for blind holes  
45° spiral flutes / back tapered / for stainless steel



**NEW**  
**P171**  
G-MAXX

G-MAXX

DIN 374



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | P171<br>G-MAXX |  |  |  |
|-----|-----|----------------|--|--|--|
| P   | P.7 | ● 10-15        |  |  |  |
| M   | M.1 | ● 10-15        |  |  |  |
|     | M.2 | ● 6-8          |  |  |  |

6HX

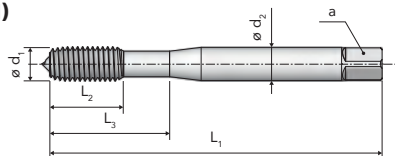
[illegible]



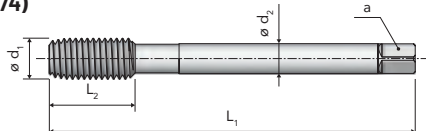
**NEW**  
**P81**  
V-MAXX

**NEW**  
**P81 6GX**  
V-MAXX

**DIN 2174 (371)**  
≤ M10x1,25



**DIN 2174 (374)**  
≥ M12x1



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P81<br>V-MAXX | P81 6GX<br>V-MAXX |  |  |
|-----|-------|---------------|-------------------|--|--|
| P   | P.1-2 | ● 20-25       | ● 20-25           |  |  |
|     | P.3   | ● 15-20       | ● 15-20           |  |  |
| N   | N.1-2 | ● 20-25       | ● 20-25           |  |  |
|     | N.3   | ● 15-20       | ● 15-20           |  |  |
|     | N.5-6 | ● 20-25       | ● 20-25           |  |  |

6HX

6GX

[illegible]

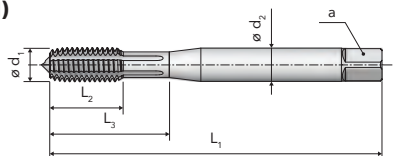
## HIGH PERFORMANCE COLD FORMING TAPS for blind and through holes



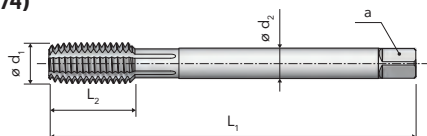
**NEW**  
**P81 N**  
V-MAXX

**NEW**  
**P81 N 6GX**  
V-MAXX

**DIN 2174 (371)**  
≤ M10x1,25



**DIN 2174 (374)**  
≥ M12x1



**p** SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P81N<br>V-MAXX | P81N 66X<br>V-MAXX |  |  |
|-----|-------|----------------|--------------------|--|--|
| P   | P.1-2 | ● 20-25        | ● 20-25            |  |  |
|     | P.3   | ● 15-20        | ● 15-20            |  |  |
| N   | N.1-2 | ● 20-25        | ● 20-25            |  |  |
|     | N.3   | ● 15-20        | ● 15-20            |  |  |
|     | N.5-6 | ● 20-25        | ● 20-25            |  |  |

6HX

6GX

[illegible]



HSSZ

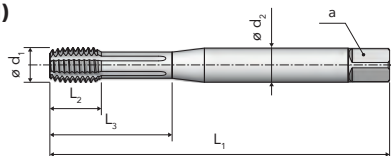


**NEW**  
**P901 N**  
V-MAXX

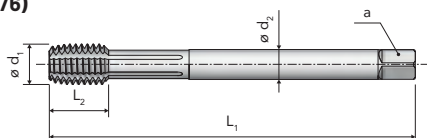
**P901 N**  
RFD-MAXX

**P901 N 6GX**  
RED-MAXX

**DIN 2174 (371)**  
≤ M10x1



**DIN 2174 (376)**  
≥ M12x1



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P901 N<br>V-MAXX | P901 N<br>RED-MAXX | P901 N 6GX<br>RED-MAXX |  |
|-----|-------|------------------|--------------------|------------------------|--|
| P   | P.1-2 | ● 40-45          | ● 40-45            | ● 40-45                |  |
|     | P.3   | ● 35-40          | ● 35-40            | ● 35-40                |  |
|     | P.4   | ● 30-35          | ● 30-35            | ● 30-35                |  |
|     | P.5   | ● 15-20          | ● 15-20            | ● 15-20                |  |
|     | P.7   | ● 10-15          |                    |                        |  |
| M   | M.1   | ● 10-15          |                    |                        |  |
| N   | N.1-2 | ● 40-45          | ● 40-45            | ● 40-45                |  |
|     | N.3   | ● 35-40          | ● 35-40            | ● 35-40                |  |
|     | N.5-6 | ● 40-45          | ● 40-45            | ● 40-45                |  |
| S   | S.3   | ● 10-15          | ● 10-15            | ● 10-15                |  |

6HX



6HX



6GX

[illegible]

## HIGH PERFORMANCE MACHINE TAPS for blind holes



HSSZ

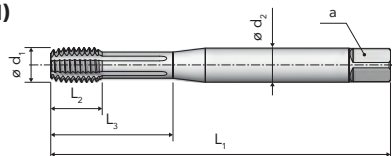


**NEW**  
**P901 NE**  
V-MAXX

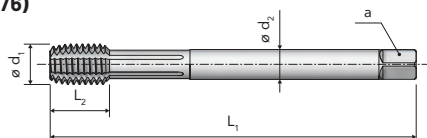
**P901 NE**  
RFD-MAXX

**NEW**  
**P901 NE 6GX**  
RFD-MAXX

**DIN 2174 (371)**  
≤ M10x1



**DIN 2174 (376)**  
≥ M12x1



**p** SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P901 NE<br>V-MAXX | P901 NE<br>RED-MAXX | P901 NE 6GX<br>RED-MAXX |  |
|-----|-------|-------------------|---------------------|-------------------------|--|
| P   | P.1-2 | ● 40-45           | ● 40-45             | ● 40-45                 |  |
|     | P.3   | ● 35-40           | ● 35-40             | ● 35-40                 |  |
|     | P.4   | ● 30-35           | ● 30-35             | ● 30-35                 |  |
|     | P.5   | ● 15-20           | ● 15-20             | ● 15-20                 |  |
|     | P.7   | ● 10-15           |                     |                         |  |
| M   | M.1   | ● 10-15           |                     |                         |  |
| N   | N.1-2 | ● 40-45           | ● 40-45             | ● 40-45                 |  |
|     | N.3   | ● 35-40           | ● 35-40             | ● 35-40                 |  |
|     | N.5-6 | ● 40-45           | ● 40-45             | ● 40-45                 |  |
| S   | S.3   | ● 10-15           | ● 10-15             | ● 10-15                 |  |

6HX

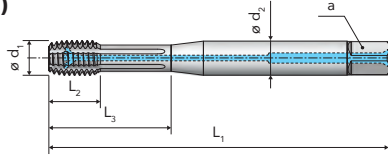
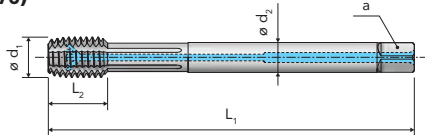
6Hx

6GX

[illegible]



HSSZ

BP901 N R  
RED-MAXXDIN 2174 (371)  
≤ M10x1DIN 2174 (376)  
≥ M12x1

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | BP901 N R<br>RED-MAXX |  |  |  |
|-----|-------|-----------------------|--|--|--|
| P   | P.1-2 | ● 40-45               |  |  |  |
|     | P.3   | ● 35-40               |  |  |  |
|     | P.4   | ● 30-35               |  |  |  |
|     | P.5   | ● 15-20               |  |  |  |
| N   | N.1-2 | ● 40-45               |  |  |  |
|     | N.3   | ● 35-40               |  |  |  |
|     | N.5-6 | ● 40-45               |  |  |  |
| S   | S.3   | ● 10-15               |  |  |  |

6HX



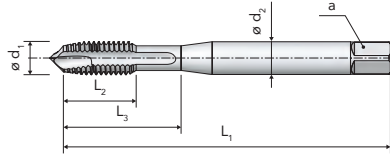
| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |       | BP901 N R<br>RED-MAXX<br>...9018R1AR0 |  |  |  |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|-------|---------------------------------------|--|--|--|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm]  |                                       |  |  |  |
| M 5             | 0,5  | 70                      | 8              | 25             | 6                     | 4,9      | 5   | 4,8   | A05050...                             |  |  |  |
| 6               | 0,75 | 80                      | 10             | 29             | 6                     | 4,9      | 5   | 5,65  | A06075...                             |  |  |  |
| 8               | 1    | 90                      | 13             | 35             | 8                     | 6,2      | 5   | 7,55  | A08100...                             |  |  |  |
| 10              | 1    | 90                      | 13             | 39             | 10                    | 8        | 6   | 9,55  | A10100...                             |  |  |  |
| 12              | 1    | 100                     | 13             | -              | 9                     | 7        | 8   | 11,55 | A12100...                             |  |  |  |
| 12              | 1,25 | 100                     | 13             | -              | 9                     | 7        | 8   | 11,45 | A12125...                             |  |  |  |
| 12              | 1,5  | 100                     | 15             | -              | 9                     | 7        | 8   | 11,3  | A12150...                             |  |  |  |
| 14              | 1,5  | 100                     | 15             | -              | 11                    | 9        | 8   | 13,3  | A14150...                             |  |  |  |
| 16              | 1,5  | 100                     | 15             | -              | 12                    | 9        | 8   | 15,3  | A16150...                             |  |  |  |



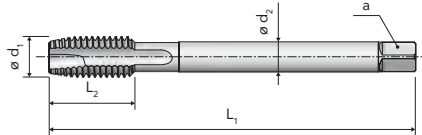
HSSP

NEW  
P19  
TiH1

**DIN 2184-1**  
≤ Ø1/4



**DIN 2184-1**  
≥ Ø5/16



**P** SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P19<br>T1H1 |  |  |  |
|-----|-------|-------------|--|--|--|
| P   | P.3   | ● 25-35     |  |  |  |
|     | P.4   | ● 20-30     |  |  |  |
|     | P.5   | ● 10-20     |  |  |  |
|     | P.6   | ● 8-10      |  |  |  |
|     | P.7   | ● 10-15     |  |  |  |
| M   | M.1   | ● 10-15     |  |  |  |
|     | M.2   | ● 6-8       |  |  |  |
| K   | K.2   | ● 25-35     |  |  |  |
| N   | N.2-3 | ● 30-40     |  |  |  |
|     | N.6   | ● 25-35     |  |  |  |

2BX



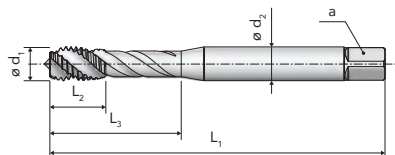
### 3xD

[illegible]

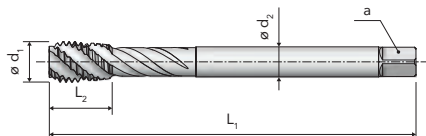


**NEW**  
**P60**  
TiH1

**DIN 2184-1**  
≤ Ø1/4"



**DIN 2184-1**  
≥ Ø5/16"



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | P60<br>T <sub>H1</sub> |  |  |  |
|-----|-----|------------------------|--|--|--|
| P   | P.3 | ● 20-30                |  |  |  |
|     | P.4 | ● 15-25                |  |  |  |
|     | P.5 | ● 5-15                 |  |  |  |
|     | P.7 | ● 8-10                 |  |  |  |
| M   | M.1 | ● 8-10                 |  |  |  |
|     | M.2 | ● 5-7                  |  |  |  |
| K   | K.2 | ● 20-30                |  |  |  |
| N   | N.3 | ● 25-35                |  |  |  |
|     | N.6 | ● 25-35                |  |  |  |
| S   | S.1 | ● 10-15                |  |  |  |
|     | S.3 | ● 10-15                |  |  |  |

2BX

[illegible]

## HIGH PERFORMANCE COLD FORMING TAPS for blind holes



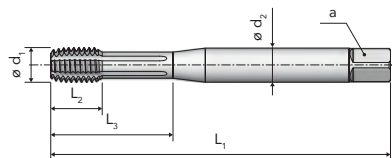
HSSZ



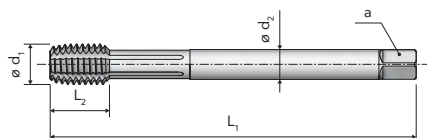
**NEW**  
**P903 NE**  
V-MAXX

**P903 NE**  
RED-MAXX

**DIN 2184-1**  
≤ Ø 3/8"



**DIN 2184-1**  
 $\geq \varnothing 7/16''$



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P903 NE<br>V-MAXX | P903 NE<br>RED-MAXX |  |  |
|-----|-------|-------------------|---------------------|--|--|
| P   | P.1-2 | ● 40-45           | ● 40-45             |  |  |
|     | P.3   | ● 35-40           | ● 35-40             |  |  |
|     | P.4   | ● 30-35           | ● 30-35             |  |  |
|     | P.5   | ● 15-20           | ● 15-20             |  |  |
|     | P.7   | ● 10-15           |                     |  |  |
| M   | M.1   | ● 10-15           |                     |  |  |
| N   | N.1-2 | ● 40-45           | ● 40-45             |  |  |
|     | N.3   | ● 35-40           | ● 35-40             |  |  |
|     | N.5-6 | ● 40-45           | ● 40-45             |  |  |
| S   | S.3   | ● 10-15           | ● 10-15             |  |  |

2BX

2BX



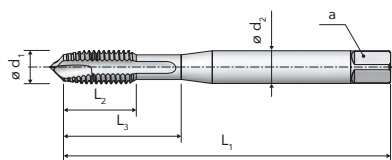
**P** SERIES

[illegible]

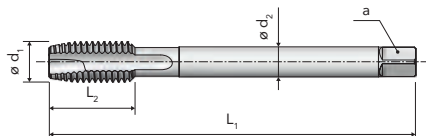


**NEW**  
**P20**  
TiH1

**DIN 2184-1**  
≤ Ø1/4



**DIN 2184-1**  
≥ Ø5/16



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P20<br>T <sub>IH1</sub> |  |  |  |
|-----|-------|-------------------------|--|--|--|
| P   | P.3   | ● 25-35                 |  |  |  |
|     | P.4   | ● 20-30                 |  |  |  |
|     | P.5   | ● 10-20                 |  |  |  |
|     | P.6   | ● 8-10                  |  |  |  |
|     | P.7   | ● 10-15                 |  |  |  |
| M   | M.1   | ● 10-15                 |  |  |  |
|     | M.2   | ● 6-8                   |  |  |  |
| K   | K.2   | ● 25-35                 |  |  |  |
| N   | N.2-3 | ● 30-40                 |  |  |  |
|     | N.6   | ● 25-35                 |  |  |  |

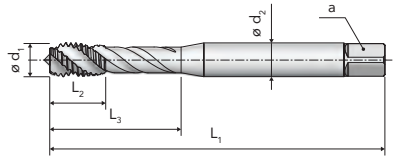
2BX

[illegible]

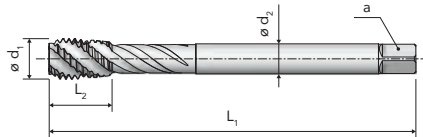


**NEW**  
**P61**  
TiH1

**DIN 2184-1**  
≤ Ø1/4"



**DIN 2184-1**  
≥ Ø5/16"



**P** SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | P61<br>T1H1 |  |  |  |
|-----|-----|-------------|--|--|--|
| P   | P.3 | ● 20-30     |  |  |  |
|     | P.4 | ● 15-25     |  |  |  |
|     | P.5 | ● 5-15      |  |  |  |
|     | P.7 | ● 8-10      |  |  |  |
| M   | M.1 | ● 8-10      |  |  |  |
|     | M.2 | ● 5-7       |  |  |  |
| K   | K.2 | ● 20-30     |  |  |  |
| N   | N.3 | ● 25-35     |  |  |  |
|     | N.6 | ● 25-35     |  |  |  |
| S   | S.1 | ● 10-15     |  |  |  |
|     | S.3 | ● 10-15     |  |  |  |

2BX

[illegible]



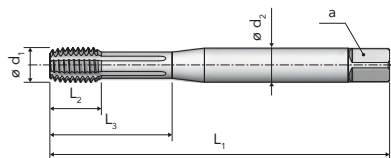
HSSZ



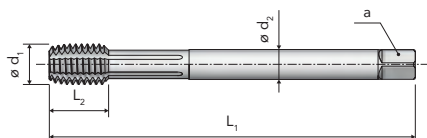
**NEW**  
**P904 NE**  
V-MAXX

**P904 NE**  
RED-MAXX

**DIN 2184-1**  
≤ Ø 3/8"



**DIN 2184-1**  
 $\geq \varnothing 7/16''$



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P904 NE<br>V-MAXX | P904 NE<br>RED-MAXX |  |  |
|-----|-------|-------------------|---------------------|--|--|
| P   | P.1-2 | ● 40-45           | ● 40-45             |  |  |
|     | P.3   | ● 35-40           | ● 35-40             |  |  |
|     | P.4   | ● 30-35           | ● 30-35             |  |  |
|     | P.5   | ● 15-20           | ● 15-20             |  |  |
|     | P.7   | ● 10-15           |                     |  |  |
| M   | M.1   | ● 10-15           |                     |  |  |
| N   | N.1-2 | ● 40-45           | ● 40-45             |  |  |
|     | N.3   | ● 35-40           | ● 35-40             |  |  |
|     | N.5-6 | ● 40-45           | ● 40-45             |  |  |
| S   | S.3   | ● 10-15           | ● 10-15             |  |  |

2BX

2BX





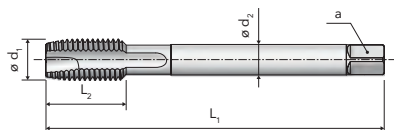
HSSP



**P18**  
TiN

**P18**  
TiH1

DIN 5156



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P18<br>TIN | P18<br>TIH1 |  |  |
|-----|-------|------------|-------------|--|--|
| P   | P.3   | ● 25-35    | ● 25-35     |  |  |
|     | P.4   | ● 20-30    | ● 20-30     |  |  |
|     | P.5   | ● 10-20    | ● 10-20     |  |  |
|     | P.6   | ● 8-10     | ● 8-10      |  |  |
|     | P.7   | ● 10-15    | ● 10-15     |  |  |
| M   | M.1   | ● 10-15    | ● 10-15     |  |  |
|     | M.2   | ● 6-8      | ● 6-8       |  |  |
| K   | K.2   | ● 25-35    | ● 25-35     |  |  |
| N   | N.2-3 | ● 30-40    | ● 30-40     |  |  |
|     | N.6   | ● 25-35    | ● 25-35     |  |  |

ISO  
5969 X

ISO  
5969 X

[illegible]

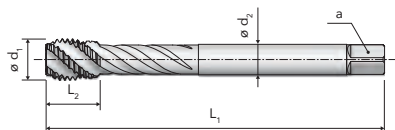


**P59**  
TiN

**P59**  
TiH1

**BP59**  
TiH1

DIN 5156



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | P59<br>TIN | P59<br>TIH1 | BP59<br>TIH1 |  |
|-----|-----|------------|-------------|--------------|--|
| P   | P.3 | ● 20-30    | ● 20-30     | ● 20-30      |  |
|     | P.4 | ● 15-25    | ● 15-25     | ● 15-25      |  |
|     | P.5 | ● 5-15     | ● 5-15      | ● 5-15       |  |
|     | P.7 | ● 8-10     | ● 8-10      | ● 8-10       |  |
| M   | M.1 | ● 8-10     | ● 8-10      | ● 8-10       |  |
|     | M.2 | ● 5-7      | ● 5-7       | ● 5-7        |  |
| K   | K.2 | ● 20-30    | ● 20-30     | ● 20-30      |  |
| N   | N.3 | ● 25-35    | ● 25-35     | ● 25-35      |  |
|     | N.6 | ● 25-35    | ● 25-35     | ● 25-35      |  |
| S   | S.1 |            | ● 10-15     | ● 10-15      |  |
|     | S.3 | ● 10-15    | ● 10-15     | ● 10-15      |  |

ISO  
5969 X



ISO  
5969 X



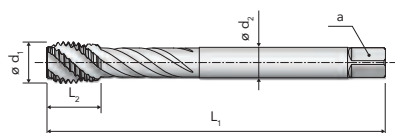
ISO  
5969 X

[illegible]



**P59 E**  
TiH1

DIN 5156



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | P59 E<br>TIH1 |  |  |  |
|-----|-----|---------------|--|--|--|
| P   | P.3 | ● 20-30       |  |  |  |
|     | P.4 | ● 15-25       |  |  |  |
|     | P.5 | ● 5-15        |  |  |  |
|     | P.7 | ● 8-10        |  |  |  |
| M   | M.1 | ● 8-10        |  |  |  |
|     | M.2 | ● 5-7         |  |  |  |
| K   | K.2 | ● 20-30       |  |  |  |
| N   | N.3 | ● 25-35       |  |  |  |
|     | N.6 | ● 25-35       |  |  |  |
| S   | S.1 | ● 10-15       |  |  |  |
|     | S.3 | ● 10-15       |  |  |  |

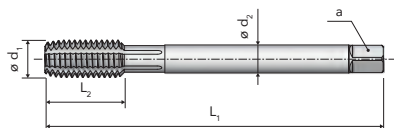
ISO  
5969 X





**NEW**  
**P82 N**  
V-MAXX

DIN 2189



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P82 N<br>V-MAXX |  |  |  |
|-----|-------|-----------------|--|--|--|
| P   | P.1-2 | ● 20-25         |  |  |  |
|     | P.3   | ● 15-20         |  |  |  |
| N   | N.1-2 | ● 20-25         |  |  |  |
|     | N.3   | ● 15-20         |  |  |  |
|     | N.5-6 | ● 20-25         |  |  |  |

ISO  
5969 X



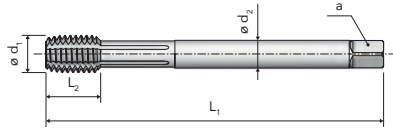


HSSZ


NEW  
P902 N  
V-MAXX

P902 N  
RED-MAXX

DIN 2189



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P902 N<br>V-MAXX | P902 N<br>RED-MAXX |  |  |
|-----|-------|------------------|--------------------|--|--|
| P   | P.1-2 | • 40-45          | • 40-45            |  |  |
|     | P.3   | • 35-40          | • 35-40            |  |  |
|     | P.4   | • 30-35          | • 30-35            |  |  |
|     | P.5   | • 15-20          | • 15-20            |  |  |
|     | P.7   | • 10-15          |                    |  |  |
| M   | M.1   | • 10-15          |                    |  |  |
| N   | N.1-2 | • 40-45          | • 40-45            |  |  |
|     | N.3   | • 35-40          | • 35-40            |  |  |
|     | N.5-6 | • 40-45          | • 40-45            |  |  |
| S   | S.3   | • 10-15          | • 10-15            |  |  |

ISO  
5969 X

ISO  
5969 X

P  
SERIES

| G    | P     | Ød <sub>1</sub> | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h9 | a<br>h12 | z   |      | P902 N<br>V-MAXX<br>...9028G1LV0 | P902 N<br>RED-MAXX<br>...9028G1LR0 |  |  |
|------|-------|-----------------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|----------------------------------|------------------------------------|--|--|
|      | [TPI] | [mm]            | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                  |                                    |  |  |
| 1/8" | 28    | 9,728           | 90                      | 12             | -              | 7                     | 5,5      | 6   | 9,25 | AGA180...                        | AGA180...                          |  |  |
| 1/4" | 19    | 13,157          | 100                     | 17             | -              | 11                    | 9        | 8   | 12,5 | AGB140...                        | AGB140...                          |  |  |
| 3/8" | 19    | 16,662          | 100                     | 17             | -              | 12                    | 9        | 8   | 16   | AGC380...                        | AGC380...                          |  |  |
| 1/2" | 14    | 20,955          | 125                     | 23             | -              | 16                    | 12       | 8   | 20   | AGD120...                        | AGD120...                          |  |  |
| 3/4" | 14    | 26,441          | 140                     | 23             | -              | 20                    | 16       | 8   | 25,5 | AGF340...                        | AGF340...                          |  |  |



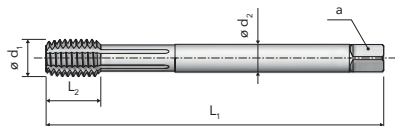
HSSZ



**NEW**  
**P902 NE**  
V-MAXX

**P902 NE**  
RED-MAXX

DIN 2189



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | P902 NE<br>V-MAXX | P902 NE<br>RED-MAXX |  |  |
|-----|-------|-------------------|---------------------|--|--|
| P   | P.1-2 | ● 40-45           | ● 40-45             |  |  |
|     | P.3   | ● 35-40           | ● 35-40             |  |  |
|     | P.4   | ● 30-35           | ● 30-35             |  |  |
|     | P.5   | ● 15-20           | ● 15-20             |  |  |
|     | P.7   | ● 10-15           |                     |  |  |
| M   | M.1   | ● 10-15           |                     |  |  |
| N   | N.1-2 | ● 40-45           | ● 40-45             |  |  |
|     | N.3   | ● 35-40           | ● 35-40             |  |  |
|     | N.5-6 | ● 40-45           | ● 40-45             |  |  |
| S   | S.3   | ● 10-15           | ● 10-15             |  |  |

ISO  
5969 X

ISO  
5969 X



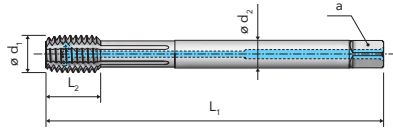


HSSZ



**BP902 N R**  
RED-MAXX

DIN 2189



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | BP902 N R | RED-MAXX |  |  |
|-----|-------|-----------|----------|--|--|
| P   | P.1-2 | ● 40-45   |          |  |  |
|     | P.3   | ● 35-40   |          |  |  |
|     | P.4   | ● 30-35   |          |  |  |
|     | P.5   | ● 15-20   |          |  |  |
| N   | N.1-2 | ● 40-45   |          |  |  |
|     | N.3   | ● 35-40   |          |  |  |
|     | N.5-6 | ● 40-45   |          |  |  |
| S   | S.3   | ● 10-15   |          |  |  |

ISO  
5969 X







## **S SERIES**

SYNCHRONOUS TAPS



# MACHINE TAPS FOR SYNCHRONOUS TAPPING for blind and through holes

## Straight flutes / for cast iron



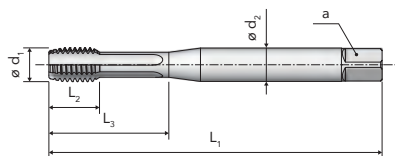
**S43**  
V-MAXX

**BS43**  
V-MAXX

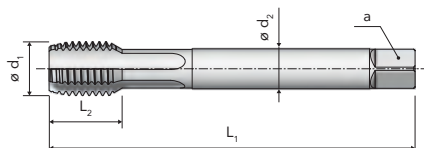
**S43 E**  
V-MAXX

**BS43 E**  
V-MAXX

~DIN 371  
≤ M12 (\*)



~DIN 376  
≥ M16 (\*)



### APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG     | S43<br>V-MAXX | BS43<br>V-MAXX | S43 E<br>V-MAXX | BS43 E<br>V-MAXX |
|-----|--------|---------------|----------------|-----------------|------------------|
| K   | K.1    | ● 55-65       | ● 55-65        | ● 55-65         | ● 55-65          |
| N   | N.4    | ● 55-65       | ● 55-65        | ● 55-65         | ● 55-65          |
|     | N.7    | ● 55-65       | ● 55-65        | ● 55-65         | ● 55-65          |
|     | N.9-10 | ● 55-65       | ● 55-65        | ● 55-65         | ● 55-65          |



**6HX**

**6HX**

**6HX**

**6HX**



| Ød1        | P    | L1<br>js 16 | L2   | L3   | Ød2<br>h6 | a<br>h12 | z   |      | S43<br>V-MAXX<br>...0433N1AV0 | BS43<br>V-MAXX<br>...0433P1AV0 | S43 E<br>V-MAXX<br>...0433N3AV0 | BS43 E<br>V-MAXX<br>...0433P3AV0 |
|------------|------|-------------|------|------|-----------|----------|-----|------|-------------------------------|--------------------------------|---------------------------------|----------------------------------|
| [mm]       | [mm] | [mm]        | [mm] | [mm] | [mm]      | [mm]     | [-] | [mm] |                               |                                |                                 |                                  |
| <b>M 3</b> | 0,5  | 70          | 5    | 15   | 6         | 4,9      | 3   | 2,5  | A00030...                     |                                |                                 |                                  |
| <b>4</b>   | 0,7  | 70          | 7    | 18   | 6         | 4,9      | 3   | 3,3  | A00040...                     |                                | A00040...                       |                                  |
| <b>5</b>   | 0,8  | 70          | 8    | 23   | 6         | 4,9      | 3   | 4,2  | A00050...                     | A00050...                      | A00050...                       | A00050...                        |
| <b>6</b>   | 1    | 80          | 10   | 29   | 6         | 4,9      | 4   | 5    | A00060...                     | A00060...                      | A00060...                       | A00060...                        |
| <b>8</b>   | 1,25 | 90          | 11   | 33   | 8         | 6,2      | 4   | 6,8  | A00080...                     | A00080...                      | A00080...                       | A00080...                        |
| <b>10</b>  | 1,5  | 100         | 13   | 36   | 10        | 8        | 4   | 8,5  | A00100...                     | A00100...                      | A00100...                       | A00100...                        |
| <b>12</b>  | 1,75 | 110         | 16   | 42   | 12        | 9        | 4   | 10,2 | A00120...                     | A00120...                      | A00120...                       | A00120...                        |
| <b>16</b>  | 2    | 110         | 18   | -    | 12        | 9        | 4   | 14   | A00160...                     | A00160...                      | A00160...                       | A00160...                        |
| <b>20</b>  | 2,5  | 140         | 23   | -    | 16        | 12       | 4   | 17,5 | A00200...                     | A00200...                      | A00200...                       | A00200...                        |

(\*) = DIN 1835-B on request

# MACHINE TAPS FOR SYNCHRONOUS TAPPING for through holes

## Straight flutes with spiral point

**DIN 13**

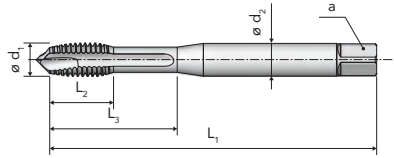


**S15**  
TiN

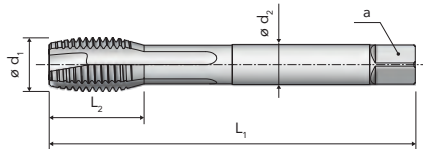
**S15**  
TiH1

**BS15**  
TiH1

~DIN 371  
≤ M12 (\*)



~DIN 376  
≥ M14 (\*)



### APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | S15<br>TiN | S15<br>TiH1 | BS15<br>TiH1 |
|-----|-------|------------|-------------|--------------|
| P   | P.1-2 | ● 50-60    | ● 50-60     | ● 50-60      |
|     | P.3   | ● 45-55    | ● 45-55     | ● 45-55      |
|     | P.4   | ● 40-50    | ● 40-50     | ● 40-50      |
|     | P.5   | ● 15-25    | ● 15-25     | ● 15-25      |
|     | P.7   | ● 15-25    | ● 15-25     | ● 15-25      |
| M   | M.1   | ● 15-25    | ● 15-25     | ● 15-25      |
|     | M.2   | ● 10-20    | ● 10-20     | ● 10-20      |
| K   | K.2   | ● 45-55    | ● 45-55     | ● 45-55      |
| N   | N.1   | ● 50-60    | ● 50-60     | ● 50-60      |
|     | N.2-3 | ● 45-55    | ● 45-55     | ● 45-55      |
|     | N.5   | ● 40-50    | ● 40-50     | ● 40-50      |
|     | N.6   | ● 35-45    | ● 35-45     | ● 35-45      |
| S   | S.1   | ● 15-25    | ● 15-25     | ● 15-25      |
|     | S.3   | ● 15-25    | ● 15-25     | ● 15-25      |

**6HX**



**6HX**



**6HX**



SERIES

**S**

| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h6 | a<br>h12 | z   |      | S15<br>TiN<br>...0153N2AD0 | S15<br>TiH1<br>...0153N2AH0 | BS15<br>TiH1<br>...0153P2AH0 |
|-----------------|------|------------------------|----------------|----------------|-----------------------|----------|-----|------|----------------------------|-----------------------------|------------------------------|
| [mm]            | [mm] | [mm]                   | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                            |                             |                              |
| <b>M3</b>       | 0,5  | 70                     | 5              | 15             | 6                     | 4,9      | 3   | 2,5  | A00030...                  | A00030...                   |                              |
| <b>4</b>        | 0,7  | 70                     | 7              | 18             | 6                     | 4,9      | 3   | 3,3  | A00040...                  | A00040...                   |                              |
| <b>5</b>        | 0,8  | 70                     | 8              | 25             | 6                     | 4,9      | 3   | 4,2  | A00050...                  | A00050...                   | A00050...                    |
| <b>6</b>        | 1    | 80                     | 10             | 30             | 6                     | 4,9      | 3   | 5    | A00060...                  | A00060...                   | A00060...                    |
| <b>8</b>        | 1,25 | 90                     | 12,5           | 35             | 8                     | 6,2      | 3   | 6,8  | A00080...                  | A00080...                   | A00080...                    |
| <b>10</b>       | 1,5  | 100                    | 15             | 39             | 10                    | 8        | 3   | 8,5  | A00100...                  | A00100...                   | A00100...                    |
| <b>12</b>       | 1,75 | 110                    | 17,5           | 42             | 12                    | 9        | 3   | 10,2 | A00120...                  | A00120...                   | A00120...                    |
| <b>14</b>       | 2    | 110                    | 20             | -              | 12                    | 9        | 3   | 12   | A00140...                  | A00140...                   |                              |
| <b>16</b>       | 2    | 110                    | 20             | -              | 12                    | 9        | 4   | 14   | A00160...                  | A00160...                   | A00160...                    |

(\*) = DIN 1835-B on request

€ P.55

Order example for **S15 TiN M3** ---> A000300153N2AD0

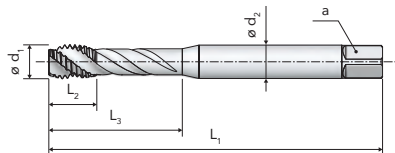


**S70**  
TiN

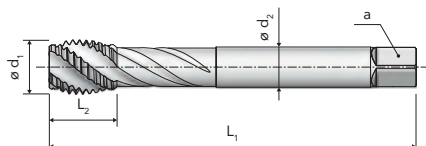
**S70**  
TiH1

**BS70**  
TiH1

~DIN 371  
≤ M12 (\*)



~DIN 376  
≥ M14 (\*)



## 6HX

6HX

6HX



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | S70<br>TIN | S70<br>TIH1 | BS70<br>TIH1 |  |
|-----|-------|------------|-------------|--------------|--|
| P   | P.1-2 | ● 45-55    | ● 45-55     | ● 45-55      |  |
|     | P.3   | ● 40-50    | ● 40-50     | ● 40-50      |  |
|     | P.4   | ● 35-45    | ● 35-45     | ● 35-45      |  |
|     | P.5   | ● 15-20    | ● 15-20     | ● 15-20      |  |
|     | P.7   | ● 15-20    | ● 15-20     | ● 15-20      |  |
| M   | M.1   | ● 15-20    | ● 15-20     | ● 15-20      |  |
| K   | K.2   | ● 40-50    | ● 40-50     | ● 40-50      |  |
| N   | N.1   | ● 45-55    | ● 45-55     | ● 45-55      |  |
|     | N.2-3 | ● 40-50    | ● 40-50     | ● 40-50      |  |
|     | N.5   | ● 35-45    | ● 35-45     | ● 35-45      |  |
|     | N.6   | ● 30-40    | ● 30-40     | ● 30-40      |  |
| S   | S.1   |            | ● 15-20     | ● 15-20      |  |
|     | S.3   | ● 15-20    | ● 15-20     | ● 15-20      |  |

[illegible]

(\*)= DIN 1835-B on request



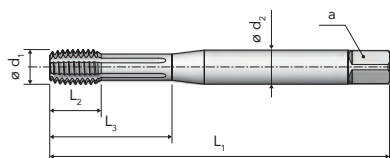
**S80 N**  
TiN

**S80 N**  
V-MAXX

**S80 N 6GX**  
TiN

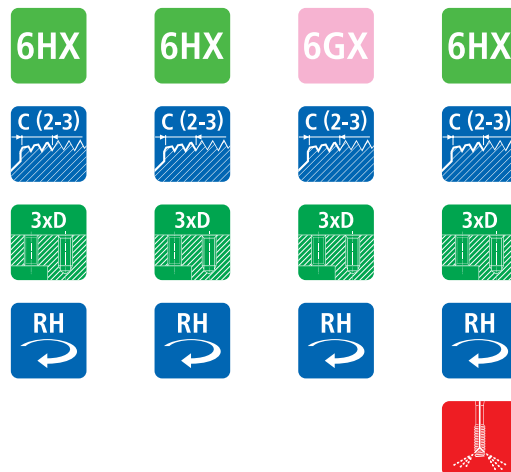
**BS80 N R**  
TiN

~DIN 371(\*)



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | S80 N<br>TIN | S80 N<br>V-MAXX | S80 N 6GX<br>TIN | BS80 N R<br>TIN |
|-----|-------|--------------|-----------------|------------------|-----------------|
| P   | P.1-2 | ● 50-60      | ● 50-60         | ● 50-60          | ● 50-60         |
|     | P.3   | ● 45-55      | ● 45-55         | ● 45-55          | ● 45-55         |
|     | P.4   | ● 40-50      | ● 40-50         | ● 40-50          | ● 40-50         |
|     | P.5   | ● 20-30      | ● 20-30         | ● 20-30          | ● 20-30         |
| M   | P.7   | ● 10-20      | ● 10-20         | ● 10-20          | ● 10-20         |
|     | M.1   | ● 10-20      | ● 10-20         | ● 10-20          | ● 10-20         |
| N   | M.2   | ● 50-60      | ● 50-60         | ● 50-60          | ● 50-60         |
|     | N.1-2 | ● 45-55      | ● 45-55         | ● 45-55          | ● 45-55         |
|     | N.3   | ● 50-60      | ● 50-60         | ● 50-60          | ● 50-60         |
|     | N.5-6 | ● 10-20      | ● 10-20         | ● 10-20          | ● 10-20         |
| S   | S.3   | ● 10-20      | ● 10-20         | ● 10-20          | ● 10-20         |



SERIES

[illegible]

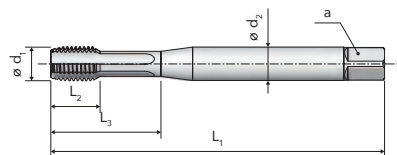
(\*)= DIN 1835-B on request



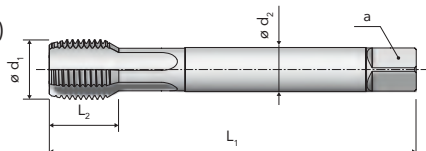
**S45**  
V-MAXX

**BS45**  
V-MAXX

~DIN 371  
≤ M12x1,5 (\*)



~DIN 376  
≥ M14x1,5 (\*)



6HX

6HX



| APPLICATION RANGE - CUTTING SPEED m/min |        |               |                |  |  |
|-----------------------------------------|--------|---------------|----------------|--|--|
| ISO                                     | MG     | S45<br>V-MAXX | BS45<br>V-MAXX |  |  |
| K                                       | K.1    | ● 55-65       | ● 55-65        |  |  |
| N                                       | N.4    | ● 55-65       | ● 55-65        |  |  |
|                                         | N.7    | ● 55-65       | ● 55-65        |  |  |
|                                         | N.9-10 | ● 55-65       | ● 55-65        |  |  |

[illegible]

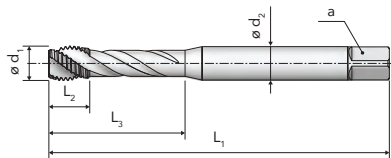
(\*)= DIN 1835-B on request



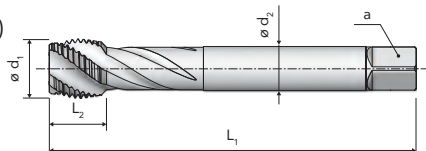


**S71**  
TiN

~DIN 371  
≤ M12x1,5 (\*)



~DIN 376  
≥ M14x1,5 (\*)



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | S71<br>TiN |  |  |  |
|-----|-------|------------|--|--|--|
| P   | P.1-2 | ● 45-55    |  |  |  |
|     | P.3   | ● 40-50    |  |  |  |
|     | P.4   | ● 35-45    |  |  |  |
|     | P.5   | ● 15-20    |  |  |  |
|     | P.7   | ● 15-20    |  |  |  |
| M   | M.1   | ● 15-20    |  |  |  |
| K   | K.2   | ● 40-50    |  |  |  |
| N   | N.1   | ● 45-55    |  |  |  |
|     | N.2-3 | ● 40-50    |  |  |  |
|     | N.5   | ● 35-45    |  |  |  |
|     | N.6   | ● 30-40    |  |  |  |
| S   | S.3   | ● 15-20    |  |  |  |

## 6HX

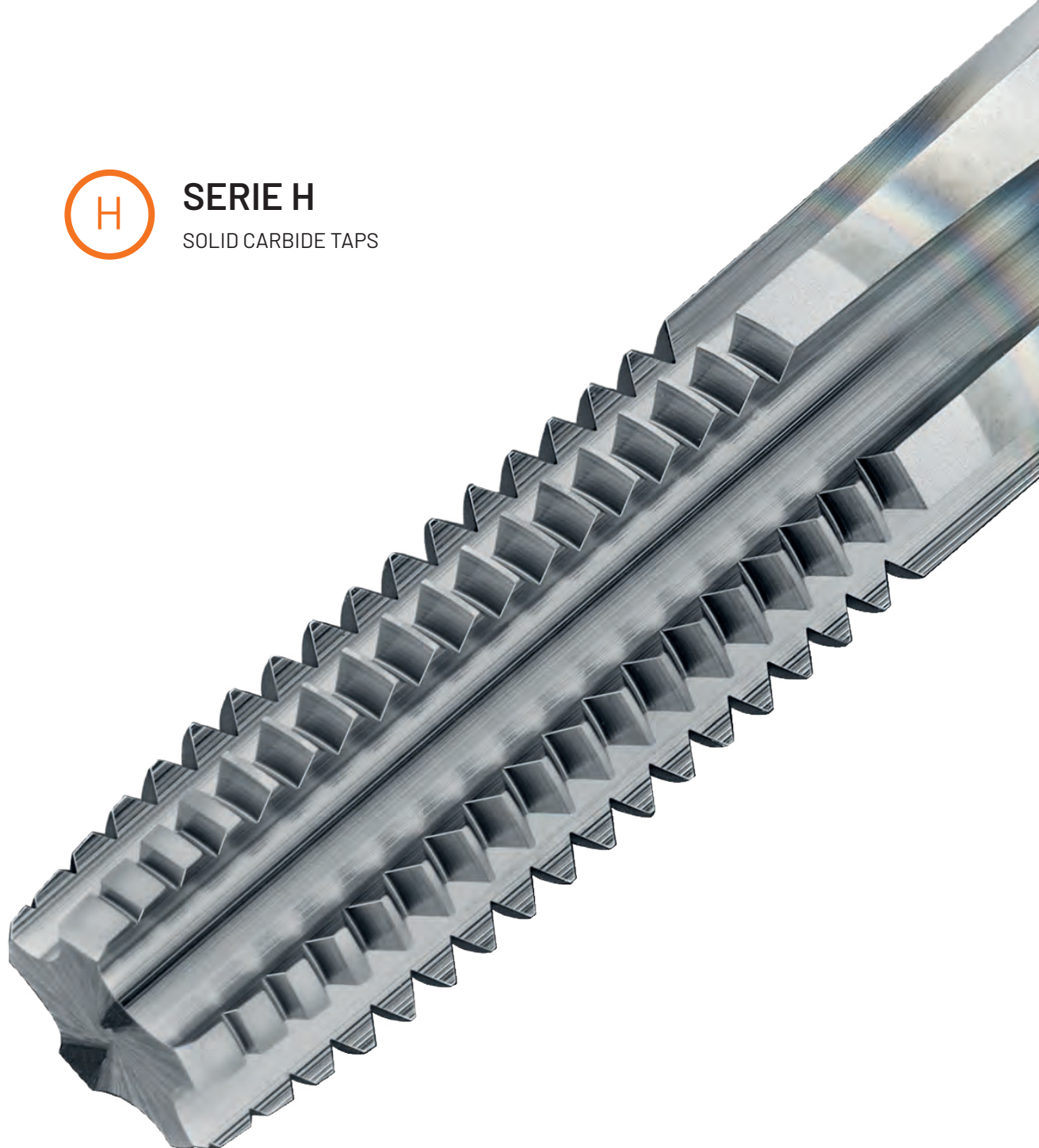
[illegible]

(\*)= DIN 1835-B on request



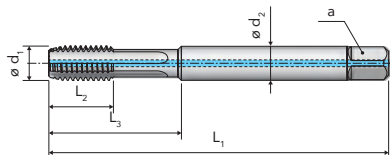
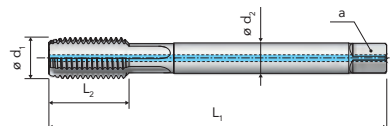
## SERIE H

SOLID CARBIDE TAPS





HM

HB43  
BRIGHTHB43  
V-MAXXHB43 E  
V-MAXXDIN 371  
≤ M10DIN 376  
≥ M12

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG     | HB43<br>BRIGHT | HB43<br>V-MAXX | HB43 E<br>V-MAXX |
|-----|--------|----------------|----------------|------------------|
| K   | K.1    | ● 40-50        | ● 55-65        | ● 55-65          |
| N   | N.4    | ● 40-50        | ● 55-65        | ● 55-65          |
|     | N.7    | ● 40-50        | ● 55-65        | ● 55-65          |
|     | N.9-10 | ● 45-55        | ● 55-65        | ● 55-65          |



6HX



6HX



6HX



| Ød1    | P    | L1<br>js 16 | L2   | L3   | Ød2<br>h6 | a<br>h12 | z   |      | HB43<br>BRIGHT<br>...0439M1AA0 | HB43<br>V-MAXX<br>...0439M1AV0 | HB43 E<br>V-MAXX<br>...0439M3AV0 |
|--------|------|-------------|------|------|-----------|----------|-----|------|--------------------------------|--------------------------------|----------------------------------|
| [mm]   | [mm] | [mm]        | [mm] | [mm] | [mm]      | [mm]     | [-] | [mm] |                                |                                |                                  |
| M 3(*) | 0,5  | 56          | 8    | 18   | 3,5       | 2,7      | 3   | 2,5  | A00030...                      | A00030...                      |                                  |
| 4(*)   | 0,7  | 63          | 10   | 21   | 4,5       | 3,4      | 4   | 3,3  | A00040...                      | A00040...                      |                                  |
| 5      | 0,8  | 70          | 10   | 25   | 6         | 4,9      | 4   | 4,2  | A00050...                      | A00050...                      | A00050...                        |
| 6      | 1    | 80          | 12   | 30   | 6         | 4,9      | 4   | 5    | A00060...                      | A00060...                      | A00060...                        |
| 8      | 1,25 | 90          | 16   | 35   | 8         | 6,2      | 4   | 6,8  | A00080...                      | A00080...                      | A00080...                        |
| 10     | 1,5  | 100         | 18   | 39   | 10        | 8        | 4   | 8,5  | A00100...                      | A00100...                      | A00100...                        |
| NEW 12 | 1,75 | 110         | 22   | -    | 9         | 7        | 4   | 10,2 | A00120...                      | A00120...                      | A00120...                        |

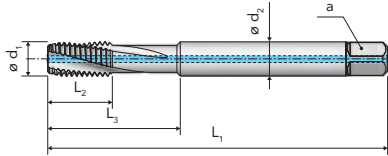
(\*) = Taps without through coolant



**HB29**  
BRIGHT

**HB29**  
V-MAXX

DIN 371



6HX

6HX

H  
SERIES

APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | HB29<br>BRIGHT | HB29<br>V-MAXX |  |  |
|-----|-------|----------------|----------------|--|--|
| N   | N.1-2 | ● 15-30        | ● 25-50        |  |  |
|     | N.3   | ● 20-30        | ● 30-50        |  |  |
|     | N.4   | ● 15-20        | ● 25-40        |  |  |
|     | N.7   | ● 20-25        | ● 30-40        |  |  |

(\*)= Taps without through coolant

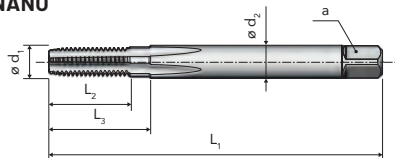


HM

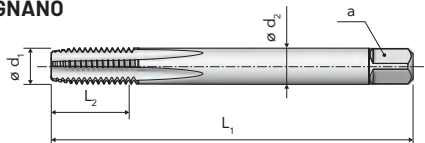
**H130**  
BRIGHT

**H130**  
V-MAXX

**NORM VERGNANO**  
≤ M5



**NORM VERGNANO**  
≥ M6



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG  | H130<br>BRIGHT | H130<br>V-MAXX |  |  |
|-----|-----|----------------|----------------|--|--|
| H   | H.1 | ● 2-3          | ● 3-6          |  |  |
|     | H.2 | ● 1-2          | ● 2-4          |  |  |

ISO2  
6H

# ISO26H

[illegible]

(\*)= The hole diameters are oversized

SOLID CARBIDE COLD FORMING TAPS for blind and through holes  
With oil grooves / internal coolant

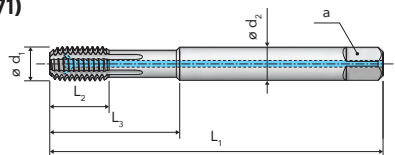


HM

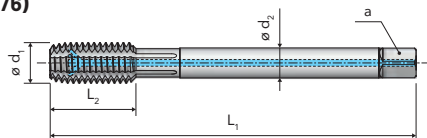
**HB80 N R**  
V-MAXX

**HB80 N R E**  
V-MAXX

~DIN 2174 (371)  
≤ M10



**DIN 2174 (376)**  
≥ M12



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | HB80 N R<br>V-MAXX | HB80 N R E<br>V-MAXX |  |  |
|-----|-------|--------------------|----------------------|--|--|
| P   | P.1-2 | ● 40-50            | ● 40-50              |  |  |
|     | P.3   | ● 35-45            | ● 35-45              |  |  |
|     | P.4   | ● 30-40            | ● 30-40              |  |  |
|     | P.5   | ● 15-25            | ● 15-25              |  |  |
|     | P.7   | ● 10-20            | ● 10-20              |  |  |
| M   | M.1   | ● 10-20            | ● 10-20              |  |  |
| N   | N.1-2 | ● 40-50            | ● 40-50              |  |  |
|     | N.3   | ● 35-45            | ● 35-45              |  |  |
|     | N.5-6 | ● 40-50            | ● 40-50              |  |  |
| S   | S.3   | ● 10-20            | ● 10-20              |  |  |

6HX

6HX



# H SERIES

[illegible]

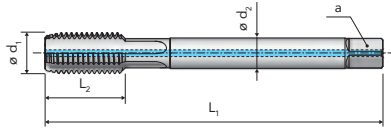
(\*)= Taps without through coolant



HM

HB45  
BRIGHTHB45  
V-MAXXHB45 E  
V-MAXX

DIN 374



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG     | HB45<br>BRIGHT | HB45<br>V-MAXX | HB45 E<br>V-MAXX |
|-----|--------|----------------|----------------|------------------|
| K   | K.1    | • 40-50        | • 55-65        | • 55-65          |
| N   | N.4    | • 40-50        | • 55-65        | • 55-65          |
|     | N.7    | • 40-50        | • 55-65        | • 55-65          |
|     | N.9-10 | • 45-55        | • 55-65        | • 55-65          |



6HX

6HX

6HX



| Ød <sub>1</sub> | P    | L <sub>1</sub><br>js 16 | L <sub>2</sub> | L <sub>3</sub> | Ød <sub>2</sub><br>h6 | a<br>h12 | z   |      | HB45<br>BRIGHT<br>...0459M1AA0 | HB45<br>V-MAXX<br>...0459M1AV0 | HB45 E<br>V-MAXX<br>...0459M3AV0 |
|-----------------|------|-------------------------|----------------|----------------|-----------------------|----------|-----|------|--------------------------------|--------------------------------|----------------------------------|
| [mm]            | [mm] | [mm]                    | [mm]           | [mm]           | [mm]                  | [mm]     | [-] | [mm] |                                |                                |                                  |
| M 10            | 1    | 90                      | 18             | -              | 7                     | 5,5      | 4   | 9    | A10100...                      | A10100...                      | A10100...                        |
| 12              | 1,25 | 100                     | 22             | -              | 9                     | 7        | 4   | 10,8 | A12125...                      | A12125...                      | A12125...                        |
| 12              | 1,5  | 100                     | 22             | -              | 9                     | 7        | 4   | 10,5 | A12150...                      | A12150...                      | A12150...                        |
| 14              | 1,5  | 100                     | 22             | -              | 11                    | 9        | 4   | 12,5 | A14150...                      | A14150...                      | A14150...                        |
| 16              | 1,5  | 100                     | 22             | -              | 12                    | 9        | 4   | 14,5 | A16150...                      | A16150...                      | A16150...                        |

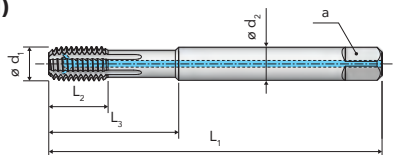
SOLID CARBIDE COLD FORMING TAPS for blind and through holes  
With oil grooves / internal coolant / chamfer form E



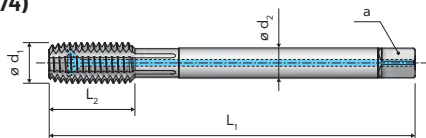
HM

**HB81 N R E**  
V-MAXX

**DIN 2174 (371)**  
≤ M10x1,25



**DIN 2174 (374)**  
≥ M12x1,25



APPLICATION RANGE - CUTTING SPEED m/min

| ISO | MG    | HB81N R E | V-MAXX |  |  |
|-----|-------|-----------|--------|--|--|
| P   | P.1-2 | ● 40-50   |        |  |  |
|     | P.3   | ● 35-45   |        |  |  |
|     | P.4   | ● 30-40   |        |  |  |
|     | P.5   | ● 15-25   |        |  |  |
|     | P.7   | ● 10-20   |        |  |  |
| M   | M.1   | ● 10-20   |        |  |  |
| N   | N.1-2 | ● 40-50   |        |  |  |
|     | N.3   | ● 35-45   |        |  |  |
|     | N.5-6 | ● 40-50   |        |  |  |
| S   | S.3   | ● 10-20   |        |  |  |

## 6HX

**E (1,5-2)**

2,5xD

H  
SERIES





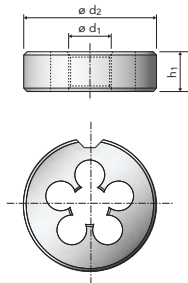
**F SERIES**

DIES



X200  
BRIGHTX200 LH  
BRIGHT

## DIN EN 22568



## APPLICATION RANGE

| ISO | MG    | X200<br>BRIGHT | X200 LH<br>BRIGHT |  |  |
|-----|-------|----------------|-------------------|--|--|
| P   | P.1-4 | •              | •                 |  |  |
|     | P.7   | •              | •                 |  |  |
| M   | M.1   | •              | •                 |  |  |
| K   | K.2   | •              | •                 |  |  |
| N   | N.1-3 | •              | •                 |  |  |
|     | N.5-7 | •              | •                 |  |  |

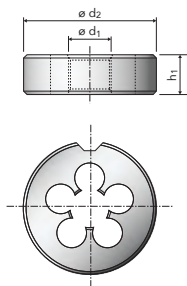


| $\varnothing d_1$ | P    | $\varnothing d_2$ | h1   | z   | X200<br>BRIGHT<br>...D00000 | X200 LH<br>BRIGHT<br>...S00000 |
|-------------------|------|-------------------|------|-----|-----------------------------|--------------------------------|
| [mm]              | [mm] | [mm]              | [mm] | [-] |                             |                                |
| M 2               | 0,4  | 16                | 5    | 3   | X20000020...                |                                |
| 2,2               | 0,45 | 16                | 5    | 3   | X20000022...                |                                |
| 2,5               | 0,45 | 16                | 5    | 3   | X20000025...                |                                |
| 3                 | 0,5  | 20                | 5    | 4   | X20000030...                | X20000030...                   |
| 3,5               | 0,6  | 20                | 5    | 4   | X20000035...                |                                |
| 4                 | 0,7  | 20                | 5    | 4   | X20000040...                | X20000040...                   |
| 5                 | 0,8  | 20                | 7    | 4   | X20000050...                | X20000050...                   |
| 6                 | 1    | 20                | 7    | 4   | X20000060...                | X20000060...                   |
| 7                 | 1    | 25                | 9    | 4   | X20000070...                |                                |
| 8                 | 1,25 | 25                | 9    | 4   | X20000080...                | X20000080...                   |
| 9                 | 1,25 | 25                | 9    | 4   | X20000090...                |                                |
| 10                | 1,5  | 30                | 11   | 4   | X20000100...                | X20000100...                   |
| 11                | 1,5  | 30                | 11   | 5   | X20000110...                |                                |
| 12                | 1,75 | 38                | 14   | 4   | X20000120...                | X20000120...                   |
| 14                | 2    | 38                | 14   | 4   | X20000140...                | X20000140...                   |
| 16                | 2    | 45                | 18   | 4   | X20000160...                |                                |
| 18                | 2,5  | 45                | 18   | 5   | X20000180...                |                                |
| 20                | 2,5  | 45                | 18   | 5   | X20000200...                |                                |
| 22                | 2,5  | 55                | 22   | 5   | X20000220...                |                                |
| 24                | 3    | 55                | 22   | 5   | X20000240...                |                                |
| 27                | 3    | 65                | 25   | 5   | X20000270...                |                                |
| 30                | 3,5  | 65                | 25   | 6   | X20000300...                |                                |
| 33                | 3,5  | 65                | 25   | 6   | X20000330...                |                                |
| 36                | 4    | 65                | 25   | 7   | X20000360...                |                                |
| 39                | 4    | 75                | 30   | 6   | X20000390...                |                                |



**X201**  
BRIGHT

DIN EN 22568



APPLICATION RANGE

| ISO | MG    | X201<br>BRIGHT |  |  |  |
|-----|-------|----------------|--|--|--|
| P   | P.1-4 | •              |  |  |  |
|     | P.7   | •              |  |  |  |
| M   | M.1   | •              |  |  |  |
| K   | K.2   | •              |  |  |  |
| N   | N.1-3 | •              |  |  |  |
|     | N.5-7 | •              |  |  |  |



| $\varnothing d_1$ | P    | $\varnothing d_2$ | h1   | z   | X201<br>BRIGHT<br>...D00000 |
|-------------------|------|-------------------|------|-----|-----------------------------|
| [mm]              | [mm] | [mm]              | [mm] | [-] |                             |
| M 2               | 0,25 | 16                | 5    | 3   | X20102025...                |
| 2,2               | 0,25 | 16                | 5    | 3   | X20102225...                |
| 2,5               | 0,35 | 16                | 5    | 3   | X20102535...                |
| 3                 | 0,35 | 20                | 5    | 4   | X20103035...                |
| 4                 | 0,5  | 20                | 5    | 4   | X20104050...                |
| 5                 | 0,5  | 20                | 5    | 4   | X20105050...                |
| 6                 | 0,75 | 20                | 7    | 4   | X20106075...                |
| 7                 | 0,75 | 25                | 9    | 4   | X20107075...                |
| 8                 | 0,75 | 25                | 9    | 4   | X20108075...                |
| 8                 | 1    | 25                | 9    | 4   | X20108100...                |
| 9                 | 1    | 25                | 9    | 5   | X20109100...                |
| 10                | 0,75 | 30                | 11   | 5   | X20110075...                |
| 10                | 1    | 30                | 11   | 4   | X20110100...                |
| 10                | 1,25 | 30                | 11   | 4   | X20110125...                |
| 11                | 1    | 30                | 11   | 5   | X20111100...                |
| 12                | 1    | 38                | 10   | 5   | X20112100...                |
| 12                | 1,25 | 38                | 10   | 4   | X20112125...                |
| 12                | 1,5  | 38                | 10   | 4   | X20112150...                |
| 14                | 1    | 38                | 10   | 5   | X20114100...                |
| 14                | 1,25 | 38                | 10   | 5   | X20114125...                |
| 14                | 1,5  | 38                | 10   | 5   | X20114150...                |
| 15                | 1    | 38                | 10   | 5   | X20115100...                |
| 15                | 1,5  | 38                | 10   | 5   | X20115150...                |
| 16                | 1    | 45                | 14   | 5   | X20116100...                |
| 16                | 1,5  | 45                | 14   | 5   | X20116150...                |
| 18                | 1    | 45                | 14   | 5   | X20118100...                |

F  
SERIES



P.60

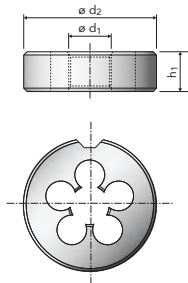
Order example for X201 BRIGHT M2x0,25--> X20102025D00000

vergnano | 203



X201  
BRIGHT

DIN EN 22568



## APPLICATION RANGE

| ISO | MG    | X201<br>BRIGHT |  |  |  |
|-----|-------|----------------|--|--|--|
| P   | P.1-4 | •              |  |  |  |
|     | P.7   | •              |  |  |  |
| M   | M.1   | •              |  |  |  |
| K   | K.2   | •              |  |  |  |
| N   | N.1-3 | •              |  |  |  |
|     | N.5-7 | •              |  |  |  |



«

| $\varnothing d_1$ | P    | $\varnothing d_2$ | h1   | z   | X201<br>BRIGHT<br>...D00000 |
|-------------------|------|-------------------|------|-----|-----------------------------|
| [mm]              | [mm] | [mm]              | [mm] | [-] |                             |
| M 18              | 1,5  | 45                | 14   | 5   | X20118150...                |
| 18                | 2    | 45                | 14   | 5   | X20118200...                |
| 20                | 1    | 45                | 14   | 6   | X20120100...                |
| 20                | 1,5  | 45                | 14   | 6   | X20120150...                |
| 20                | 2    | 45                | 14   | 6   | X20120200...                |
| 22                | 1    | 55                | 16   | 6   | X20122100...                |
| 22                | 1,5  | 55                | 16   | 6   | X20122150...                |
| 22                | 2    | 55                | 16   | 6   | X20122200...                |
| 24                | 1    | 55                | 16   | 6   | X20124100...                |
| 24                | 1,5  | 55                | 16   | 6   | X20124150...                |
| 24                | 2    | 55                | 16   | 6   | X20124200...                |
| 25                | 1    | 55                | 16   | 6   | X20125100...                |
| 25                | 1,5  | 55                | 16   | 6   | X20125150...                |
| 25                | 2    | 55                | 16   | 6   | X20125200...                |
| 26                | 1,5  | 55                | 16   | 6   | X20126150...                |
| 27                | 1,5  | 65                | 18   | 6   | X20127150...                |
| 27                | 2    | 65                | 18   | 6   | X20127200...                |
| 28                | 1,5  | 65                | 18   | 6   | X20128150...                |
| 28                | 2    | 65                | 18   | 6   | X20128200...                |
| 30                | 1    | 65                | 18   | 6   | X20130100...                |
| 30                | 1,5  | 65                | 18   | 6   | X20130150...                |
| 30                | 2    | 65                | 18   | 6   | X20130200...                |
| 32                | 1,5  | 65                | 18   | 7   | X20132150...                |
| 32                | 2    | 65                | 18   | 7   | X20132200...                |
| 33                | 2    | 65                | 18   | 7   | X20133200...                |
| 35                | 1,5  | 65                | 18   | 8   | X20135150...                |

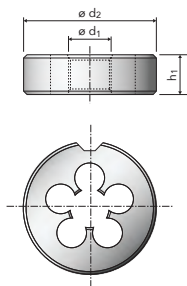
»



HSS

**X201**  
BRIGHT

## DIN EN 22568



## APPLICATION RANGE

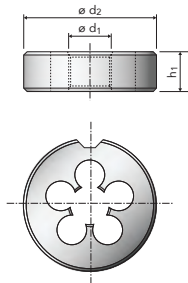
| ISO | MG    | X201<br>BRIGHT |  |  |  |
|-----|-------|----------------|--|--|--|
| P   | P.1-4 | ●              |  |  |  |
|     | P.7   | ●              |  |  |  |
| M   | M.1   | ●              |  |  |  |
| K   | K.2   | ●              |  |  |  |
| N   | N.1-3 | ●              |  |  |  |
|     | N.5-7 | ●              |  |  |  |

ISO  
6g



X204  
BRIGHT

DIN EN 22568



## APPLICATION RANGE

| ISO | MG    | X204<br>BRIGHT |  |  |  |
|-----|-------|----------------|--|--|--|
| P   | P.1-4 | •              |  |  |  |
|     | P.7   | •              |  |  |  |
| M   | M.1   | •              |  |  |  |
| K   | K.2   | •              |  |  |  |
| N   | N.1-3 | •              |  |  |  |
|     | N.5-7 | •              |  |  |  |

2A

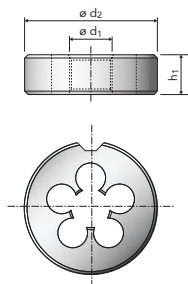


| UNC    | P     | Ød <sub>1</sub> | Ød <sub>2</sub> | h1   | z   | X204<br>BRIGHT<br>...D00000 |
|--------|-------|-----------------|-----------------|------|-----|-----------------------------|
|        | [TPI] | [mm]            | [mm]            | [mm] | [-] |                             |
| Nr. 2  | 56    | 2,184           | 16              | 5    | 3   | X204H0256...                |
| Nr. 4  | 40    | 2,845           | 20              | 5    | 3   | X204H0440...                |
| Nr. 5  | 40    | 3,175           | 20              | 5    | 4   | X204H0540...                |
| Nr. 6  | 32    | 3,505           | 20              | 7    | 4   | X204H0632...                |
| Nr. 8  | 32    | 4,166           | 20              | 7    | 4   | X204H0832...                |
| Nr. 10 | 24    | 4,826           | 20              | 7    | 4   | X204H1024...                |
| Nr. 12 | 24    | 5,486           | 20              | 7    | 4   | X204H1224...                |
| 1/4"   | 20    | 6,35            | 20              | 7    | 4   | X204HA140...                |
| 5/16"  | 18    | 7,938           | 25              | 9    | 4   | X204HB516...                |
| 3/8"   | 16    | 9,525           | 30              | 11   | 4   | X204HC380...                |
| 7/16"  | 14    | 11,113          | 30              | 11   | 4   | X204HD716...                |
| 1/2"   | 13    | 12,7            | 38              | 14   | 4   | X204HE120...                |
| 9/16"  | 12    | 14,288          | 38              | 14   | 4   | X204HF916...                |
| 5/8"   | 11    | 15,875          | 45              | 18   | 4   | X204HG580...                |
| 3/4"   | 10    | 19,05           | 45              | 18   | 5   | X204HH340...                |
| 7/8"   | 9     | 22,225          | 55              | 22   | 5   | X204HL780...                |
| 1"     | 8     | 25,4            | 55              | 22   | 5   | X204HM100...                |
|        |       |                 |                 |      |     |                             |
|        |       |                 |                 |      |     |                             |
|        |       |                 |                 |      |     |                             |
|        |       |                 |                 |      |     |                             |



**X205**  
BRIGHT

### DIN EN 22568



#### APPLICATION RANGE

| ISO | MG    | X205<br>BRIGHT |  |  |  |
|-----|-------|----------------|--|--|--|
| P   | P.1-4 | •              |  |  |  |
|     | P.7   | •              |  |  |  |
| M   | M.1   | •              |  |  |  |
| K   | K.2   | •              |  |  |  |
| N   | N.1-3 | •              |  |  |  |
|     | N.5-7 | •              |  |  |  |

2A



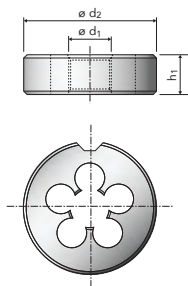
| UNF    | P     | $\varnothing d_1$ | $\varnothing d_2$ | h1   | z   | X205<br>BRIGHT<br>...D00000 |  |
|--------|-------|-------------------|-------------------|------|-----|-----------------------------|--|
|        | [TPI] | [mm]              | [mm]              | [mm] | [-] |                             |  |
| Nr. 3  | 56    | 2,515             | 16                | 5    | 3   | X205N0356...                |  |
| Nr. 4  | 48    | 2,845             | 20                | 5    | 3   | X205N0448...                |  |
| Nr. 5  | 44    | 3,175             | 20                | 5    | 3   | X205N0544...                |  |
| Nr. 6  | 40    | 3,505             | 20                | 5    | 4   | X205N0640...                |  |
| Nr. 8  | 36    | 4,166             | 20                | 7    | 4   | X205N0836...                |  |
| Nr. 10 | 32    | 4,826             | 20                | 7    | 4   | X205N1032...                |  |
| Nr. 12 | 28    | 5,486             | 20                | 7    | 4   | X205N1228...                |  |
| 1/4"   | 28    | 6,35              | 20                | 7    | 4   | X205NA140...                |  |
| 5/16"  | 24    | 7,938             | 25                | 9    | 4   | X205NB516...                |  |
| 3/8"   | 24    | 9,525             | 30                | 11   | 4   | X205NC380...                |  |
| 7/16"  | 20    | 11,113            | 30                | 11   | 5   | X205ND716...                |  |
| 1/2"   | 20    | 12,7              | 38                | 10   | 5   | X205NE120...                |  |
| 9/16"  | 18    | 14,288            | 38                | 10   | 5   | X205NF916...                |  |
| 5/8"   | 18    | 15,875            | 45                | 14   | 4   | X205NG580...                |  |
| 3/4"   | 16    | 19,05             | 45                | 14   | 6   | X205NH340...                |  |
| 7/8"   | 14    | 22,225            | 55                | 16   | 5   | X205NL780...                |  |
| 1"     | 12    | 25,4              | 55                | 16   | 6   | X205NM100...                |  |
|        |       |                   |                   |      |     |                             |  |
|        |       |                   |                   |      |     |                             |  |
|        |       |                   |                   |      |     |                             |  |
|        |       |                   |                   |      |     |                             |  |
|        |       |                   |                   |      |     |                             |  |



HSS

**X203**  
BRIGHT

DIN EN 24231



## APPLICATION RANGE

| ISO | MG    | X203<br>BRIGHT |  |  |  |
|-----|-------|----------------|--|--|--|
| P   | P.1-4 | ●              |  |  |  |
|     | P.7   | ●              |  |  |  |
| M   | M.1   | ●              |  |  |  |
| K   | K.2   | ●              |  |  |  |
| N   | N.1-3 | ●              |  |  |  |
|     | N.5-7 | ●              |  |  |  |

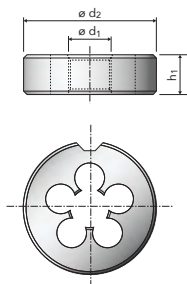
A

[illegible]



**X202**  
BRIGHT

## DIN EN 22568



## APPLICATION RANGE

| ISO | MG    | X202<br>BRIGHT |  |  |  |
|-----|-------|----------------|--|--|--|
| P   | P.1-4 | ●              |  |  |  |
|     | P.7   | ●              |  |  |  |
| M   | M.1   | ●              |  |  |  |
| K   | K.2   | ●              |  |  |  |
| N   | N.1-3 | ●              |  |  |  |
|     | N.5-7 | ●              |  |  |  |

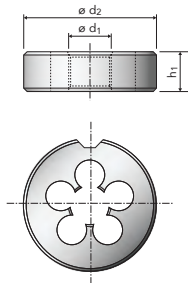
[illegible]



HSS

**X206**  
BRIGHT

DIN EN 22568



## APPLICATION RANGE

| ISO | MG    | X206<br>BRIGHT |  |  |  |
|-----|-------|----------------|--|--|--|
| P   | P.1-4 | ●              |  |  |  |
|     | P.7   | ●              |  |  |  |
| M   | M.1   | ●              |  |  |  |
| K   | K.2   | ●              |  |  |  |
| N   | N.1-3 | ●              |  |  |  |
|     | N.5-7 | ●              |  |  |  |

[illegible]



## VR SERIES

THREAD MILLS



## APPLICATION AND CUTTING SPEED TABLE

| VR10 - VR20 - VR30 |                     |       |                                                |             |             |                 |      |      |      |      |      |      |      |      |      |
|--------------------|---------------------|-------|------------------------------------------------|-------------|-------------|-----------------|------|------|------|------|------|------|------|------|------|
| ISO 513            | Material            | Group | Application                                    | N/mm²       | Vc<br>m/min | Feed (mm/tooth) |      |      |      |      |      |      |      |      |      |
|                    |                     |       |                                                |             |             | Ø2              | Ø3   | Ø4   | Ø6   | Ø8   | Ø10  | Ø12  | Ø14  | Ø16  | Ø20  |
| P                  | Steel               | P.1   | Mild / magnetic steel                          | 200 - 400   | 100-250     | 0,03            | 0,04 | 0,04 | 0,06 | 0,07 | 0,08 | 0,09 | 0,11 | 0,12 | 0,15 |
|                    |                     | P.2   | Construction steel,<br>case hardening steel    | 350 - 700   | 100-250     | 0,03            | 0,04 | 0,04 | 0,06 | 0,07 | 0,08 | 0,09 | 0,11 | 0,12 | 0,15 |
|                    |                     | P.3   | Carbon steel                                   | 350 - 850   | 100-250     | 0,03            | 0,04 | 0,04 | 0,06 | 0,07 | 0,08 | 0,09 | 0,11 | 0,12 | 0,15 |
|                    |                     | P.4   | Alloyed steel, tempered steel                  | 500 - 850   | 110-180     | 0,02            | 0,03 | 0,03 | 0,05 | 0,06 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 |
|                    |                     | P.5   | Alloyed steel, tempered steel                  | 850 - 1200  | 90-160      | 0,02            | 0,02 | 0,03 | 0,03 | 0,04 | 0,05 | 0,05 | 0,06 | 0,07 | 0,08 |
|                    |                     | P.6   | Alloyed steel /<br>high strength steel         | 1200 - 1600 | 90-140      | 0,02            | 0,02 | 0,02 | 0,02 | 0,03 | 0,04 | 0,04 | 0,05 | 0,06 | 0,07 |
|                    |                     | P.7   | Ferritic /<br>martensitic stainless steel      | < 1000      | 110-180     | 0,02            | 0,03 | 0,03 | 0,05 | 0,06 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 |
| M                  | Stainless<br>steel  | M.1   | Austenitic                                     | < 850       | 60-120      | 0,02            | 0,02 | 0,03 | 0,03 | 0,04 | 0,05 | 0,05 | 0,06 | 0,07 | 0,08 |
|                    |                     | M.2   | Ferritic-austenitic (Duplex)                   | < 1000      | 50-100      | 0,02            | 0,02 | 0,03 | 0,03 | 0,04 | 0,05 | 0,05 | 0,06 | 0,07 | 0,08 |
| K                  | Cast iron           | K.1   | Grey cast iron                                 | < 1000      | 70-150      | 0,03            | 0,04 | 0,04 | 0,06 | 0,07 | 0,08 | 0,09 | 0,11 | 0,12 | 0,15 |
|                    |                     | K.2   | Nodular cast iron                              | < 1000      | 100-250     | 0,03            | 0,04 | 0,04 | 0,06 | 0,07 | 0,08 | 0,09 | 0,11 | 0,12 | 0,15 |
|                    |                     | K.3   | Austempered ductile iron (ADI)                 | < 1400      | 70-120      | 0,03            | 0,03 | 0,03 | 0,04 | 0,05 | 0,06 | 0,07 | 0,08 | 0,09 | 0,1  |
| N                  | Aluminium<br>alloys | N.1   | Pure aluminium                                 | < 300       | 150-350     | 0,03            | 0,04 | 0,04 | 0,06 | 0,07 | 0,08 | 0,09 | 0,11 | 0,12 | 0,15 |
|                    |                     | N.2   | Aluminium alloys Si < 0,5%<br>(long chipping)  | < 500       | 150-350     | 0,03            | 0,04 | 0,04 | 0,06 | 0,07 | 0,08 | 0,09 | 0,11 | 0,12 | 0,15 |
|                    |                     | N.3   | Aluminium alloys Si < 10%<br>(medium chipping) | < 500       | 150-350     | 0,03            | 0,04 | 0,04 | 0,06 | 0,07 | 0,08 | 0,09 | 0,11 | 0,12 | 0,15 |
|                    |                     | N.4   | Aluminium alloys Si > 10%<br>(short chipping)  | < 600       | 100-250     | 0,02            | 0,02 | 0,03 | 0,03 | 0,04 | 0,05 | 0,05 | 0,06 | 0,07 | 0,08 |
|                    | Copper<br>alloys    | N.5   | Pure copper                                    | 250 - 350   | 150-350     | 0,03            | 0,04 | 0,04 | 0,06 | 0,07 | 0,08 | 0,09 | 0,11 | 0,12 | 0,15 |
|                    |                     | N.6   | Copper alloys, Brass<br>(long chipping)        | < 700       | 150-350     | 0,03            | 0,04 | 0,04 | 0,06 | 0,07 | 0,08 | 0,09 | 0,11 | 0,12 | 0,15 |
|                    |                     | N.7   | Copper alloys, Brass<br>(short chipping)       | < 700       | 100-250     | 0,02            | 0,02 | 0,03 | 0,03 | 0,04 | 0,05 | 0,05 | 0,06 | 0,07 | 0,08 |
|                    |                     | N.8   | High strength bronze                           | 700 - 1500  | 90-140      | 0,02            | 0,02 | 0,02 | 0,02 | 0,03 | 0,04 | 0,04 | 0,05 | 0,06 | 0,07 |
|                    | Magnesium<br>alloys | N.9   | Pure Magnesium /<br>Magnesium alloys           | 120 - 300   | 150-350     | 0,03            | 0,04 | 0,04 | 0,06 | 0,07 | 0,08 | 0,09 | 0,11 | 0,12 | 0,15 |
|                    |                     | N.10  | High strength Magnesium alloys                 | 240 - 400   | 150-350     | 0,03            | 0,04 | 0,04 | 0,06 | 0,07 | 0,08 | 0,09 | 0,11 | 0,12 | 0,15 |
| S                  | Titanium<br>alloys  | S.1   | Pure titanium                                  | 400 - 600   | 20-90       | 0,02            | 0,02 | 0,02 | 0,03 | 0,04 | 0,04 | 0,04 | 0,05 | 0,05 | 0,05 |
|                    |                     | S.2   | Titanium alloys                                | 600 - 1000  | 20-80       | 0,02            | 0,02 | 0,02 | 0,03 | 0,03 | 0,03 | 0,03 | 0,04 | 0,04 | 0,04 |
|                    | Nickel alloys       | S.3   | Pure nickel                                    | 400 - 600   | 20-90       | 0,02            | 0,02 | 0,02 | 0,03 | 0,04 | 0,04 | 0,04 | 0,05 | 0,05 | 0,05 |
|                    |                     | S.4   | Nickel alloys                                  | 600 - 1000  | 20-80       | 0,02            | 0,02 | 0,02 | 0,03 | 0,03 | 0,03 | 0,03 | 0,04 | 0,04 | 0,04 |

## APPLICATION AND CUTTING SPEED TABLE

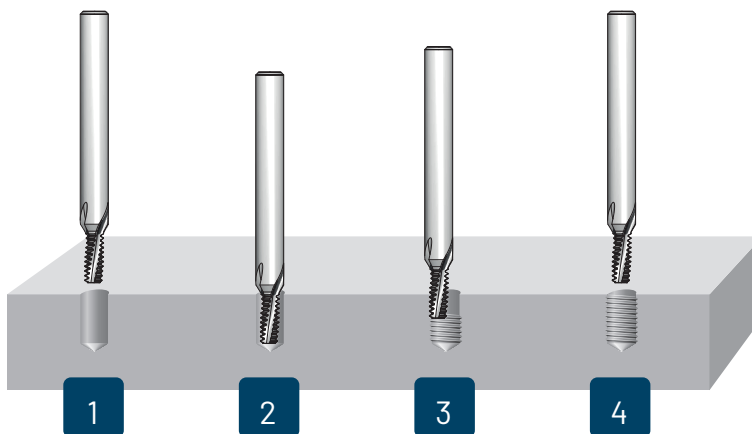
| VR40 - VR45 |                  |       |                                             |             |             |                 |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-------------|------------------|-------|---------------------------------------------|-------------|-------------|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| ISO 513     | Material         | Group | Application                                 | N/mm²       | Vc<br>m/min | Feed (mm/tooth) |      |      |      |      |      |      |      |      |      |      |      |      |      |
|             |                  |       |                                             |             |             | Ø1              | Ø1,5 | Ø2   | Ø3   | Ø4   | Ø5   | Ø6   | Ø7   | Ø8   | Ø9   | Ø10  | Ø12  | Ø14  | Ø16  |
| P           | Steel            | P.1   | Mild / magnetic steel                       | 200 - 400   | 60-120      | 0,04            | 0,05 | 0,05 | 0,07 | 0,09 | 0,11 | 0,13 | 0,14 | 0,15 | 0,16 | 0,16 | 0,17 | 0,18 | 0,18 |
|             |                  | P.2   | Construction steel, case hardening steel    | 350 - 700   | 60-120      | 0,04            | 0,05 | 0,05 | 0,07 | 0,09 | 0,11 | 0,13 | 0,14 | 0,15 | 0,16 | 0,16 | 0,17 | 0,18 | 0,18 |
|             |                  | P.3   | Carbon steel                                | 350 - 850   | 60-120      | 0,04            | 0,05 | 0,05 | 0,07 | 0,09 | 0,11 | 0,13 | 0,14 | 0,15 | 0,16 | 0,16 | 0,17 | 0,18 | 0,18 |
|             |                  | P.4   | Alloyed steel, tempered steel               | 500 - 850   | 60-90       | 0,03            | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  | 0,12 | 0,13 | 0,14 | 0,14 | 0,16 | 0,17 | 0,18 |
|             |                  | P.5   | Alloyed steel, tempered steel               | 850 - 1200  | 50-80       | 0,03            | 0,04 | 0,04 | 0,05 | 0,05 | 0,06 | 0,07 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 | 0,13 | 0,14 |
|             |                  | P.6   | Alloyed steel / high strength steel         | 1200 - 1600 | 50-70       | 0,02            | 0,02 | 0,02 | 0,03 | 0,04 | 0,05 | 0,06 | 0,06 | 0,07 | 0,08 | 0,09 | 0,1  | 0,12 | 0,13 |
|             |                  | P.7   | Ferritic / martensitic stainless steel      | < 1000      | 60-90       | 0,03            | 0,04 | 0,05 | 0,06 | 0,08 | 0,09 | 0,1  | 0,12 | 0,13 | 0,14 | 0,14 | 0,16 | 0,17 | 0,18 |
| M           | Stainless steel  | M.1   | Austenitic                                  | < 850       | 60-90       | 0,02            | 0,03 | 0,03 | 0,04 | 0,05 | 0,06 | 0,06 | 0,07 | 0,08 | 0,09 | 0,1  | 0,11 | 0,12 | 0,13 |
|             |                  | M.2   | Ferritic-austenitic (Duplex)                | < 1000      | 50-80       | 0,02            | 0,03 | 0,03 | 0,04 | 0,05 | 0,06 | 0,06 | 0,07 | 0,08 | 0,09 | 0,1  | 0,11 | 0,12 | 0,13 |
| K           | Cast iron        | K.1   | Grey cast iron                              | < 1000      | 40-80       | 0,04            | 0,05 | 0,05 | 0,07 | 0,09 | 0,11 | 0,13 | 0,14 | 0,15 | 0,16 | 0,16 | 0,17 | 0,18 | 0,18 |
|             |                  | K.2   | Nodular cast iron                           | < 1000      | 60-120      | 0,04            | 0,05 | 0,05 | 0,07 | 0,09 | 0,11 | 0,13 | 0,14 | 0,15 | 0,16 | 0,16 | 0,17 | 0,18 | 0,18 |
|             |                  | K.3   | Austempered ductile iron (ADI)              | < 1400      | 40-70       | 0,04            | 0,04 | 0,04 | 0,05 | 0,05 | 0,06 | 0,07 | 0,08 | 0,09 | 0,1  | 0,11 | 0,12 | 0,12 | 0,12 |
| N           | Aluminium alloys | N.1   | Pure aluminium                              | < 300       | 100-200     | 0,04            | 0,05 | 0,05 | 0,07 | 0,09 | 0,11 | 0,13 | 0,14 | 0,15 | 0,16 | 0,16 | 0,17 | 0,18 | 0,18 |
|             |                  | N.2   | Aluminium alloys Si < 0,5% (long chipping)  | < 500       | 100-200     | 0,04            | 0,05 | 0,05 | 0,07 | 0,09 | 0,11 | 0,13 | 0,14 | 0,15 | 0,16 | 0,16 | 0,17 | 0,18 | 0,18 |
|             |                  | N.3   | Aluminium alloys Si < 10% (medium chipping) | < 500       | 100-200     | 0,04            | 0,05 | 0,05 | 0,07 | 0,09 | 0,11 | 0,13 | 0,14 | 0,15 | 0,16 | 0,16 | 0,17 | 0,18 | 0,18 |
|             |                  | N.4   | Aluminium alloys Si > 10% (short chipping)  | < 600       | 60-140      | 0,03            | 0,03 | 0,03 | 0,04 | 0,05 | 0,06 | 0,06 | 0,07 | 0,08 | 0,09 | 0,1  | 0,11 | 0,13 | 0,14 |
|             | Copper alloys    | N.5   | Pure copper                                 | 250 - 350   | 100-200     | 0,04            | 0,05 | 0,05 | 0,07 | 0,09 | 0,11 | 0,13 | 0,14 | 0,15 | 0,16 | 0,16 | 0,17 | 0,18 | 0,18 |
|             |                  | N.6   | Copper alloys, Brass (long chipping)        | < 700       | 100-200     | 0,04            | 0,05 | 0,05 | 0,07 | 0,09 | 0,11 | 0,13 | 0,14 | 0,15 | 0,16 | 0,16 | 0,17 | 0,18 | 0,18 |
|             |                  | N.7   | Copper alloys, Brass (short chipping)       | < 700       | 60-140      | 0,03            | 0,03 | 0,03 | 0,04 | 0,05 | 0,06 | 0,06 | 0,07 | 0,08 | 0,09 | 0,1  | 0,11 | 0,13 | 0,14 |
|             |                  | N.8   | High strength bronze                        | 700 - 1500  | 60-100      | 0,03            | 0,03 | 0,03 | 0,03 | 0,04 | 0,04 | 0,05 | 0,05 | 0,06 | 0,08 | 0,08 | 0,09 | 0,09 | 0,1  |
|             | Magnesium alloys | N.9   | Pure Magnesium / Magnesium alloys           | 120 - 300   | 100-200     | 0,04            | 0,05 | 0,05 | 0,07 | 0,09 | 0,11 | 0,13 | 0,14 | 0,15 | 0,16 | 0,16 | 0,17 | 0,18 | 0,18 |
|             |                  | N.10  | High strength Magnesium alloys              | 240 - 400   | 100-200     | 0,04            | 0,05 | 0,05 | 0,07 | 0,09 | 0,11 | 0,13 | 0,14 | 0,15 | 0,16 | 0,16 | 0,17 | 0,18 | 0,18 |
| S           | Titanium alloys  | S.1   | Pure titanium                               | 400 - 600   | 20-50       | 0,03            | 0,03 | 0,03 | 0,04 | 0,05 | 0,06 | 0,06 | 0,06 | 0,07 | 0,07 | 0,08 | 0,08 | 0,08 | 0,08 |
|             |                  | S.2   | Titanium alloys                             | 600 - 1000  | 20-40       | 0,03            | 0,03 | 0,03 | 0,04 | 0,04 | 0,05 | 0,06 | 0,06 | 0,06 | 0,07 | 0,07 | 0,07 | 0,08 | 0,08 |
|             | Nickel alloys    | S.3   | Pure nickel                                 | 400 - 600   | 20-50       | 0,03            | 0,03 | 0,03 | 0,04 | 0,05 | 0,06 | 0,06 | 0,06 | 0,07 | 0,07 | 0,08 | 0,08 | 0,08 | 0,08 |
|             |                  | S.4   | Nickel alloys                               | 600 - 1000  | 20-40       | 0,03            | 0,03 | 0,03 | 0,04 | 0,04 | 0,05 | 0,06 | 0,06 | 0,06 | 0,07 | 0,07 | 0,07 | 0,08 | 0,08 |

## APPLICATION AND CUTTING SPEED TABLE

| VR50 - VR55 |                    |       |                                   |            |             |                 |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-------------|--------------------|-------|-----------------------------------|------------|-------------|-----------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| ISO 513     | Material           | Group | Application                       | N/mm²      | Vc<br>m/min | Feed (mm/tooth) |      |      |      |      |      |      |      |      |      |      |      |      |      |
|             |                    |       |                                   |            |             | Ø1              | Ø1,5 | Ø2   | Ø3   | Ø4   | Ø5   | Ø6   | Ø7   | Ø8   | Ø9   | Ø10  | Ø12  | Ø14  | Ø16  |
| <b>S</b>    | Titanium alloys    | S.2   | Titanium alloys                   | 600 - 1000 | 20-40       | 0,03            | 0,03 | 0,03 | 0,04 | 0,04 | 0,05 | 0,06 | 0,06 | 0,06 | 0,07 | 0,07 | 0,07 | 0,08 | 0,08 |
|             | Nickel alloys      | S.4   | Nickel alloys                     | 600 - 1000 | 20-40       | 0,03            | 0,03 | 0,03 | 0,04 | 0,04 | 0,05 | 0,06 | 0,06 | 0,06 | 0,07 | 0,07 | 0,07 | 0,08 | 0,08 |
| <b>H</b>    | Hardened materials | H.1   | Alloyed steel, hardness HRC 44-55 | -          | 50-60       | 0,02            | 0,03 | 0,03 | 0,04 | 0,04 | 0,05 | 0,05 | 0,06 | 0,06 | 0,07 | 0,07 | 0,08 | 0,09 | 0,1  |
|             |                    | H.2   | Alloyed steel, hardness HRC 56-62 | -          | 40-50       | 0,01            | 0,02 | 0,02 | 0,03 | 0,03 | 0,04 | 0,05 | 0,05 | 0,06 | 0,06 | 0,06 | 0,07 | 0,08 | 0,09 |

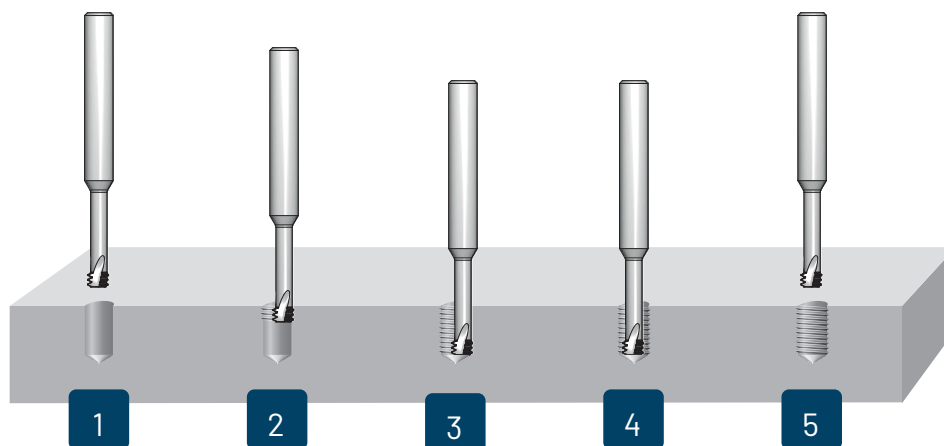
## PROCESS DESCRIPTION

### VR10 - VR20 - VR30



- 1 Start point - center position
- 2 Axial movement down to required thread depth, then 45° arc entrance
- 3 Thread milling (360°)
- 4 45° arc exit, then axial movement to start point

### VR40 - VR45 - VR50 - VR55



- 1 Start point - center position
- 2 45° arc entrance
- 3 Thread milling to required thread depth
- 4 45° arc exit
- 5 Axial movement to start point

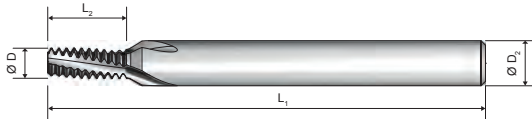
INT

HM

**VR10**  
TiAlN

**VR20**  
TiAlN

**VR30**  
TiAlN



#### APPLICATION RANGE

| ISO | VR10<br>TiAlN | VR20<br>TiAlN | VR30<br>TiAlN |
|-----|---------------|---------------|---------------|
| P   | •             | •             | •             |
| M   | •             | •             | •             |
| K   | •             | •             | •             |
| N   | •             | •             | •             |
| S   | •             | •             | •             |

For cutting data see page 212



INT

INT

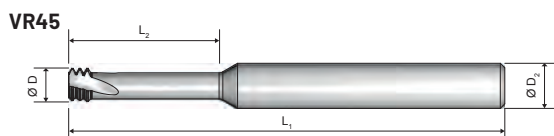
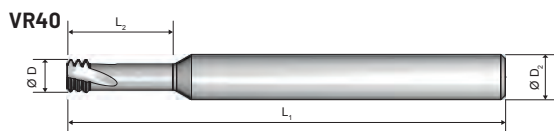
INT



| P    | M     | MF       | ØD <sub>2</sub><br>h6 | ØD   | z   | L <sub>2</sub> | L <sub>1</sub> | VR10<br>TiAlN   | VR20<br>TiAlN   | VR30<br>TiAlN   |
|------|-------|----------|-----------------------|------|-----|----------------|----------------|-----------------|-----------------|-----------------|
| [mm] |       |          | [mm]                  | [mm] | [-] | [mm]           | [mm]           |                 |                 |                 |
| 0,5  |       | M5x0,5   | 6                     | 3,8  | 3   | 10,3           | 58             | VR10038I0501000 |                 |                 |
| 0,7  | M4    |          | 6                     | 3,1  | 3   | 7,4            | 58             | VR10031I0700700 | VR20031I0700700 |                 |
| 0,75 |       | M6x0,75  | 6                     | 4,5  | 3   | 10,1           | 58             |                 | VR20045I0751000 |                 |
| 0,8  | M5    |          | 6                     | 3,6  | 3   | 9,2            | 58             | VR10036I0800900 | VR20036I0800900 |                 |
| 1    | M6    |          | 6                     | 4    | 3   | 10,5           | 58             | VR10040I1001000 |                 |                 |
| 1    | M6    |          | 6                     | 4    | 3   | 14,5           | 58             | VR10040I1001400 |                 |                 |
| 1    | M6    |          | 6                     | 4,8  | 3   | 10,5           | 58             |                 |                 | VR30048I1001000 |
| 1    | M6/M7 |          | 6                     | 4,6  | 3   | 14,5           | 58             |                 | VR20046I1001400 |                 |
| 1    |       | M10x1    | 8                     | 8    | 4   | 16,5           | 64             | VR10080I1001600 | VR20080I1001600 | VR30080I1001600 |
| 1    |       | M12x1    | 10                    | 10   | 4   | 24,5           | 73             |                 | VR20100I1002400 |                 |
| 1,25 | M8    | M10x1,25 | 6                     | 5    | 3   | 14,4           | 58             | VR10050I1251400 |                 |                 |
| 1,25 | M8    | M10x1,25 | 6                     | 6    | 3   | 14,4           | 58             |                 | VR20060I1251400 |                 |
| 1,25 | M8    | M10x1,25 | 6                     | 5    | 3   | 19,4           | 58             | VR10050I1251900 |                 |                 |
| 1,25 | M8    | M10x1,25 | 6                     | 6    | 3   | 19,4           | 58             |                 | VR20060I1251900 | VR30060I1251900 |
| 1,5  | M10   | M12x1,5  | 8                     | 7    | 3   | 17,3           | 64             | VR10070I1501700 |                 |                 |
| 1,5  | M10   | M12x1,5  | 8                     | 7    | 3   | 24,8           | 76             | VR10070I1502400 |                 |                 |
| 1,5  | M10   | M12x1,5  | 8                     | 7,8  | 3   | 17             | 64             |                 | VR20078I1501700 | VR30078I1501700 |
| 1,5  |       | M14x1,5  | 10                    | 10   | 4   | 21,8           | 73             | VR10100I1502100 |                 | VR30100I1502100 |
| 1,5  |       | M16x1,5  | 12                    | 12   | 4   | 26,3           | 84             |                 | VR20120I1502600 | VR30120I1502600 |
| 1,75 | M12   |          | 8                     | 8    | 3   | 20,1           | 64             | VR10080I1752000 |                 |                 |
| 1,75 | M12   |          | 10                    | 9    | 3   | 20,1           | 73             |                 | VR20090I1752000 |                 |
| 2    | M16   |          | 12                    | 11,8 | 4   | 27             | 84             |                 | VR20118I2002700 |                 |
| 2,5  | M20   |          | 16                    | 15   | 5   | 48,8           | 105            |                 | VR20150I2504800 |                 |
| 3    | M24   |          | 20                    | 18   | 4   | 58,5           | 120            |                 | VR20180I3005800 |                 |

INT

HM

VR40  
TiAlNVR45  
TiAlN

INT

INT



## APPLICATION RANGE

| ISO | VR40<br>TiAlN | VR45<br>TiAlN |  |
|-----|---------------|---------------|--|
| P   | •             | •             |  |
| M   | •             | •             |  |
| K   | •             | •             |  |
| N   | •             | •             |  |
| S   | •             | •             |  |

For cutting data see page 213

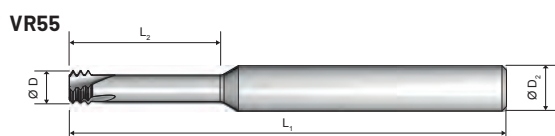
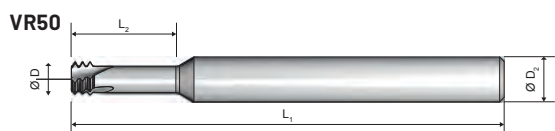
| P    | M    | ØD <sub>2</sub><br>h6 | ØD   | z   | L <sub>2</sub> | L <sub>1</sub> | VR40<br>TiAlN   | VR45<br>TiAlN   |  |
|------|------|-----------------------|------|-----|----------------|----------------|-----------------|-----------------|--|
| [mm] |      | [mm]                  | [mm] | [-] | [mm]           | [mm]           |                 |                 |  |
| 0,3  | M1,4 | 3                     | 1,05 | 3   | 4              | 39             |                 | VR4501010300400 |  |
| 0,35 | M1,6 | 3                     | 1,2  | 3   | 4,8            | 39             |                 | VR4501210350400 |  |
| 0,4  | M2   | 6                     | 1,53 | 3   | 4,5            | 58             | VR4001510400400 |                 |  |
| 0,4  | M2   | 3                     | 1,53 | 3   | 6              | 39             |                 | VR4501510400600 |  |
| 0,5  | M3   | 6                     | 2,37 | 3   | 6,5            | 58             | VR4002310500600 |                 |  |
| 0,5  | M3   | 6                     | 2,37 | 3   | 9,5            | 58             |                 | VR4502310500900 |  |
| 0,5  | M3   | 6                     | 2,37 | 3   | 9,5            | 105            |                 | VR450231050090L |  |
| 0,7  | M4   | 6                     | 3,1  | 3   | 9              | 58             | VR4003110700900 |                 |  |
| 0,7  | M4   | 6                     | 3,1  | 3   | 12,5           | 58             |                 | VR4503110701200 |  |
| 0,7  | M4   | 6                     | 3,1  | 3   | 12,5           | 105            |                 | VR450311070120L |  |
| 0,8  | M5   | 6                     | 3,8  | 3   | 12,5           | 58             | VR4003810801200 |                 |  |
| 0,8  | M5   | 6                     | 3,8  | 3   | 16             | 58             |                 | VR4503810801600 |  |
| 0,8  | M5   | 6                     | 3,8  | 3   | 16             | 105            |                 | VR450381080160L |  |
| 1    | M6   | 6                     | 4,65 | 3   | 14             | 58             | VR4004611001400 |                 |  |
| 1    | M6   | 6                     | 4,65 | 3   | 20             | 58             |                 | VR4504611002000 |  |
| 1    | M6   | 6                     | 4,65 | 3   | 20             | 105            |                 | VR450461100200L |  |
| 1,25 | M8   | 6                     | 5,95 | 3   | 18             | 58             | VR4005911251800 |                 |  |
| 1,25 | M8   | 6                     | 6    | 3   | 24             | 58             |                 | VR4506011252400 |  |
| 1,5  | M10  | 8                     | 7,8  | 3   | 23             | 64             | VR4007811502300 |                 |  |
| 1,75 | M12  | 10                    | 9    | 3   | 26             | 73             | VR4009011752600 |                 |  |
| 2    | M16  | 12                    | 11,8 | 4   | 35             | 84             | VR4011812003500 |                 |  |
|      |      |                       |      |     |                |                |                 |                 |  |
|      |      |                       |      |     |                |                |                 |                 |  |

INT

HM

**VR50**  
TiAlN

**VR55**  
TiAlN



## APPLICATION RANGE

| ISO | VR50<br>TiAlN | VR55<br>TiAlN |  |
|-----|---------------|---------------|--|
| S   | ●             | ●             |  |
| H   | ●             | ●             |  |

For cutting data see page 214

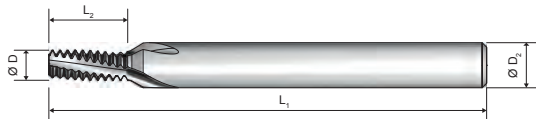
INT

INT

[illegible]

INT

HM

VR10  
TiAlNVR20  
TiAlN

INT

INT



## APPLICATION RANGE

| ISO | VR10<br>TiAlN | VR20<br>TiAlN |  |
|-----|---------------|---------------|--|
| P   | •             | •             |  |
| M   | •             | •             |  |
| K   | •             | •             |  |
| N   | •             | •             |  |
| S   | •             | •             |  |

For cutting data see page 212

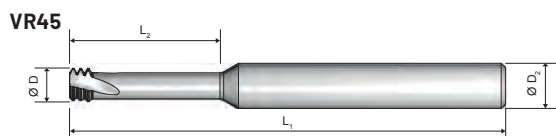
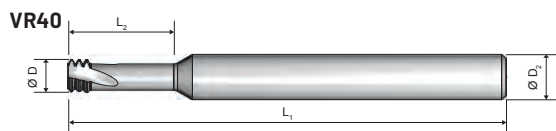
| P (Sp/1") | UNC   | UNF        | ØD <sub>2</sub><br>h6<br>[mm] | ØD<br>[mm] | z<br>[-] | L <sub>2</sub><br>[mm] | L <sub>1</sub><br>[mm] | VR10<br>TiAlN   | VR20<br>TiAlN   |  |
|-----------|-------|------------|-------------------------------|------------|----------|------------------------|------------------------|-----------------|-----------------|--|
| 28        |       | 1/4"       | 6                             | 4          | 3        | 11,3                   | 58                     | VR10040U28T1100 |                 |  |
| 28        |       | 1/4"       | 6                             | 5          | 3        | 11,3                   | 58                     |                 | VR20050U28T1100 |  |
| 24        |       | 5/16"      | 6                             | 5          | 3        | 14,3                   | 58                     | VR10050U24T1400 |                 |  |
| 24        |       | 3/8"       | 8                             | 7          | 3        | 20,6                   | 64                     | VR10070U24T2000 |                 |  |
| 24        |       | 5/16"      | 8                             | 6,6        | 3        | 14,3                   | 64                     |                 | VR20066U24T1400 |  |
| 24        |       | 3/8"       | 8                             | 8          | 4        | 20,6                   | 64                     |                 | VR20080U24T2000 |  |
| 20        | 1/4"  |            | 6                             | 4,5        | 3        | 12,1                   | 58                     | VR10045U20T1200 |                 |  |
| 20        |       | 7/16"-1/2" | 8                             | 7          | 3        | 21                     | 64                     | VR10070U20T2100 |                 |  |
| 20        | 1/4"  |            | 6                             | 4,7        | 3        | 12,1                   | 58                     |                 | VR20047U20T1200 |  |
| 20        |       | 7/16"      | 8                             | 8          | 3        | 21                     | 64                     |                 | VR20080U20T2100 |  |
| 20        |       | 1/2"       | 10                            | 10         | 4        | 22,3                   | 73                     |                 | VR20100U20T2200 |  |
| 18        | 5/16" |            | 6                             | 5          | 3        | 14,8                   | 58                     | VR10050U18T1400 |                 |  |
| 18        | 5/16" |            | 6                             | 5,6        | 3        | 14,8                   | 58                     |                 | VR20056U18T1400 |  |
| 16        | 3/8"  |            | 6                             | 6          | 3        | 16,7                   | 58                     | VR10060U16T1600 |                 |  |
| 16        | 3/8"  |            | 8                             | 6,7        | 3        | 16,7                   | 64                     |                 | VR20067U16T1600 |  |
| 14        | 7/16" |            | 8                             | 7          | 3        | 20,9                   | 64                     | VR10070U14T2000 |                 |  |
| 14        | 7/16" |            | 8                             | 7,7        | 3        | 20,9                   | 64                     |                 | VR20077U14T2000 |  |
| 13        | 1/2"  |            | 8                             | 8          | 3        | 22,5                   | 64                     | VR10080U13T2200 |                 |  |
| 13        | 1/2"  |            | 10                            | 9,2        | 3        | 22,5                   | 73                     |                 | VR20092U13T2200 |  |
| 11        | 5/8"  |            | 10                            | 10         | 3        | 28,9                   | 73                     | VR10100U11T2800 |                 |  |
| 11        | 5/8"  |            | 12                            | 11,4       | 3        | 28,9                   | 84                     |                 | VR20114U11T2800 |  |
|           |       |            |                               |            |          |                        |                        |                 |                 |  |
|           |       |            |                               |            |          |                        |                        |                 |                 |  |

INT

HM

**VR40**  
TiAlN

**VR45**  
TiAlN



## APPLICATION RANGE

| ISO | VR40<br>TiAIN | VR45<br>TiAIN |  |
|-----|---------------|---------------|--|
| P   | ●             | ●             |  |
| M   | ●             | ●             |  |
| K   | ●             | ●             |  |
| N   | ●             | ●             |  |
| S   | ●             | ●             |  |

For cutting data see page 213

INT

INT



RH

RH

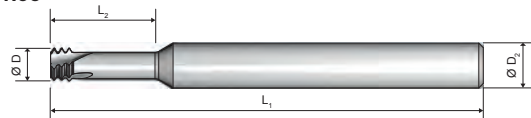
[illegible]

INT

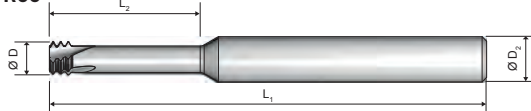
HM

VR50  
TiAlNVR55  
TiAlN

VR50



VR55



## APPLICATION RANGE

| ISO | VR50<br>TiAlN | VR55<br>TiAlN |  |
|-----|---------------|---------------|--|
| S   | •             | •             |  |
| H   | •             | •             |  |

For cutting data see page 214

INT

INT



| P (Sp/1") | UNC   | UNF        | ØD <sub>2</sub><br>h6<br>[mm] | ØD<br>[mm] | z | L <sub>2</sub><br>[mm] | L <sub>1</sub><br>[mm] | VR50<br>TiAlN   | VR55<br>TiAlN   |  |
|-----------|-------|------------|-------------------------------|------------|---|------------------------|------------------------|-----------------|-----------------|--|
| 28        |       | 1/4"       | 6                             | 5          | 3 | 14,5                   | 58                     | VR50050U28T1400 |                 |  |
| 28        |       | 1/4"       | 6                             | 5          | 3 | 19                     | 58                     |                 | VR55050U28T1900 |  |
| 24        |       | 5/16"-3/8" | 8                             | 6,6        | 3 | 17                     | 64                     | VR50066U24T1700 |                 |  |
| 24        |       | 5/16"-3/8" | 8                             | 6,6        | 3 | 24                     | 64                     |                 | VR55066U24T2400 |  |
| 20        | 1/4"  |            | 6                             | 4,75       | 3 | 14                     | 58                     | VR50047U20T1400 |                 |  |
| 20        |       | 7/16"      | 8                             | 8          | 3 | 25                     | 64                     | VR50080U20T2500 |                 |  |
| 20        | 1/4"  |            | 6                             | 4,75       | 3 | 19                     | 58                     |                 | VR55047U20T1900 |  |
| 18        | 5/16" |            | 6                             | 6          | 3 | 17                     | 58                     | VR50060U18T1700 |                 |  |
| 18        |       | 5/8"       | 12                            | 12         | 4 | 35                     | 84                     | VR50012U18T3500 |                 |  |
| 18        | 5/16" |            | 6                             | 6          | 3 | 23                     | 58                     |                 | VR55060U18T2300 |  |
| 16        | 3/8"  |            | 8                             | 6,7        | 3 | 22                     | 64                     | VR50067U16T2200 |                 |  |
| 14        | 7/16" |            | 8                             | 7,7        | 3 | 25                     | 64                     | VR50077U14T2500 |                 |  |
| 13        | 1/2"  |            | 10                            | 9,2        | 3 | 27,5                   | 73                     | VR50092U13T2700 |                 |  |
| 11        | 5/8"  |            | 12                            | 11,4       | 3 | 34,5                   | 84                     | VR50114U11T3400 |                 |  |
|           |       |            |                               |            |   |                        |                        |                 |                 |  |
|           |       |            |                               |            |   |                        |                        |                 |                 |  |
|           |       |            |                               |            |   |                        |                        |                 |                 |  |
|           |       |            |                               |            |   |                        |                        |                 |                 |  |
|           |       |            |                               |            |   |                        |                        |                 |                 |  |
|           |       |            |                               |            |   |                        |                        |                 |                 |  |
|           |       |            |                               |            |   |                        |                        |                 |                 |  |
|           |       |            |                               |            |   |                        |                        |                 |                 |  |
|           |       |            |                               |            |   |                        |                        |                 |                 |  |
|           |       |            |                               |            |   |                        |                        |                 |                 |  |

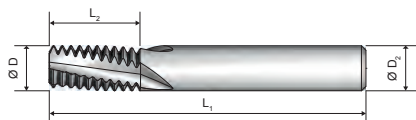
INT

EXT

HM

**VR10**  
TiAlN

**VR20**  
TiAlN



## APPLICATION RANGE

| ISO | VR10<br>TiAIN | VR20<br>TiAIN |  |
|-----|---------------|---------------|--|
| P   | ●             | ●             |  |
| M   | ●             | ●             |  |
| K   | ●             | ●             |  |
| N   | ●             | ●             |  |
| S   | ●             | ●             |  |

For cutting data see page 212

INT

EXT

INT

EXT

[illegible]





## VA SERIES

SYNCHRONOUS TAPPING ATTACHMENTS



# TAPPING ATTACHMENTS

Vergnano Sincro synchronous tapping attachments are specifically designed to enhance the performance of the Vergnano S-Series taps for synchronous tapping processes.

## Synchronous Tapping Attachments

In modern CNC machine tools with synchronous spindles, the rotational and axial movements of the spindle are coordinated by the numeric control of the machine. On these modern machine tools standard compensated tapping attachments are not recommended since the large compensation in extension can negatively influence the performance of the tool. Vergnano Sincro synchronous tapping attachments are specifically designed for synchronous tapping: micro-compensation reduces the axial and radial forces generated during the tapping process and enhances tool life. Since machine, tapping attachment and tool are synchronised it is possible to reach high machining speeds. This advantage, together with increased tool life, leads to improved productivity.

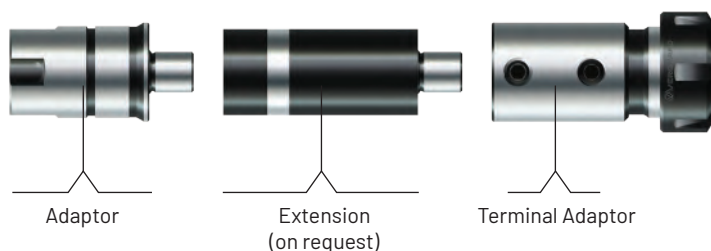
## Quick-Change System

Vergnano offers a new system consisting in tapping attachment and quick-change adaptor which allows worn tools to be substituted without changing the entire tapping attachment thereby saving precious machining time.

It is recommended to have a second quick-change adaptor (in addition to that delivered with the tapping attachment) sold separately to exploit this advantage.

Also available are extended quick-change adaptors which permit extension of the tapping attachment in order to reach threads in difficult positions.

This versatile and cost-saving system covers a wide range of applications with just one tapping attachment.

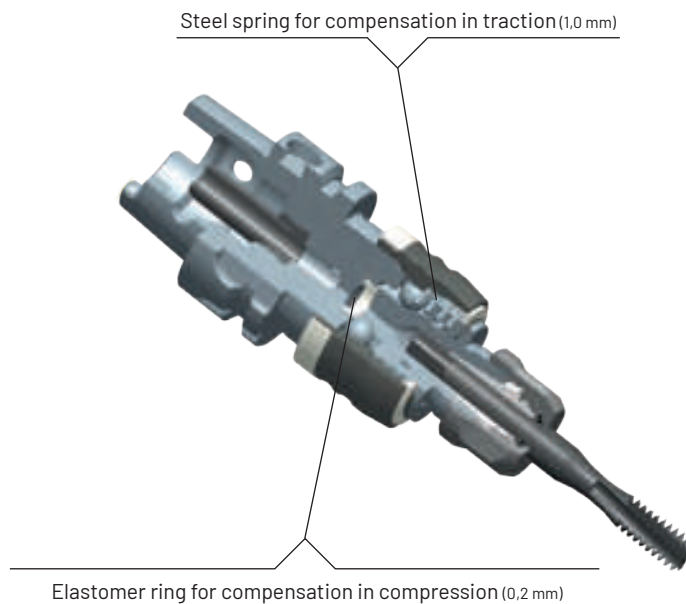


The extended adapter is sold assembled and consists of two parts (adaptor and terminal adaptor). Further extensions are available on request.

## Micro-Compensation

During tap reversal high axial forces are generated on the tap which cause mechanical stresses and micro-wear. This in turn leads to reduced tool life and tool precision. For this reason Vergnano synchronous tapping attachments are designed with differential micro-compensation in traction and compression which compensates the stresses on the tap.

Compensation in traction (1 mm) is obtained by steel springs which guarantee greater reliability while compensation in compression (0,2 mm) is obtained by elastomer rings.



## Through Coolant Capability

All Vergnano synchronous tapping attachments are designed for use with internal lubrication up to 50 bars. For higher values a special pressure-tight nut screw is available on request.

The special attachment design forces the through coolant to enter the tap adaptor from the sides without interfering with the compensation length.

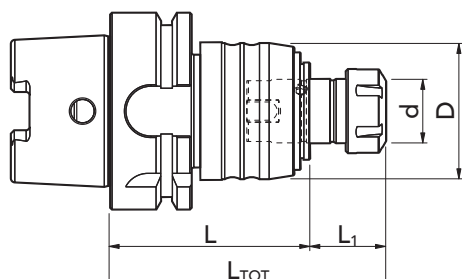


## SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR

With internal through coolant capability (1)



DIN 69893 HSK A



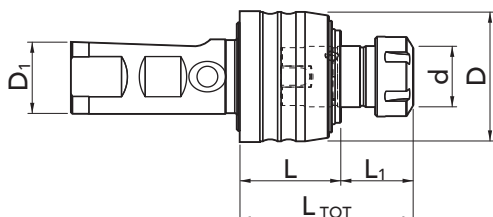
| Article Code    | Attachment | Tap Size  | L<br>[mm] | ø D<br>[mm] | ø d<br>[mm] | ER collet | L <sub>1</sub><br>[mm] | L <sub>TOT</sub><br>[mm] |
|-----------------|------------|-----------|-----------|-------------|-------------|-----------|------------------------|--------------------------|
| VA01A06302CH160 | HSK-A63    | M3 - M8   | 64        | 43          | 20          | ER 16     | 20,5                   | 84,5                     |
| VA01A06302CH250 | HSK-A63    | M6 - M20  | 97        | 60          | 32          | ER 25     | 23,5                   | 120,5                    |
| VA01A10002CH400 | HSK-A100   | M14 - M33 | 115       | 87          | 50          | ER 40     | 28,5                   | 143,5                    |

## SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR

With internal through coolant capability (1)



DIN 1835 B+E



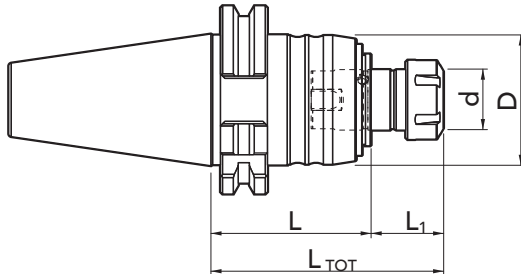
| Article Code    | Attachment<br>ø D <sub>1</sub> [mm] | Tap Size  | L<br>[mm] | ø D<br>[mm] | ø d<br>[mm] | ER collet | L <sub>1</sub><br>[mm] | L <sub>TOT</sub><br>[mm] |
|-----------------|-------------------------------------|-----------|-----------|-------------|-------------|-----------|------------------------|--------------------------|
| VA01C02502CH160 | 25                                  | M3 - M8   | 34        | 43          | 20          | ER 16     | 20,5                   | 54,5                     |
| VA01C02502CH250 | 25                                  | M6 - M20  | 56        | 60          | 32          | ER 25     | 23,5                   | 79,5                     |
| VA01C04002CH400 | 40                                  | M14 - M33 | 80        | 87          | 50          | ER 40     | 28,5                   | 108,5                    |

(1) For coolant pressure above 50 bars a special nut screw is available on request

# SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR With internal through coolant capability (1)



SK DIN 69871 AD

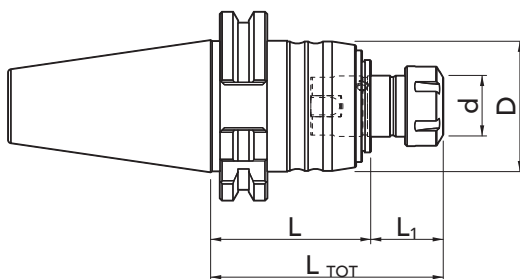


| Article Code    | Attachment | Tap Size | L<br>[mm] | ø D<br>[mm] | ø d<br>[mm] | ER collet | L <sub>1</sub><br>[mm] | L <sub>TOT</sub><br>[mm] |
|-----------------|------------|----------|-----------|-------------|-------------|-----------|------------------------|--------------------------|
| VA01B04002CH160 | SK 40 AD   | M3 - M8  | 53        | 43          | 20          | ER 16     | 20,5                   | 73,5                     |
| VA01B05002CH160 | SK 50 AD   | M3 - M8  | 53        | 43          | 20          | ER 16     | 20,5                   | 73,5                     |
| VA01B04002CH250 | SK 40 AD   | M6 - M20 | 90        | 60          | 32          | ER 25     | 23,5                   | 113,5                    |
| VA01B05002CH250 | SK 50 AD   | M6 - M20 | 74        | 60          | 32          | ER 25     | 23,5                   | 97,5                     |

# SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR With internal through coolant capability (1)



SK DIN 69871 AD+B



| Article Code    | Attachment | Tap Size  | L<br>[mm] | ø D<br>[mm] | ø d<br>[mm] | ER collet | L <sub>1</sub><br>[mm] | L <sub>TOT</sub><br>[mm] |
|-----------------|------------|-----------|-----------|-------------|-------------|-----------|------------------------|--------------------------|
| VA01B05002CH400 | SK 50 B    | M14 - M33 | 115       | 87          | 50          | ER 40     | 28,5                   | 143,5                    |

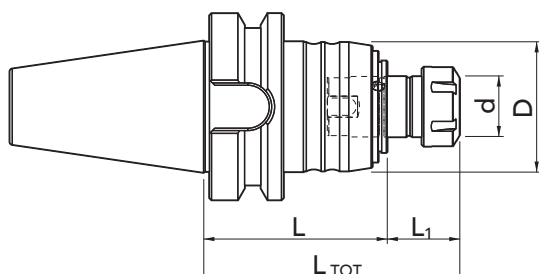
(1) For coolant pressure above 50 bars a special nut screw is available on request

## SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR

With internal through coolant capability (1)



MAS 403 BT



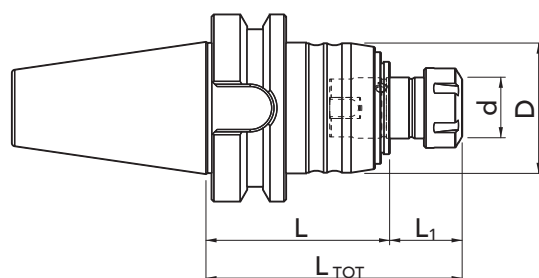
| Article Code    | Attachment | Tap Size | L    | ø D  | ø d  | ER collet | L <sub>1</sub> | L <sub>TOT</sub> |
|-----------------|------------|----------|------|------|------|-----------|----------------|------------------|
|                 |            |          | [mm] | [mm] | [mm] |           | [mm]           | [mm]             |
| VA01M04002CH160 | BT 40      | M3 - M8  | 61   | 43   | 20   | ER 16     | 20,5           | 81,5             |
| VA01M05002CH160 | BT 50      | M3 - M8  | 72   | 43   | 20   | ER 16     | 20,5           | 92,5             |
| VA01M04002CH250 | BT 40      | M6 - M20 | 82   | 60   | 32   | ER 25     | 23,5           | 105,5            |
| VA01M05002CH250 | BT 50      | M6 - M20 | 93   | 60   | 32   | ER 25     | 23,5           | 116,5            |

## SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR

With internal through coolant capability (1)



MAS 403 BT - B



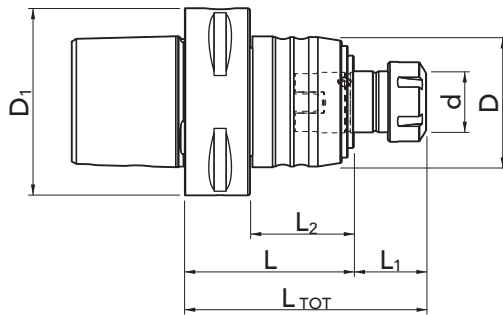
| Article Code    | Attachment | Tap Size  | L    | ø D  | ø d  | ER collet | L <sub>1</sub> | L <sub>TOT</sub> |
|-----------------|------------|-----------|------|------|------|-----------|----------------|------------------|
|                 |            |           | [mm] | [mm] | [mm] |           | [mm]           | [mm]             |
| VA01M05002CH400 | BT 50 B    | M14 - M33 | 124  | 87   | 50   | ER 40     | 28,5           | 152,5            |

(1) For coolant pressure above 50 bars a special nut screw is available on request

# SYNCHRONOUS ER TAPPING ATTACHMENT with QUICK-CHANGE TAP ADAPTOR With internal through coolant capability (1)



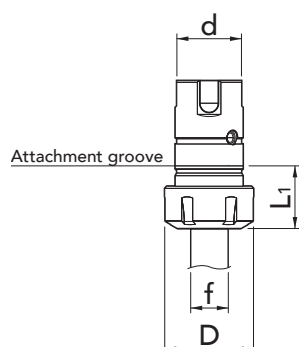
## POLIGONAL Attachment ISO 26623-1



| Article Code    | Attachment            | Tap Size  | L    | L <sub>2</sub> | ø D  | ø d  | ER collet | L <sub>1</sub> | L <sub>TOT</sub> |
|-----------------|-----------------------|-----------|------|----------------|------|------|-----------|----------------|------------------|
|                 | ø D <sub>1</sub> [mm] |           | [mm] | [mm]           | [mm] | [mm] |           | [mm]           | [mm]             |
| VA01P04002CH160 | C40                   | M3 - M8   | 55   | 35             | 43   | 20   | ER 16     | 20,5           | 75,5             |
| VA01P05002CH160 | C50                   | M3 - M8   | 55   | 35             | 43   | 20   | ER 16     | 20,5           | 75,5             |
| VA01P06302CH160 | C63                   | M3 - M8   | 57   | 35             | 43   | 20   | ER 16     | 20,5           | 77,5             |
| VA01P08002CH160 | C80                   | M3 - M8   | 66   | 36             | 43   | 20   | ER 16     | 20,5           | 86,5             |
| VA01P04002CH250 | C40                   | M6 - M20  | 75   | 55             | 60   | 32   | ER 25     | 23,5           | 98,5             |
| VA01P05002CH250 | C50                   | M6 - M20  | 75   | 55             | 60   | 32   | ER 25     | 23,5           | 98,5             |
| VA01P06302CH250 | C63                   | M6 - M20  | 77   | 55             | 60   | 32   | ER 25     | 23,5           | 100,5            |
| VA01P08002CH250 | C80                   | M6 - M20  | 86   | 56             | 60   | 32   | ER 25     | 23,5           | 109,5            |
| VA01P08002CH400 | C80                   | M14 - M33 | 116  | 86             | 87   | 50   | ER 40     | 28,5           | 144,5            |

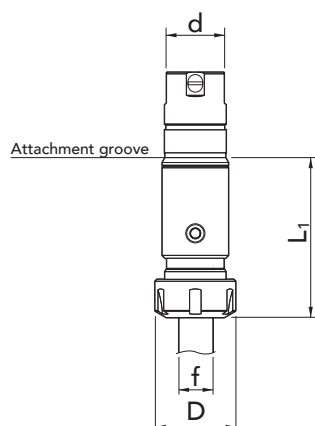
(1) For coolant pressure above 50 bars a special nut screw is available on request

## QUICK-CHANGE TAP ADAPTOR



| Article Code     | Tap Size  | Shaft $\varnothing$<br>f [mm] | $\varnothing$ d<br>[mm] | $\varnothing$ D<br>[mm] | L <sub>1</sub><br>[mm] | ER collet |
|------------------|-----------|-------------------------------|-------------------------|-------------------------|------------------------|-----------|
| *CHADAP160310000 | M3 - M8   | 3 - 8                         | 20                      | 28                      | 20,5                   | ER 16     |
| CHADAP250316000  | M6 - M20  | 3 - 16                        | 32                      | 42                      | 23,5                   | ER 25     |
| CHADAP400626000  | M14 - M33 | 6 - 25                        | 50                      | 63                      | 28,5                   | ER 40     |

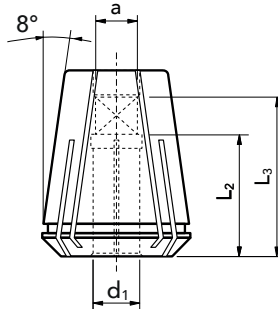
## EXTENDED QUICK-CHANGE TAP ADAPTOR



| Article Code     | Tap Size  | Shaft $\varnothing$<br>f [mm] | $\varnothing$ d<br>[mm] | $\varnothing$ D<br>[mm] | L <sub>1</sub><br>[mm] | ER collet |
|------------------|-----------|-------------------------------|-------------------------|-------------------------|------------------------|-----------|
| *CHEXAD160310000 | M3 - M8   | 3 - 8                         | 20                      | 28                      | 51,5                   | ER 16     |
| CHEXAD250316000  | M6 - M20  | 3 - 16                        | 32                      | 42                      | 80,5                   | ER 25     |
| CHEXAD400626000  | M14 - M33 | 6 - 25                        | 50                      | 63                      | 90,5                   | ER 40     |

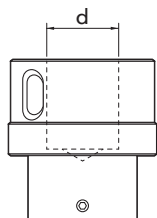
\* Hexagonal nut screw

DIN 6499



| Article Code    | ER collet | $\varnothing d_1$ | a    | L <sub>2</sub> | L <sub>3</sub> |
|-----------------|-----------|-------------------|------|----------------|----------------|
|                 |           | [mm]              | [mm] | [mm]           | [mm]           |
| SLERGB160103500 | ER 16     | 3,5               | 2,7  | 18             | 24             |
| SLERGB160104500 | ER 16     | 4,5               | 3,4  | 18             | 24             |
| SLERGB160105500 | ER 16     | 5,5               | 4,3  | 18             | 25             |
| SLERGB160106000 | ER 16     | 6                 | 4,9  | 18             | 26             |
| SLERGB160107000 | ER 16     | 7                 | 5,5  | 18             | 26             |
| SLERGB160108000 | ER 16     | 8                 | 6,2  | 22             | 31             |
| SLERGB250103500 | ER 25     | 3,5               | 2,7  | 18             | 24             |
| SLERGB250104500 | ER 25     | 4,5               | 3,4  | 18             | 24             |
| SLERGB250105500 | ER 25     | 5,5               | 4,3  | 18             | 25             |
| SLERGB250106000 | ER 25     | 6                 | 4,9  | 18             | 26             |
| SLERGB250107000 | ER 25     | 7                 | 5,5  | 18             | 26             |
| SLERGB250108000 | ER 25     | 8                 | 6,2  | 22             | 31             |
| SLERGB250109000 | ER 25     | 9                 | 7    | 22             | 32             |
| SLERGB250110000 | ER 25     | 10                | 8    | 25             | 36             |
| SLERGB250111000 | ER 25     | 11                | 9    | 25             | 37             |
| SLERGB250112000 | ER 25     | 12                | 9    | 25             | 37             |
| SLERGB250114000 | ER 25     | 14                | 11   | 25             | 39             |
| SLERGB250116000 | ER 25     | 16                | 12   | 25             | 40             |
| SLERGB400106000 | ER 40     | 6                 | 4,9  | 18             | 26             |
| SLERGB400107000 | ER 40     | 7                 | 5,5  | 18             | 26             |
| SLERGB400108000 | ER 40     | 8                 | 6,2  | 22             | 31             |
| SLERGB400109000 | ER 40     | 9                 | 7    | 22             | 32             |
| SLERGB400110000 | ER 40     | 10                | 8    | 25             | 36             |
| SLERGB400111000 | ER 40     | 11                | 9    | 25             | 37             |
| SLERGB400112000 | ER 40     | 12                | 9    | 25             | 37             |
| SLERGB400114000 | ER 40     | 14                | 11   | 25             | 39             |
| SLERGB400116000 | ER 40     | 16                | 12   | 25             | 40             |
| SLERGB400118000 | ER 40     | 18                | 14,5 | 25             | 42             |
| SLERGB400120000 | ER 40     | 20                | 16   | 28             | 47             |
| SLERGB400122000 | ER 40     | 22                | 18   | 28             | 49             |
| SLERGB400125000 | ER 40     | 25                | 20   | 33             | 56             |

## ASSEMBLY SUPPORT



| Article Code    | ER collet | Ø d  |  |  |  |  |
|-----------------|-----------|------|--|--|--|--|
|                 |           | [mm] |  |  |  |  |
| ASCHADAP1620000 | ER 16     | 20   |  |  |  |  |
| ASCHADAP2532000 | ER 25     | 32   |  |  |  |  |
| ASCHADAP4050000 | ER 40     | 50   |  |  |  |  |

## WRENCH for nut screw



| Article Code    | Nut Screw | ER collet |  |  |  |  |
|-----------------|-----------|-----------|--|--|--|--|
| KE02ER160200000 | Esagonale | ER 16     |  |  |  |  |
| KE04ER250200000 | Standard  | ER 25     |  |  |  |  |
| KE04ER400200000 | Standard  | ER 40     |  |  |  |  |

## TIGHTENING TORQUE TABLE

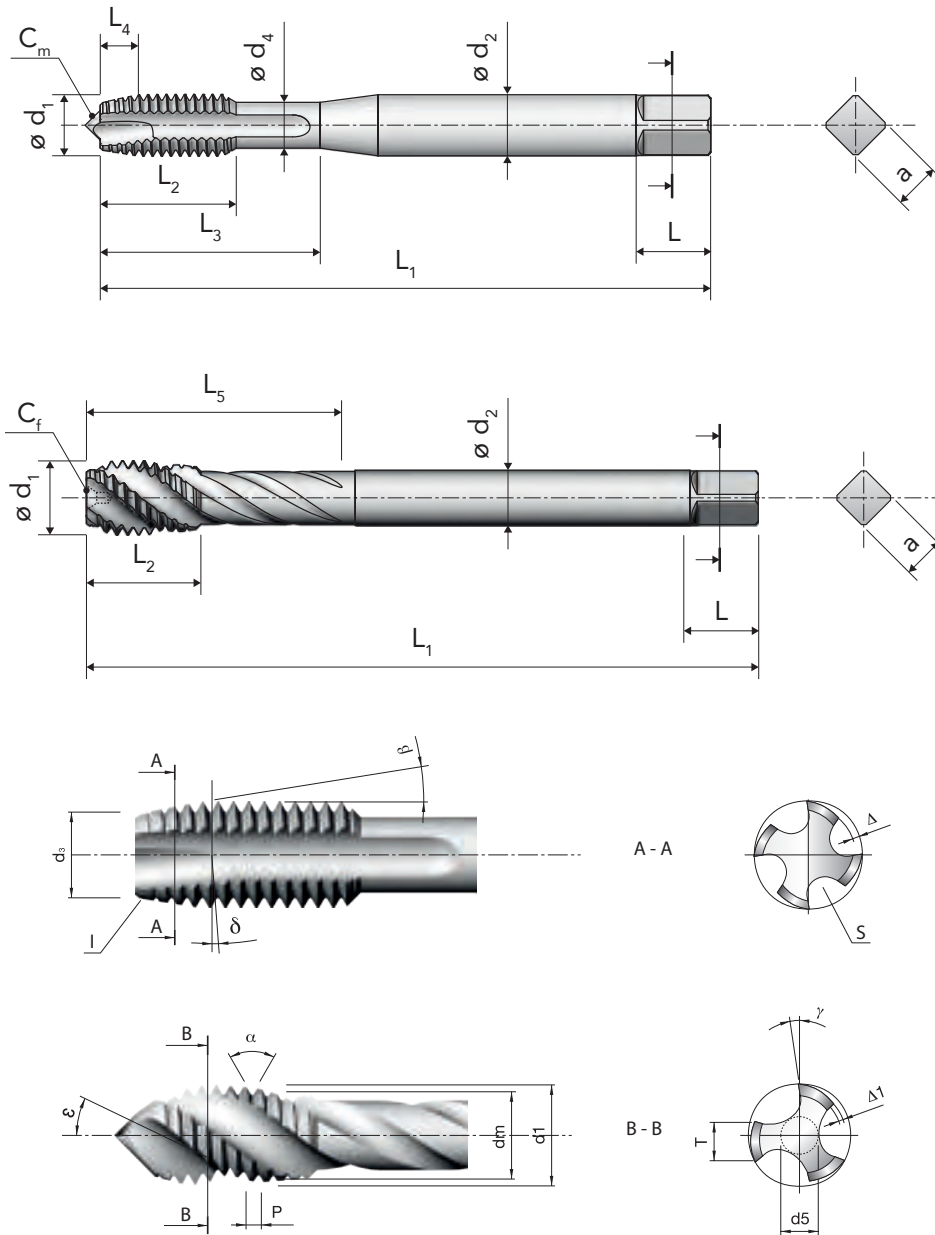
It is recommended to tighten the nut screws with the torque values shown in the table below.

| Article Code | Torque [Nm] |
|--------------|-------------|
| ER 16        | 45          |
| ER 25        | 70          |
| ER 40        | 150         |



## TECHNICAL INFORMATION

# Tap terminology



## **$d_1$** Nominal diameter

the diameter used for the purpose of general identification.

## **$d_m$** Pitch diameter

the diameter measured where the width of the thread is equal to half the pitch.

## **$d_2$** Shank diameter

the diameter of the shank, important for the tapping attachment.

## **$d_3$** Chamfer diameter

the diameter at the leading end of the chamfer.

## **$d_4$** Neck diameter

the diameter of the reduced section between the thread and shank of the tap.

## **$d_5$** Core diameter

the diameter of a circle tangent to the bottom of the flutes.

## **$l$** Chamfer

the taper on the threads at the front end of the tap made by grinding and relieving the crests of the first few teeth.

## **$a$** Square

the square with rounded corners formed by four flats parallel to the tap axis. The square serves to drive the tap.

# Tap terminology

**L**

## Square length

the length of the flats that form the square.

**L<sub>1</sub>**

## Total length

the complete length of the tap from end to end, excluding external centres.

**L<sub>2</sub>**

## Thread length

the length of the threaded section of the tap.

**L<sub>3</sub>**

## Usable length

the length measured from the front end of the tap to the end of the neck section. This length determines the maximum threadable depth on taps with reinforced shank.

**L<sub>4</sub>**

## Chamfer length

the length of the chamfer measured parallel to the tap axis, excluding the chamfer bevel.

**L<sub>5</sub>**

## Flute length

the axial length of the flute including the cutter sweep.

**C<sub>m</sub>**

## External centre

the pointed end of the tap.

**C<sub>f</sub>**

## Internal centre

the countersink in one or both ends of the tap.

**P**

## Pitch

the distance, measured parallel to the tap axis, between two corresponding and successive points on the thread profile.

**α**

## Angle of thread

the angle between the flanks of the thread (measured in an axial plane).

**δ**

## Thread lead angle

the angle made by the spiral of the thread and a plane perpendicular to the tap axis, measured on the pitch diameter line.

**β**

## Chamfer angle

the angle between the chamfer and the tap axis, measured in an axial plane.

**γ**

## Rake angle

the angle between the cutting face of the tap and a radial line passing through the crest of the tooth at the cutting edge.

**T**

## Land width

the chordal width of material between two successive flutes.

**S**

## Flute

the longitudinal channels in a tap which create cutting edges. The flutes provide space for chips and passage for coolant/lubricant.

**Δ1**

## Pitch diameter relief

the radial reduction of the pitch and/or major diameter behind the cutting edge of the tap. The relief confers cutting properties and provides clearance between the part being threaded and the tap threads.

**Δ**

## Chamfer relief

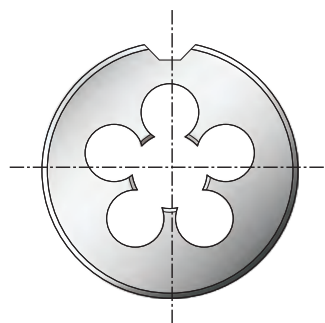
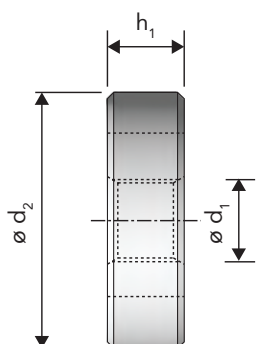
the radial reduction of the major diameter on the tap chamfer behind the cutting edge. The chamfer relief confers cutting properties to the tap.

**ε**

## Spiral flute angle

the angle formed by the flutes and the tap axis.

# Die terminology



**d<sub>1</sub>**

nominal diameter

**d<sub>2</sub>**

outside diameter

**h<sub>1</sub>**

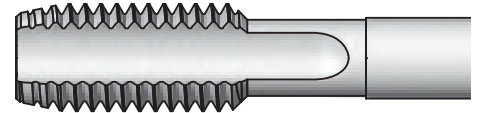
thickness



## Flute geometries

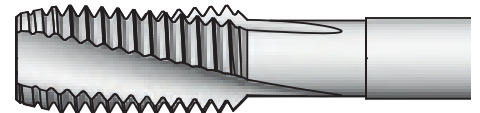
### STRAIGHT FLUTES

These taps are used on steels with normal strength and toughness ( $R=750 \text{ N/mm}^2$ ) as well as on short-chipping abrasive materials (grey cast iron, bronze, etc.).



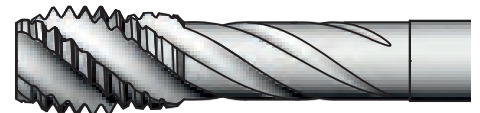
### SPIRAL FLUTES, 15° Righthand Spiral

These taps improve chip evacuation and are well suited when tapping blind holes of medium depth on tough materials.



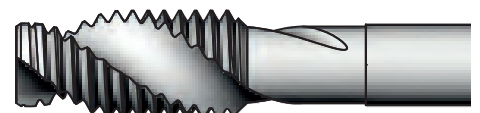
### SPIRAL FLUTES, 40°/45° Righthand Spiral

The high helix angle ensures the evacuation of chips from deep blind holes.



### SPIRAL FLUTES, 40° Righthand Spiral, FOR LIGHT ALLOYS

The large flutes and high helix angle ensure efficient chip removal on long-chipping light alloys such as aluminium.





## Flute geometries

### STRAIGHT FLUTES WITH INTERRUPTED THREADS

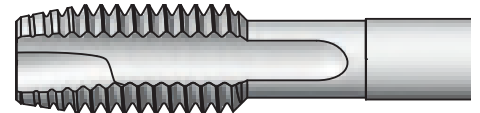
For tapping soft and mild materials such as iron, aluminium etc. The interrupted threads avoid chips sticking to the thread flanks and consequent damage of the tap.



### SPIRAL POINT

The spiral point or gun nose is produced by a high helix angle combined with an increased rake angle in the front area of the tap. This design ensures spontaneous chip evacuation in the feed direction.

This geometry is suitable when tapping through holes on materials which produce continuous chips.



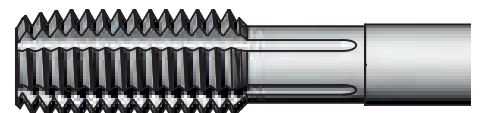
### FORMING TAPS WITHOUT OIL GROOVES

These tools produce threads through plastic deformation of the workpiece material. No chips are produced during the tapping process.



### FORMING TAPS WITH OIL GROOVES

The oil grooves improve lubrication in the chamfer area making these taps suitable for threading deep holes.



## Types of chamfer forms

The types of chamfer are defined in standards DIN 2175 and DIN 2197 for forming taps and cutting taps, respectively.

|                         | Form A                                                                            | Form B                                                                            | Form C                                                                                                                                                                                                                                                | Form D                                                                            | Form E                                                                                                                                                                                                                                                     | Form F                                                                                                                                                                  |
|-------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chamfer form and length |  |  |                                                                                                                                                                      |  |                                                                                                                                                                         |                                                                                      |
| Flute type              |  |  |    |  |    |   |

## Types of centres

The tap manufacturer, according to the diameter and the application, defines the types of centres. Types of centre and chamfer are generally combined together as in the following table, but for specific applications exceptions are possible.

|                                                                                                      |     | Form A                                 | Form B                                 | Form C                                 | Form D                                | Form E    |
|------------------------------------------------------------------------------------------------------|-----|----------------------------------------|----------------------------------------|----------------------------------------|---------------------------------------|-----------|
| Male centre<br>   | M   | $M2 \leq \emptyset \leq M8$            | $M2 \leq \emptyset \leq M8$            | $M2 \leq \emptyset \leq M8$            | $M2 \leq \emptyset \leq M8$           | -         |
|                                                                                                      | MF  | $M2 \leq \emptyset \leq M6$            | $M4 \leq \emptyset \leq M6$            | $M2 \leq \emptyset \leq M6$            | $M5 \leq \emptyset \leq M6$           | -         |
|                                                                                                      | UNC | $Nr.2-56 \leq \emptyset \leq 1/4"-18$  | $Nr.2-56 \leq \emptyset \leq 1/4"-18$  | $Nr.2-56 \leq \emptyset \leq 1/4"-18$  | $Nr.2-56 \leq \emptyset \leq 1/4"-18$ | -         |
|                                                                                                      | UNF | $Nr.2-64 \leq \emptyset \leq 1/4"-28$  | $Nr.2-64 \leq \emptyset \leq 1/4"-28$  | $Nr.2-64 \leq \emptyset \leq 1/4"-28$  | -                                     | -         |
|                                                                                                      | G   | -                                      | -                                      | -                                      | -                                     | -         |
| Half centre<br>   | M   | $M8 < \emptyset \leq M10$              | $M8 < \emptyset \leq M10$              | $M8 < \emptyset \leq M10$              | $M8 < \emptyset \leq M10$             | -         |
|                                                                                                      | MF  | $M6 < \emptyset \leq M10$              | $M6 < \emptyset \leq M10$              | $M6 < \emptyset \leq M10$              | $M6 < \emptyset \leq M10$             | -         |
|                                                                                                      | UNC | $5/16"-18 \leq \emptyset \leq 3/8"-16$ | $5/16"-18 \leq \emptyset \leq 3/8"-16$ | $5/16"-18 \leq \emptyset \leq 3/8"-16$ | -                                     | -         |
|                                                                                                      | UNF | $5/16"-24 \leq \emptyset \leq 3/8"-24$ | $5/16"-24 \leq \emptyset \leq 3/8"-24$ | $5/16"-24 \leq \emptyset \leq 3/8"-24$ | -                                     | -         |
|                                                                                                      | G   | $\emptyset = 1/8"-28$                  | $\emptyset = 1/8"-28$                  | $\emptyset = 1/8"-28$                  | -                                     | -         |
| Female centre<br> | M   | $\emptyset > M10$                      | $\emptyset > M10$                      | $\emptyset > M10$                      | $\emptyset > M10$                     | ALL SIZES |
|                                                                                                      | MF  | $\emptyset > M10$                      | $\emptyset > M10$                      | $\emptyset > M10$                      | $\emptyset > M10$                     | ALL SIZES |
|                                                                                                      | UNC | $\emptyset \geq 7/16"-14$              | $\emptyset \geq 7/16"-14$              | $\emptyset \geq 7/16"-14$              | $\emptyset \geq 5/16"-18$             | ALL SIZES |
|                                                                                                      | UNF | $\emptyset \geq 7/16"-20$              | $\emptyset \geq 7/16"-20$              | $\emptyset \geq 7/16"-20$              | -                                     | ALL SIZES |
|                                                                                                      | G   | $\emptyset \geq 1/4"-19$               | $\emptyset \geq 1/4"-19$               | $\emptyset \geq 1/4"-19$               | -                                     | ALL SIZES |

## Formulae

| Parameter        | Formula                                                                    | Unit of Measurement            |
|------------------|----------------------------------------------------------------------------|--------------------------------|
| Cutting speed    | $V_c = \frac{N \cdot \pi \cdot d_1}{1000}$                                 | $\frac{\text{m}}{\text{min}}$  |
| Rotational speed | $N = \frac{1000 \cdot V_c}{\pi \cdot d_1}$                                 | rpm                            |
| Torque(*)        | $M_t = \frac{K_c \cdot p^2 \cdot z^{0.6} \cdot d_1}{10^4}$                 | N · m                          |
| Spindle power    | $P = \frac{M_t \cdot 2 \cdot \pi \cdot N}{60}$                             | W                              |
| Nominal diameter | $d_1$                                                                      | mm                             |
| Feed             | $p \cdot N$                                                                | $\frac{\text{mm}}{\text{min}}$ |
| p                | Thread pitch                                                               | mm                             |
| z                | Number of flutes                                                           | -                              |
| $K_c$            | Cutting force coefficient<br>(function of the material<br>and of tap wear) | $\frac{\text{N}}{\text{mm}^2}$ |

| M.G. | $K_c$<br>[N/mm <sup>2</sup> ] |
|------|-------------------------------|
| P.1  | 1300                          |
| P.2  | 1400                          |
| P.3  | 1400                          |
| P.4  | 1600                          |
| P.5  | 1700                          |
| P.6  | 2000                          |
| P.7  | 1400                          |
| M.1  | 1600                          |
| M.2  | 1800                          |
| K.1  | 1100                          |
| K.2  | 1500                          |
| K.3  | 1600                          |
| N.1  | 600                           |
| N.2  | 800                           |
| N.3  | 900                           |
| N.4  | 1000                          |
| N.5  | 700                           |
| N.6  | 850                           |
| N.7  | 900                           |
| N.8  | 2500                          |
| N.9  | 400                           |
| N.10 | 500                           |
| S.1  | 1200                          |
| S.2  | 1900                          |
| S.3  | 1300                          |
| S.4  | 2400                          |

(\*) The torque value is valid for a new cutting tap.

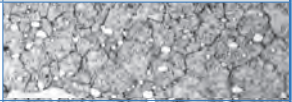
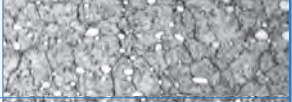
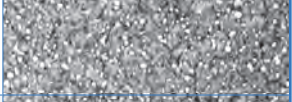
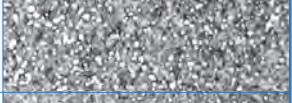
For worn-out taps, the value can increase up to 2-3 times. For forming taps, the value must be multiplied by 1,5-2 times.

## Conversion table hardness vs tensile strength

| Tensile Strength | Hardness                  |               |                   |
|------------------|---------------------------|---------------|-------------------|
|                  | R<br>[N/mm <sup>2</sup> ] | HB<br>Brinell | HRC<br>Rockwell C |
|                  |                           |               | HV<br>Vickers     |
| 3400             | 700                       | 68            | 1008              |
| 3120             | 688                       | 67            | 955               |
| 2960             | 676                       | 66            | 920               |
| 2890             | 670                       | 65            | 885               |
| 2770             | 659                       | 64            | 850               |
| 2240             | 650                       | 63            | 826               |
| 2190             | 635                       | 62            | 797               |
| 2140             | 627                       | 61            | 772               |
| 2100             | 613                       | 60            | 746               |
| 2050             | 600                       | 59            | 720               |
| 2010             | 587                       | 58            | 693               |
| 1970             | 574                       | 57            | 666               |
| 1930             | 561                       | 56            | 646               |
| 1890             | 548                       | 55            | 623               |
| 1850             | 536                       | 54            | 604               |
| 1810             | 524                       | 53            | 585               |
| 1780             | 512                       | 52            | 567               |
| 1730             | 500                       | 51            | 549               |
| 1680             | 488                       | 50            | 528               |
| 1630             | 476                       | 49            | 513               |
| 1590             | 464                       | 48            | 497               |
| 1560             | 453                       | 47            | 482               |
| 1520             | 442                       | 46            | 468               |
| 1480             | 430                       | 45            | 453               |
| 1440             | 419                       | 44            | 440               |

| Tensile Strength | Hardness                  |               |                   |
|------------------|---------------------------|---------------|-------------------|
|                  | R<br>[N/mm <sup>2</sup> ] | HB<br>Brinell | HRC<br>Rockwell C |
|                  |                           |               | HV<br>Vickers     |
| 1400             | 408                       | 43            | 427               |
| 1360             | 398                       | 42            | 416               |
| 1320             | 389                       | 41            | 404               |
| 1300             | 377                       | 40            | 391               |
| 1260             | 367                       | 39            | 381               |
| 1230             | 357                       | 38            | 371               |
| 1190             | 347                       | 37            | 357               |
| 1150             | 337                       | 36            | 345               |
| 1120             | 327                       | 35            | 332               |
| 1100             | 319                       | 34            | 323               |
| 1060             | 309                       | 33            | 314               |
| 1040             | 301                       | 32            | 304               |
| 1010             | 294                       | 31            | 296               |
| 980              | 286                       | 30            | 288               |
| 960              | 279                       | 29            | 280               |
| 940              | 272                       | 28            | 273               |
| 910              | 265                       | 27            | 266               |
| 890              | 259                       | 26            | 259               |
| 870              | 253                       | 25            | 253               |
| 850              | 247                       | 24            | 247               |
| 830              | 241                       | 23            | 241               |
| 810              | 235                       | 22            | 235               |
| 790              | 230                       | 21            | 230               |
| 770              | 225                       | 20            | 225               |

## High speed steel and solid carbide for taps

| Vergnano Designation | Designation according to ISO 11054 | Hardness | Toughness | Applications                                                                                | Structure (500x)                                                                    |
|----------------------|------------------------------------|----------|-----------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>HSS</b>           | HSS                                | •        | •         | Used exclusively for hand taps (except A100).                                               |  |
| <b>HSSE</b>          | HSS-E                              | •        | • •       | For general applications.                                                                   |  |
| <b>HSSK</b>          | HSS-E-PM                           | • •      | • • •     | Used in applications where a compromise between high hardness and high toughness is needed. |  |
| <b>HSSZ</b>          | HSS-E-PM                           | • •      | • • •     | For applications where extremely high performance and productivity are requested.           |  |
| <b>HSSP</b>          | HSS-E-PM                           | • • •    | • •       | For tough materials and extreme applications.                                               |  |
| <b>HM</b>            | -                                  | • • •    | -         | For heat-treated steels and abrasive materials.                                             |  |

## Coatings and surface treatments - properties

| Type of coating / treatment | Structure         | Hardness | Friction Coefficient | Oxidation Temperature | Features                                       |
|-----------------------------|-------------------|----------|----------------------|-----------------------|------------------------------------------------|
| <b>TiN</b>                  | Mono-layer        | • •      | • •                  | •                     | Wear resistance                                |
| <b>TiCN</b>                 | Mono-layer        | • •      | • •                  | •                     | Wear resistance                                |
| <b>TiX2</b>                 | Multi-layer       | • • •    | • • •                | • •                   | Oxidation and wear resistance, chip evacuation |
| <b>TiH1</b>                 | Multi-layer       | • • •    | • • •                | • •                   | Oxidation and wear resistance, chip evacuation |
| <b>G-MAXX</b>               | Multi-layer       | • • •    | • • •                | • •                   | Oxidation and wear resistance, chip evacuation |
| <b>CrN</b>                  | Mono-layer        | •        | • •                  | • •                   | Wear resistance, chip evacuation               |
| <b>V-MAXX</b>               | Mono-layer        | • • •    | • •                  | • • •                 | Wear resistance, chip evacuation               |
| <b>RED-MAXX</b>             | Mono-layer        | • • •    | • •                  | • • •                 | Wear resistance, chip evacuation               |
| <b>VAP</b>                  | Surface oxidation | -        | • •                  | •                     | Chip evacuation                                |
| <b>NiTR</b>                 | Surface hardening | •        | •                    | •                     | Wear resistance                                |

Excellent  
Very good  
Good



## Coatings - applications for cuttings taps

| COATINGS RECOMMENDED FOR CUTTINGS TAPS |                                            |       |                                                                                | TiN     | TiCN | TiX2 | TiH1 | CrN | V-MAXX | G-MAXX | VAP | NiTR |
|----------------------------------------|--------------------------------------------|-------|--------------------------------------------------------------------------------|---------|------|------|------|-----|--------|--------|-----|------|
| ISO                                    | Material                                   | Group | Application                                                                    | Coating |      |      |      |     |        |        |     |      |
| P                                      | Steel                                      | P.1   | Mild / magnetic steel                                                          | ○       |      |      | ○    |     |        |        | ●   |      |
|                                        |                                            | P.2   | Construction steel, case hardening steel                                       | ●       |      |      | ○    |     |        |        | ○   |      |
|                                        |                                            | P.3   | Carbon steel                                                                   | ●       |      |      | ○    |     |        |        |     |      |
|                                        |                                            | P.4   | Alloyed steel / tempered steel                                                 | ○       | ○    |      | ●    |     |        |        |     |      |
|                                        |                                            | P.5   | Alloyed steel / tempered steel                                                 | ○       | ○    |      | ●    |     |        |        |     |      |
|                                        |                                            | P.6   | Alloyed steel / high strength steel                                            | ○       | ○    |      | ●    |     |        |        |     |      |
|                                        |                                            | P.7   | Ferritic stainless steel, martensitic stainless steel, precipitation hardening | ○       |      | ●    |      |     |        | ●      | ○   |      |
| M                                      | Stainless Steel                            | M.1   | Austenitic stainless steel                                                     |         |      | ●    | ○    |     |        | ●      | ○   |      |
|                                        |                                            | M.2   | Ferritic+austenitic (Duplex)                                                   |         |      | ●    | ○    |     |        | ●      | ○   |      |
| K                                      | Cast iron                                  | K.1   | Grey cast iron                                                                 |         | ○    |      |      |     | ●      |        |     | ○    |
|                                        |                                            | K.2   | Nodular cast iron, malleable cast iron, tempered cast iron                     | ●       |      |      | ○    |     |        |        |     |      |
|                                        |                                            | K.3   | Austempered ductile iron (ADI)                                                 |         |      |      |      |     | ●      |        |     |      |
| N                                      | Aluminium<br>Aluminium alloys              | N.1   | Pure aluminium                                                                 |         |      |      | ●    |     |        |        | ○   |      |
|                                        |                                            | N.2   | Aluminium wrought and die cast alloys with Si < 0,5% (long chipping)           | ○       |      |      | ●    |     |        |        | ○   |      |
|                                        |                                            | N.3   | Aluminium wrought and die cast alloys with Si > 10% (medium chipping)          | ○       |      |      | ●    |     |        |        | ○   |      |
|                                        |                                            | N.4   | Aluminium die cast alloys with Si > 10% (short chipping)                       |         | ○    |      |      |     | ●      |        |     | ○    |
|                                        | Copper<br>Copper alloys<br>Brass<br>Bronze | N.5   | Pure copper                                                                    |         |      |      | ●    |     |        |        | ○   |      |
|                                        |                                            | N.6   | Copper alloys (long chipping), soft brass                                      | ○       |      |      | ●    |     |        |        | ○   |      |
|                                        |                                            | N.7   | Copper alloys (short chipping), hard brass                                     |         | ●    |      |      |     |        |        |     | ○    |
|                                        |                                            | N.8   | High strength bronze                                                           |         | ○    |      |      |     | ●      |        |     | ○    |
|                                        | Magnesium<br>Magnesium alloys              | N.9   | Pure magnesium, magnesium alloys                                               |         | ○    |      |      |     |        |        |     | ●    |
|                                        |                                            | N.10  | High strength magnesium alloys                                                 |         | ○    |      |      |     |        |        |     | ●    |
| S                                      | Titanium<br>Titanium alloys                | S.1   | Pure titanium                                                                  |         |      |      | ○    | ●   |        |        |     |      |
|                                        |                                            | S.2   | Titanium alloys                                                                |         |      |      | ○    | ●   |        |        |     |      |
|                                        | Nickel<br>Nickel alloys                    | S.3   | Pure nickel                                                                    | ○       |      |      | ●    |     |        |        |     |      |
|                                        |                                            | S.4   | Nickel alloys                                                                  | ○       |      |      | ●    |     |        |        |     |      |
| H                                      | Hardened materials                         | H.1   | Alloyed steel, hardness HRC 44-55                                              |         |      |      |      |     | ○      |        |     |      |
|                                        |                                            | H.2   | Alloyed steel, hardness HRC 56-63                                              |         |      |      |      |     | ○      |        |     |      |

## Coatings - applications for cold forming taps

| COATINGS RECOMMENDED FOR COLD FORMING TAPS |                                         |       |                                                                                | TiN     | V-MAXX | RED-MAXX |
|--------------------------------------------|-----------------------------------------|-------|--------------------------------------------------------------------------------|---------|--------|----------|
| ISO                                        | Material                                | Group | Application                                                                    | Coating |        |          |
| P                                          | Steel                                   | P.1   | Mild / magnetic steel                                                          | ○       |        |          |
|                                            |                                         | P.2   | Construction steel, case hardening steel                                       | ●       | ●      |          |
|                                            |                                         | P.3   | Carbon steel                                                                   | ●       | ●      | ●        |
|                                            |                                         | P.4   | Alloyed steel / tempered steel                                                 | ●       | ●      | ●        |
|                                            |                                         | P.5   | Alloyed steel / tempered steel                                                 | ●       | ●      | ●        |
|                                            |                                         | P.7   | Ferritic stainless steel, martensitic stainless steel, precipitation hardening | ○       | ●      | ○        |
| M                                          | Stainless Steel                         | M.1   | Austenitic stainless steel                                                     | ○       | ●      | ○        |
|                                            |                                         | M.2   | Ferritic+austenitic (Duplex)                                                   | ○       | ●      | ○        |
| N                                          | Aluminium<br>Aluminium alloys           | N.1   | Pure aluminium                                                                 | ○       |        |          |
|                                            |                                         | N.2   | Aluminium wrought and die cast alloys with Si < 0,5% (long chipping)           | ●       | ●      | ○        |
|                                            |                                         | N.3   | Aluminium wrought and die cast alloys with Si < 10 % (medium chipping)         | ●       | ●      | ○        |
|                                            | Copper<br>Copper alloys<br>Brass/Bronze | N.5   | Pure copper                                                                    | ○       | ●      | ○        |
|                                            |                                         | N.6   | Copper alloys (long chipping), soft brass                                      | ●       | ●      |          |
| S                                          | Titanium<br>Titanium alloys             | S.1   | Pure titanium                                                                  |         | ●      | ●        |
|                                            |                                         | S.2   | Titanium alloys                                                                |         | ●      | ●        |
|                                            | Nickel<br>Nickel alloys                 | S.3   | Pure nickel                                                                    | ○       | ●      | ●        |
|                                            |                                         | S.4   | Nickel alloys                                                                  | ○       | ●      | ●        |

- Ideal
- Suitable

# Troubleshooting

Tapping is a complex process and often the last machining operation performed on the workpiece.

Therefore, incorrect or faulty tapping can compromise the quality of the entire workpiece.

Numerous factors influence the process: cutting parameters, drilling parameters, lubrication, machine conditions.

The choice of the correct tool is paramount in order to obtain high quality threads.

The following table summarises the most common problems encountered during tapping and their possible solutions.

| Problem                           | Solution                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Chipped teeth on tap              | <ul style="list-style-type: none"> <li>• Choose correct tap, with lower rake angle or longer chamfer.</li> <li>• Reduce cutting speed.</li> <li>• Check drilled hole size is not too small.</li> <li>• Check tap alignment and run-out of tap on tapping attachment.</li> <li>• For deep blind holes (<math>\geq 2,5 \times D</math>) use taps with back-tapering.</li> </ul> |
| Excessive tap wear                | <ul style="list-style-type: none"> <li>• Improve quality (richer emulsion, neat oil) and quantity (higher pressure) of lubrication.</li> <li>• Use correct tap, with more relief or longer chamfer if possible.</li> <li>• Choose coating suitable for specific application.</li> <li>• Use recommended cutting parameters for specific application.</li> </ul>               |
| Chips clogging flutes             | <ul style="list-style-type: none"> <li>• Use tap with lower spiral flute angle.</li> <li>• Choose correct tap with suitable rake angle and relief for specific application.</li> <li>• Use tap with sharp cutting edge (bright tap or vapourised tap).</li> </ul>                                                                                                             |
| Poor finish on threaded workpiece | <ul style="list-style-type: none"> <li>• Check wear on tap. If necessary, sharpen or change tap.</li> <li>• Improve quality and quantity of lubrication.</li> <li>• Choose correct tap with suitable rake angle and relief for specific application.</li> <li>• Use recommended cutting parameters for specific application.</li> </ul>                                       |
| Built-up-edge                     | <ul style="list-style-type: none"> <li>• Choose correct tap with lower rake angle and/or higher relief.</li> <li>• Choose coating suitable for specific application.</li> <li>• Increase cutting speed.</li> <li>• Improve quality and quantity of lubrication.</li> </ul>                                                                                                    |



## Troubleshooting

| Problem                     | Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tap sticking                | <ul style="list-style-type: none"><li>• Choose correct tap with lower rake angle and/or higher relief.</li><li>• Choose coating suitable for specific application.</li><li>• Increase cutting speed.</li><li>• Improve quality and quantity of lubrication.</li></ul>                                                                                                                                                                                                                                                                              |
| Crater wear                 | <ul style="list-style-type: none"><li>• Choose suitable tap, with base material in HSSE-PM.</li><li>• Use coated tap.</li><li>• Improve quality and quantity of lubrication.</li></ul>                                                                                                                                                                                                                                                                                                                                                             |
| Tap breakage                | <ul style="list-style-type: none"><li>• Check drilled hole size.</li><li>• Check alignment between tap and drilled hole.</li><li>• Reduce cutting speed.</li><li>• On blind holes, check that tapping depth is less than hole depth.</li><li>• Use tapping attachment with slip clutch.</li><li>• Use compensated tapping attachment.</li></ul>                                                                                                                                                                                                    |
| Oversized thread            | <ul style="list-style-type: none"><li>• Check tap tolerance is compatible with requested workpiece (nut) tolerance.</li><li>• Choose correct tap with suitable rake angle and relief for specific application.</li><li>• Reduce feed rate (revs x pitch) or use rigid / synchronous tapping attachment.</li><li>• Reduce cutting speed.</li><li>• Check tap alignment and that workpiece is fastened steadily.</li><li>• Remove clogged chips from flutes.</li></ul>                                                                               |
| Undersized thread           | <ul style="list-style-type: none"><li>• Check drilled hole size is not too small.</li><li>• Check tap tolerance is compatible with requested workpiece (nut) tolerance.</li><li>• Use coated tap to avoid tap sticking.</li><li>• On forming taps, use slightly larger drilled hole size.</li><li>• Check wear on tap. If necessary, sharpen or change tap.</li><li>• Choose correct tap with higher rake angle and relief.</li><li>• Use rigid / synchronous tapping attachment.</li><li>• Improve quality and quantity of lubrication.</li></ul> |
| Excessive power requirement | <ul style="list-style-type: none"><li>• On high strength materials, increase drilled hole size.</li><li>• Check wear on tap. If necessary, sharpen or change tap.</li><li>• Choose correct tap with higher rake angle and relief.</li><li>• Improve quality and quantity of lubrication.</li></ul>                                                                                                                                                                                                                                                 |



## Material examples

|            |                       |        | Germany      | Italy       | France          | United States |
|------------|-----------------------|--------|--------------|-------------|-----------------|---------------|
| ISO 513    | Application           | W.Nr.  | DIN          | UNI         | AFNOR           | AISI/SAE/ASTM |
| P<br>STEEL | Mild/magnetic         | 1.1015 | RFe60        |             |                 |               |
|            |                       | 1.1014 | RFe80        |             |                 |               |
|            |                       | 1.1013 | RFe100       |             |                 |               |
|            | Structural            | 1.0037 | St 37-2      | Fe360B      | E 24-2          | 1013          |
|            |                       | 1.0044 | St 44-2      | Fe430B      | E 28-2          | 1021          |
|            |                       | 1.0050 | St 50-2      | Fe490       | A 50-2          | A 570 (50)    |
|            |                       | 1.0060 | St 60-2      | Fe590       | A 60-2          | A 572 (65)    |
|            |                       | 1.0570 | St 52-3      | Fe510B      | E 36-3          | 1024          |
|            | Case hardening        | 1.0301 | C10          | C10         | C10             | 1010          |
|            |                       | 1.0401 | C15          | C15         | C18             | 1015          |
|            |                       | 1.7131 | 16MnCr5      | 16MnCr5     | 16 MC 5         | 5115          |
|            |                       | 1.7147 | 20MnCr5      | 20MnCr5     | 20 MC 5         | 5120          |
|            |                       | 1.7243 | 18CrMo4      | 18CrMo4     |                 |               |
|            |                       | 1.5919 | 15CrNi6      | 16CrNi4     | 16 NC 6         | 4320          |
|            |                       | 1.6523 | 21NiCrMo2    | 20NiCrMo2   | 20 NCD 2        | 8620          |
|            |                       | 1.6587 | 17CrNiMo1106 | 18NiCrMo5-7 | 18 NCD6/18 NCD7 | 4320          |
|            |                       | 1.8515 | 31CrMo12     | 31CrMo12    | 30 CD 12        | A/B           |
|            | Nitriding             | 1.8519 | 31CrMoV9     | 31CrMoV10   |                 |               |
|            |                       | 1.8507 | 34CrAlMo5    | 34CrAlMo7   | 30 CAD 6.12     | A355Cl.D      |
|            |                       | 1.8509 | 41CrAlMo7    | 41CrAlMo7   | 40 CAD 6.12     | E7140         |
|            | Free cutting          | 1.0711 | 9S20         | 9S20        |                 | 1212          |
|            |                       | 1.0715 | 9SMn28       | 9SMn28      | S 250           | 1213          |
|            |                       | 1.0718 | 9SMnPb28     | 9SMnPb28    | S 250 Pb        | 12 L 13       |
|            |                       | 1.0726 | 35S20        | 35S20       | 35 MF 4         | 1140          |
|            |                       | 1.0736 | 9SMn36       | 9SMn36      | S 300           | 1215          |
|            |                       | 1.0737 | 9SMnPb36     | 9SMnPb36    | S 300 Pb        | 12 L 14       |
|            | Heat-treatable        | 1.0406 | C25          | C25         | AF 50 C 30      | 1025          |
|            |                       | 1.0528 | C30          | C30         |                 | 1030          |
|            |                       | 1.0501 | C35          | C35         | AF 55 C 35      | 1035          |
|            |                       | 1.0511 | C40          | C40         | AF 60 C 40      | 1040          |
|            |                       | 1.0503 | C45          | C45         | AF 65 C 45      | 1045          |
|            |                       | 1.0540 | C50          | C50         |                 | 1050          |
|            |                       | 1.0535 | C55          | C55         | C54             | 1055          |
|            |                       | 1.0601 | C60          | C60         | C60             | 1060          |
|            |                       | 1.7035 | 41Cr4        | 41Cr4       | 41Cr4           | 5140          |
|            |                       | 1.8159 | 51CrV4       | 51CrV4      | 50 CV 4         | 6150          |
|            |                       | 1.7218 | 25CrMo4      | 25CrMo4     | 25 CD 4         | 4130          |
|            |                       | 1.7220 | 34CrMo4      | 34CrMo4     | 35 CD 4         | 4137          |
|            |                       | 1.7225 | 42CrMo4      | 42CrMo4     | 42 CD 4         | 4140          |
|            |                       | 1.7228 | 50CrMo4      | 50CrMo4     | 50CrMo4         | 4150          |
|            |                       | 1.6580 | 30CrNiMo8    | 30CrNiMo8   | 30 NCD 8        |               |
|            |                       | 1.6582 | 34CrNiMo6    | 34CrNiMo6   | 35 NCD 6        | 4337          |
|            |                       | 1.6511 | 36CrNiMo4    | 36CrNiMo4   | 40 NCD 3        | 9840          |
|            |                       | 1.6773 | 36NiCrMo16   | 36NiCrMo16  |                 |               |
|            | Ball bearing          | 1.3505 | 100Cr6       | 100Cr6      | 100C6           | 52100         |
|            |                       | 1.3536 | 100CrMo7-3   | 100CrMo7    |                 |               |
|            | Spring                | 1.1231 | Ck67         | C67         | XC 68           | 1070          |
|            |                       | 1.1248 | Ck75         | C75         |                 | 1074          |
|            |                       | 1.1269 | Ck85         | C85         | C90             | 1086          |
|            |                       | 1.1274 | Ck101        | C100        | C100            | 1095          |
|            |                       | 1.5021 |              | 48Si7       |                 |               |
|            |                       | 1.5026 | 55Si7        | 55Si7       | 56SC7           | 9255          |
|            |                       | 1.5027 |              | 60Si7       | 60Si7           | 9260          |
|            |                       | 1.7108 | 60SiCr7      | 60SiCr8     |                 | 9262          |
|            |                       | 1.8159 | 51CrV4       | 51CrV4      | 50 CV 4         | 6150          |
|            |                       | 1.7176 | 55Cr3        | 55Cr3       | 55 C 3          | 5155          |
|            | Superficial hardening | 1.7701 | 51CrMoV4     | 51CrMoV4    |                 |               |
|            |                       | 1.1183 | Cf 35        | C36         | XC 68 H1TS      |               |
|            |                       | 1.1193 | Cf 45        | C43         | XC 42 H1TS      |               |
|            |                       | 1.1213 | Cf 53        | C53         | XC 48 H1TS      | 1050          |
|            |                       | 1.7005 | 45Cr2        | 45Cr2       |                 |               |
|            |                       | 1.7043 | 38Cr4        | 38Cr4       |                 |               |
|            |                       | 1.7034 | 37Cr4        | 36CrMn4     | 38 C 4          | 5135          |
|            |                       | 1.7223 | 41CrMo4      | 41CrMo4     | 42 CD 4 TS      | 4142          |

| Russia      | Japan       | China     | India        |                            |                       |            |
|-------------|-------------|-----------|--------------|----------------------------|-----------------------|------------|
| GOST        | JIS         | GB        | IS           | MG Vergnano                | Application           | ISO 513    |
| 20860       |             |           |              | P.1                        | Mild/magnetic         | P<br>STEEL |
| 20880       |             |           |              | P.1                        |                       |            |
| 20895       |             |           |              | P.1                        |                       |            |
| St3kp/St3ps | STKM12C     | Q235A     |              | P.2                        | Structural            |            |
| St4ps/St4sp | STK400      | Q275B     | Fe440        | P.2                        |                       |            |
| St5ps/St5sp | SS490       | Q275      | Fe490        | P.2                        |                       |            |
| St6ps/St6sp | S45C        | 45        | Fe570        | P.2                        |                       |            |
| 17G1S       | STK490      | 16Mn      | Fe540        | P.2                        |                       |            |
| 10          | S10C        | 10        |              | P.2                        | Case hardening        |            |
| 15          | S15C        | 15        | 14C6         | P.2                        |                       |            |
| 18ChG       | SCR415      | 20CrMn    | 16Mn5Cr4     | P.2                        |                       |            |
| 18 ChG      | SMnC420H    | 20CrMn    | 20Mn5Cr5     | P.2                        |                       |            |
|             |             |           |              | P.2                        |                       |            |
| 15ChGN2T    | SNCM415M    |           | 15Cr6Ni6     | P.2                        |                       |            |
| 20ChGNM     | SNCM220M    | 20CrNiMo  |              | P.2                        |                       |            |
| 20ChN2M     |             |           | 16Ni6Cr7Mo3  | P.2                        | Nitriding             |            |
|             | SBV1A/SBV1B |           |              | P.4                        |                       |            |
|             |             |           |              | P.5                        |                       |            |
|             |             |           |              | P.4                        |                       |            |
| 38Ch2MJuA   | SACM645     | 38CrMoAl  | 40Cr7Al10Mo2 | P.5                        | Free cutting          |            |
| A11         | SUM21       | Y12       |              | P.1                        |                       |            |
|             | SUM22       | Y15       |              | P.1                        |                       |            |
|             | SUM22L      | Y15Pb     |              | P.1                        |                       |            |
| A35         |             | Y35       |              | P.2                        |                       |            |
|             | SUM25       |           |              | P.1                        | Heat-treatable        |            |
|             | SUM24L      |           |              | P.1                        |                       |            |
| 25          | S25C        | 25        | 25C4         | P.3                        |                       |            |
| 30          | S30C        | 30        | 30C8         | P.3                        |                       |            |
| 35          | S35C        | 35        | 35C8         | P.3                        |                       |            |
| 40          | S40C        | 40        | 40C8         | P.3                        |                       |            |
| 45          | S45C        | 45        | 45C8         | P.3                        |                       |            |
| 50          | S50C        | 50        | 50C8         | P.3                        |                       |            |
| 55          | S55C        | 55        | 55C8         | P.3                        |                       |            |
| 60          | S58C        | 60        | C604         | P.3                        |                       |            |
| 40Ch        | SCR440(H)   | 40Cr      | 40Cr4        | P.4 (norm.) / P.5 (bonif.) |                       |            |
| 50Ch        | SUP10       | 50CrVA    | 50Cr4V2      | P.4 (norm.) / P.5 (bonif.) |                       |            |
| 30ChM       | SCCrM1      | 30CrMo    | 21Cr4Mo2     | P.4 (norm.) / P.5 (bonif.) |                       |            |
| 35ChML      | SCM435      | 35CrMo    |              | P.4 (norm.) / P.5 (bonif.) |                       |            |
| 38ChA       | SCM440      | 42CrMo    | 40CrMoH      | P.4 (norm.) / P.5 (bonif.) |                       |            |
| 50Ch        | SCM445(H)   | ZG50Cr1Mo |              | P.4 (norm.) / P.5 (bonif.) |                       |            |
|             | SNCM431     |           |              | P.5 (norm.) / P.6 (bonif.) |                       |            |
| 38Ch2N2MA   | SNCM439     |           |              | P.5 (norm.) / P.6 (bonif.) |                       |            |
| 40ChGMN     |             | 40CrNiMoA |              | P.4 (norm.) / P.5 (bonif.) |                       |            |
|             |             |           |              | P.5 (norm.) / P.6 (bonif.) |                       |            |
| SChCh15     | SUJ2/SUJ4   | GCr15     |              | P.4 (norm.)                | Ball bearing          |            |
|             |             |           |              | P.4 (norm.)                |                       |            |
| 65          | S70C-CSP    | 65        | 70C6         | P.3                        | Spring                |            |
| 75A         | S75CM       | 75        |              | P.3                        |                       |            |
| 85A         | SK85        | 85        |              | P.3                        |                       |            |
|             | SK4-CSP     | T10A      | 98C6         | P.3                        |                       |            |
|             |             |           |              | P.4 (norm.) / P.5 (bonif.) |                       |            |
| 55S2/55S2A  |             | 55Si2Mn   | 55Si7        | P.4 (norm.) / P.5 (bonif.) |                       |            |
| 60S2        | SUP6        | 60Si2Mn   | 60Si7        | P.4 (norm.) / P.5 (bonif.) |                       |            |
| 60S2G       |             | 60Si2CrA  |              | P.4 (norm.) / P.5 (bonif.) |                       |            |
| 50Ch        | SUP10       | 50CrVA    | 50Cr4V2      | P.4 (norm.) / P.6 (bonif.) |                       |            |
| 50ChGA      | SUP9(A)     | 55CrMnA   | 55Cr3        | P.4 (norm.) / P.6 (bonif.) |                       |            |
|             |             |           |              | P.4 (norm.) / P.6 (bonif.) | Superficial hardening |            |
|             |             |           |              | P.3                        |                       |            |
|             |             |           |              | P.3                        |                       |            |
| 50          | S50C        |           |              | P.3                        |                       |            |
|             |             |           |              | P.4                        |                       |            |
|             |             | 38CrA     |              | P.5                        |                       |            |
| 35Ch        | SCr435H     | 35Cr      |              | P.5                        |                       |            |
| 40ChFA      | SNB22       | 42CrMo    | 40Cr4Mo3     | P.5                        |                       |            |

## Material examples

|                                |                              |        | Germany            | Italy              | France           | United States |
|--------------------------------|------------------------------|--------|--------------------|--------------------|------------------|---------------|
| ISO 513                        | Application                  | W.Nr.  | DIN                | UNI                | AFNOR            | AISI/SAE/ASTM |
| <b>P</b><br>STEEL              | Hot-work                     | 1.2767 | 45NiCrMo16         | 40NiCrMoV16 KU     | Y35NCD16         |               |
|                                |                              | 1.2713 | 55NiCrMoV7         | 55NiCrMoV7 KU      | 55NiCrMoV7       | L6            |
|                                |                              | 1.2311 |                    | 35CrMo8 KU         |                  |               |
|                                |                              | 1.2365 | 32CrMoV12-28       | 30CrMoV12-27 KU    | 32CDV12-28       | H10           |
|                                |                              | 1.2343 | X38CrMoV5-1        | X37CrMoV5-1 KU     | Z38CDV5          | H11           |
|                                |                              | 1.2344 | X40CrMoV5-1        | X40CrMoV5-1-1 KU   | Z40CDV5          | H13           |
|                                |                              | 1.2567 | X30WCrV5-3         | X30WCrV5-3 KU      | Z32WCV5          | H14           |
|                                |                              | 1.2581 | X30WCrV9-3         | X30WCrV9-3 KU      | Z30WCV9          | H21           |
|                                | Ferritic stainless steel     | 1.4002 | X6CrAl13           | X6CrAl13           | Z 8 CA 12        | 405           |
|                                |                              | 1.4512 | X2CrTi12           | X6CrTi12           | Z 3 CT 12        | 409           |
|                                |                              | 1.4016 | X6Cr17             | X8Cr17             | Z 8 C 17         | 430           |
|                                |                              | 1.4104 | X14CrMoS17         | X10CrS17           | Z 13 CF 17       | 430F          |
|                                | Martensitic stainless steel  | 1.4006 | X12Cr13            | X12Cr13            | Z 10 C 13        | 410           |
|                                |                              | 1.4005 | X12CrS13           | X12CrS13           | Z 11 CF 13       | 416           |
|                                |                              | 1.4021 | X20Cr13            | X20Cr13            | Z 20 C 13        | 420           |
|                                |                              | 1.4028 | X30Cr13            | X30Cr13            | Z 30 C 13        | 420           |
|                                |                              | 1.4057 | X17CrNi16-2        | X16CrNi16          | Z 15 CN 16-02    | 431           |
|                                |                              | 1.4125 | X105CrMo17         |                    | Z 100 CD 17      | 440C          |
|                                | Precipitation hardening      | 1.4542 | X5CrNiCuNb16-4     |                    | Z 7 CNU 15-05    | 630           |
| <b>M</b><br>STAINLESS STEEL    | Austenitic                   | 1.4319 | X3CrNi17-8         | X10CrNi1809        |                  | 302           |
|                                |                              | 1.4305 | X8CrNiS18-9        | X10CrNiS1809       | Z 8 CNF 18-09    | 303           |
|                                |                              | 1.4301 | X5CrNi18-10        | X5CrNi1810         | Z 4 CN 19-10 FF  | 304           |
|                                |                              | 1.4306 | X2CrNi19-11        | X2CrNi1811         | Z 1 CN 18-12     | 304L          |
|                                |                              | 1.4303 | X4CrNi18-12        | X8CrNi1812         | Z 5 CN 18-11 FF  | 305           |
|                                |                              | 1.4828 | X15CrNiSi20-12     | X16CrNi2314        | Z 9 CN 24-13     | 309           |
|                                |                              | 1.4841 | X15CrNiSi25-20     | X22CrNiSi2520      | Z 15 CNS 25-20   | 310           |
|                                |                              | 1.4401 | X5CrNiMo17-12-2    | X5CrNiMo1712       | Z 3 CND 17-11-01 | 316           |
|                                |                              | 1.4404 | X2CrNiMo17-12-2    | X2CrNiMo1712       | Z 2 CND 17-12    | 316L          |
|                                |                              | 1.4541 | X6CrNiTi18-10      | X6CrNiTi1811       | Z 6 CNT 18-10    | 321           |
|                                |                              | 1.4550 | X6CrNiNb18-10      | X6CrNiNb1811       | Z 6 CNNb 18-10   | 347           |
|                                | Duplex                       | 1.4462 | X2CrNiMoN22-5-3    | X2CrNiMoN22-5-3    | Z 3 CND 22-05 Az | S31803        |
|                                |                              | 1.4501 | X2CrNiMoCuWN25-7-4 | X2CrNiMoCuWN25-7-4 |                  | S32760        |
| <b>K</b><br>CAST IRON          | Grey cast iron               | 0.6010 | GG10               | G10                | Ft10D            | A48-20B       |
|                                |                              | 0.6015 | GG15               | G15                | Ft15D            | A48-25B       |
|                                |                              | 0.6020 | GG20               | G20                | Ft20D            | A48-30B       |
|                                |                              | 0.6025 | GG25               | G25                | Ft25D            | A48-40B       |
|                                |                              | 0.6030 | GG30               | G30                | Ft30D            | A48-45B       |
|                                |                              | 0.6035 | GG35               | G35                | Ft35D            | A48-50B       |
|                                |                              | 0.6040 | GG40               | G40                | Ft40D            | A48-60B       |
|                                | Nodular cast iron / tempered | 0.7040 | GGG40              | GS400-12           | FGS400-12        | 60-40-18      |
|                                |                              | 0.7050 | GGG50              | GS500-7            | FGS500-7         | 65-45-12      |
|                                |                              | 0.7060 | GGG60              | GS600-3            | FGS600-3         | 80-55-06      |
|                                |                              | 0.7070 | GGG70              | GS700-2            | FGS700-2         | 100-70-03     |
|                                | Malleable cast iron          | 0.8035 | GTW35-04           |                    |                  |               |
|                                |                              | 0.8055 | GTW55              |                    |                  |               |
|                                | Austempered ductile iron     |        | EN-GJS-800-8       |                    |                  |               |
|                                |                              |        | EN-GJS-1000-5      |                    |                  |               |
|                                |                              |        | EN-GJS-1200-2      |                    |                  |               |
|                                |                              |        | EN-GJS-1400-1      |                    |                  |               |
| <b>N</b><br>NON-FERROUS METALS | Pure aluminium               | 3.0205 | Al99               | 9001/1             | 1200 (A4)        | 1200          |
|                                |                              | 3.0305 | Al99.9             |                    |                  |               |
|                                | Al wrought alloys            | 3.0505 | AlMn0.5Mg0.5       |                    | 3105             |               |
|                                |                              | 3.0915 | AlFeSi             | 8011               | 8011             |               |
|                                |                              | 3.3315 | AlMg1              | 9005/1             | 5005 (AlMg1)     | 5005          |
|                                |                              | 3.3525 | AlMg2Mn0.3         |                    | 5251             | 5251          |
|                                |                              | 3.3527 | AlMg2Mn0.8         |                    | 5049             | 5049          |
|                                |                              | 3.3545 | AlMg4Mn            | 9005/4             | 5086 (AG4MC)     | 5086          |
|                                |                              | 3.3555 | AlMg5              |                    |                  |               |
|                                |                              | 3.0615 | AlMgSiPb           |                    | 6012             |               |

| Russia      | Japan         | China             | India          |               |                              |                                |
|-------------|---------------|-------------------|----------------|---------------|------------------------------|--------------------------------|
| GOST        | JIS           | GB                | IS             | MG Vergnano   | Application                  | ISO 513                        |
| 5ChNM       | SKT4          | 5CrNiMo           | T55Ni7Cr3Mo3V1 | P.5 (ricott.) | Hot-work                     | <b>P</b><br>STEEL              |
|             |               |                   |                | P.4 (ricott.) |                              |                                |
|             |               |                   |                | P.4 (ricott.) |                              |                                |
| 3Ch3M3F     | SKD7          | 4Cr3Mo3SiV        |                | P.4 (ricott.) |                              |                                |
| 4Ch5MFS     | SKD6          | 4Cr5MoSiV         | XT35Cr5Mo1V3   | P.4 (ricott.) |                              |                                |
| 4Ch5MF1S    | SKD61         | 4Cr5MoSiV1        | XT35Cr5Mo1V1   | P.4 (ricott.) |                              |                                |
| 4Ch2W5MF    | SKD4          | 30W4Cr2VA         |                | P.4 (ricott.) |                              |                                |
| 3Ch3W8F     | SKD5          | 3Cr2W8V           | XT33W9Cr3V4    | P.4 (ricott.) | Ferritic stainless steel     |                                |
|             | SUS405        | 0Cr13Al           | X04Cr13        | P.7           |                              |                                |
|             | SUS409TB      | 022Cr11NbTi       |                | P.7           |                              |                                |
|             | SUS430        | 1Cr17             | X07Cr17        | P.7           |                              |                                |
|             | SUS430F       | Y1Cr17            |                | P.7           |                              |                                |
|             | SUS410        | 1Cr13             | X12Cr12        | P.7           | Martensitic stainless steel  |                                |
|             | SUS416        | Y1Cr13            |                | P.7           |                              |                                |
| 20Ch13      | SUS420J1      | 2Cr13             | X20Cr13        | P.7           |                              |                                |
| 30Ch13      | SUS420J2      | 3Cr13             | X30Cr13        | P.7           |                              |                                |
| 14Ch17N2    | SUS431        | 1Cr17Ni2          | X15Cr16Ni2     | P.7           |                              |                                |
| 95Ch18      | SUS440C       | 108Cr17           | X108Cr17Mo     | P.7           | Precipitation hardening      |                                |
|             | SUS630/SCS24  | 0Cr17Ni4Cu4Nb     |                | M.2           |                              |                                |
|             | SUS302        |                   |                | M.1           | Austenitic                   | <b>M</b><br>STAINLESS STEEL    |
|             | SUS303        |                   |                | M.1           |                              |                                |
| 08Ch18N10   | SUS304        | 0Cr18Ni9          | X04Cr18Ni10    | M.1           |                              |                                |
| 03Ch18N11   | SUS304L/SCS19 | 00Cr19Ni10        | X02Cr19Ni10    | M.1           |                              |                                |
| 12Ch18N12T  | SUS305J1      | 1Cr18Ni12         |                | M.1           |                              |                                |
|             | SUH309        | 1Cr20Ni14Si2      | X15Cr24Ni13    | M.1           |                              |                                |
| 20Ch25N20S2 | SUH310        | 1Cr25Ni20Si2      | X20Cr25Ni20    | M.1           |                              |                                |
| 08Ch16N11M3 | SUS316        | 0Cr17Ni12Mo2      | X04Cr17Ni12Mo2 | M.1           |                              |                                |
|             | SUS316L       | 00Cr17Ni14Mo2     | X02Cr17Ni12Mo2 | M.1           |                              |                                |
| 08Ch18N10T  | SUS321        | 0Cr18Ni10Ti       | X04Cr18Ni10Ti  | M.1           |                              |                                |
| 08Ch18N12B  | SUS347        | 0Cr18Ni11Nb       | X04Cr18Ni10Nb  | M.1           |                              |                                |
|             | SUS329J3L     | 022Cr22Ni5Mo3N    |                | M.2           | Duplex                       |                                |
|             |               | 022Cr25Ni7Mo3WCuN |                | M.2           |                              |                                |
| Sc10        | FC10          |                   |                | K.1           | Grey cast iron               | <b>K</b><br>CAST IRON          |
| Sc15        | FC15          | HT150             | FG150          | K.1           |                              |                                |
| Sc20        | FC20          | HT200             | FG200          | K.1           |                              |                                |
| Sc25        | FC25          | HT250             | FG260          | K.1           |                              |                                |
| Sc30        | FC30          | HT300             | FG300          | K.1           |                              |                                |
| Sc35        | FC35          |                   |                | K.1           |                              |                                |
| Sc40        |               |                   |                | K.1           | Nodular cast iron / tempered |                                |
| VC 42-12    | FCD40         | QT400-15          |                | K.2           |                              |                                |
| VC 50-2     | FCD50         | QT500-7           | SG500/7        | K.2           |                              |                                |
| VC 60-2     | FCD60         | QT600-3           | SG600/3        | K.2           |                              |                                |
| VC 70-2     | FCD70         | QT700-2           | SG700/2        | K.2           | Malleable cast iron          |                                |
|             |               |                   |                | K.2           |                              |                                |
|             |               |                   |                | K.3           | Austempered ductile iron     |                                |
|             |               |                   |                | K.3           |                              |                                |
|             |               |                   |                | K.3           |                              |                                |
|             |               |                   |                | K.3           |                              |                                |
|             | A1200         |                   |                | N.1           | Pure aluminium               | <b>N</b><br>NON-FERROUS METALS |
|             |               |                   |                | N.1           | Al wrought alloys            |                                |
|             | A3105         |                   |                | N.2           |                              |                                |
|             |               |                   |                | N.2           |                              |                                |
|             | A5005         |                   |                | N.2           |                              |                                |
|             |               |                   |                | N.2           |                              |                                |
|             |               |                   |                | N.2           |                              |                                |
|             | A5086         |                   |                | N.2           |                              |                                |
|             | A5056         |                   |                | N.2           |                              |                                |
|             |               |                   |                | N.2           |                              |                                |

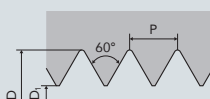
# Material examples

|                                         |                   |        | Germany                      | Italy            | France        | United States |
|-----------------------------------------|-------------------|--------|------------------------------|------------------|---------------|---------------|
| ISO 513                                 | Application       | W.Nr.  | DIN                          | UNI              | AFNOR         | AISI/SAE/ASTM |
| <b>N</b><br>NON-FERROUS METALS          | Al wrought alloys | 3.1255 | AlCuSiMn                     | 9002/3           | 2014          | 2014          |
|                                         |                   | 3.1325 | AlCuMg1                      | 9002/2           | 2017 A (AU4G) | 2017A         |
|                                         |                   | 3.1355 | AlCuMg2                      | 9002/4           | 2024 (AU4G1)  | 2024          |
|                                         |                   | 3.1645 | AlCuMgPb                     | 9002/8           | 2030 (AU4PB)  | 2030          |
|                                         |                   | 3.4335 | AlZn4.5Mg1                   | 9007/1           | 7020 (AZ5G)   | 7020          |
|                                         | Al casting alloys | 3.1371 | G-AlCu4TiMg                  |                  |               |               |
|                                         |                   | 3.2134 | G-AlSi5Cu1Mg                 |                  |               |               |
|                                         |                   | 3.3241 | G-AlMg3Si                    |                  |               |               |
|                                         |                   | 3.3261 | G-AlMg5Si                    |                  |               |               |
|                                         |                   | 3.3541 | G-AlMg3                      |                  |               |               |
|                                         |                   | 3.2373 | G-AlSi9Mg                    |                  |               |               |
|                                         |                   | 3.2381 | G-AlSi10Mg                   |                  |               |               |
|                                         |                   | 3.2383 | G-AlSi10Mg(Cu)               |                  |               |               |
|                                         | Pure copper       | 3.2581 | G-AlSi12                     |                  |               |               |
|                                         |                   | 3.2583 | G-AlSi12(Cu)                 |                  |               |               |
|                                         | Cu wrought alloys | 2.0060 | E-Cu57                       |                  |               | C11000        |
|                                         |                   | 2.0065 | E-Cu58                       | 5649             | CuA1          | C11000        |
|                                         |                   | 2.1525 | CuSi3Mn                      | CuSi3Mn1         |               | C65500        |
|                                         |                   | 2.0855 | CuNi2Si                      | CuNi2Si          |               | C64700        |
|                                         |                   | 2.1247 | CuBe2                        | Classe IV        |               | C17200        |
|                                         | Brass             | 2.1285 | CuCo2Be                      | Classe III       |               | C17510        |
|                                         |                   | 2.0240 | CuZn15                       |                  |               |               |
|                                         |                   | 2.0250 | CuZn20                       |                  |               |               |
|                                         |                   | 2.0265 | CuZn30                       |                  |               | C26000        |
|                                         |                   | 2.0280 | CuZn33                       |                  |               |               |
|                                         |                   | 2.0321 | CuZn37                       |                  |               | C27450        |
|                                         |                   | 2.0360 | CuZn40                       |                  |               | C28000        |
|                                         |                   | 2.0410 | CuZn44Pb2                    | CuZn43Pb2Al      |               | C38000        |
|                                         | Bronze            | 2.0550 | CuZn40Al2                    | CuZn37Mn3Al2PbSi |               | C67410        |
|                                         |                   | 2.1016 | CuSn4                        |                  |               |               |
|                                         |                   | 2.1020 | CuSn6                        |                  |               |               |
|                                         |                   | 2.1030 | CuSn8                        |                  |               |               |
|                                         |                   | 2.1086 | G-CuSn10Zn                   | 7013             | U-E12P7U-E8Z2 | C90500        |
|                                         |                   | 2.0978 | CuAl11Ni6Fe6                 | CuAl11Fe6Ni6     |               |               |
|                                         |                   | 2.0940 | CuAl10Fe                     | 5274             |               | C95400        |
|                                         |                   | 2.0882 | CuNi30Mn1Fe                  |                  |               |               |
|                                         |                   | 3.5312 | MgAl3Zn                      |                  |               |               |
|                                         |                   | 3.5632 | MgAl6Zn3                     |                  |               |               |
|                                         |                   | 3.5912 | MgAl9Zn1                     |                  |               |               |
|                                         |                   | 3.5161 | MgZn6Zr                      |                  |               |               |
| <b>S</b><br>SUPERALLOYS AND<br>TITANIUM | Pure titanium     | 3.7024 | Ti99.5                       |                  |               |               |
|                                         | Titanium alloys   | 3.7034 | Ti99.7                       |                  |               |               |
|                                         |                   | 3.7165 | TiAl6V4                      |                  | T-A6V         |               |
|                                         | Pure Nickel       | 3.7174 | TiAl6V4Sn2                   |                  |               |               |
|                                         |                   | 1.3911 | RNi24                        |                  |               |               |
|                                         |                   | 1.3926 | RNi12                        |                  |               |               |
|                                         |                   | 2.4858 | NiCr21Mo (Incoloy 825)       |                  |               |               |
|                                         | Nickel alloys     | 2.4668 | NiCr19Fe19NbMo (Inconel 718) |                  | INCONEL 718   |               |
|                                         |                   | 2.4630 | Ni-Cr20Ti (Nimonic 75)       |                  | NIMONIC 75    |               |
|                                         |                   | 2.4665 | NiCr22Fe18Mo (Hastelloy X)   |                  |               |               |
| <b>H</b><br>HARDENED<br>MATERIALS       | Ball bearing      | 1.3505 | 100Cr6                       | 100Cr6           | 100C6         | 52100         |
|                                         |                   | 1.3536 | 100CrMo6                     | 100CrMo7         | 100CD7        | 3             |
|                                         | Hot-work          | 1.2767 | 45NiCrMo16                   | 40NiCrMoV16 KU   | Y35NCD16      |               |
|                                         |                   | 1.2713 | 55NiCrMoV7                   | 55NiCrMoV7 KU    | 55NiCrMoV7    | L6            |
|                                         |                   | 1.2311 |                              | 35CrMo8 KU       |               |               |
|                                         |                   | 1.2365 | 32CrMoV12-28                 | 30CrMoV12-27 KU  | 32CDV12-28    | H10           |
|                                         |                   | 1.2343 | X38CrMoV5-1                  | X37CrMoV5-1 KU   | Z38CDV5       | H11           |
|                                         |                   | 1.2344 | X40CrMoV5-1                  | X40CrMoV5-1-1 KU | Z40CDV5       | H13           |
|                                         |                   | 1.2567 | X30WCrV5-3                   | X30WCrV5-3 KU    | Z32WCV5       | H14           |
|                                         |                   | 1.2581 | X30WCrV9-3                   | X30WCrV9-3 KU    | Z30WCV9       | H21           |

| Russia   | Japan         | China      | India          |              |                   |                             |
|----------|---------------|------------|----------------|--------------|-------------------|-----------------------------|
| GOST     | JIS           | GB         | IS             | MG Vergnano  | Application       | ISO 513                     |
|          | A2014         |            |                | N.2          | Al wrought alloys | NON-FERROUS METALS          |
|          | A2017         |            |                | N.2          |                   |                             |
|          | A2024         |            |                | N.2          |                   |                             |
|          |               |            |                | N.2          | Al casting alloys |                             |
|          | A7N01         |            |                | N.2          |                   |                             |
|          | AC1B          |            |                | N.2          |                   |                             |
|          | AC4D          |            |                | N.3          |                   |                             |
|          |               |            |                | N.2          |                   |                             |
|          |               |            |                | N.2          |                   |                             |
|          |               |            |                | N.2          |                   |                             |
|          | AC4A          |            |                | N.3          |                   |                             |
|          |               |            |                | N.4          |                   |                             |
|          | ADC3          |            |                | N.4          |                   |                             |
|          | AC3A          |            |                | N.4          |                   |                             |
|          | ADC1          |            |                | N.4          |                   |                             |
|          | C1100         |            |                | N.5          | Pure copper       |                             |
|          | C1100         |            |                | N.5          |                   |                             |
|          |               |            |                | N.6          | Cu wrought alloys |                             |
|          |               |            |                | N.6          |                   |                             |
|          |               |            |                | N.6          |                   |                             |
|          |               |            |                | N.6          |                   |                             |
|          |               |            |                | N.6          | Brass             |                             |
|          | C2600         |            |                | N.6          |                   |                             |
|          |               |            |                | N.6          |                   |                             |
|          | C2700         |            |                | N.6          |                   |                             |
|          | C2800         |            |                | N.7          |                   |                             |
|          |               |            |                | N.7          |                   |                             |
|          |               |            |                | N.7          |                   |                             |
|          |               |            |                | N.6          | Bronze            |                             |
|          |               |            |                | N.6          |                   |                             |
|          |               |            |                | N.6          |                   |                             |
|          | CAC403C (BC3) |            |                | N.7          |                   |                             |
|          |               |            |                | N.8          |                   |                             |
|          | CAC702C       |            |                | N.8          |                   |                             |
|          |               |            |                | N.8          |                   |                             |
|          |               |            |                | N.9          |                   |                             |
|          |               |            |                | N.9          |                   |                             |
|          |               |            |                | N.9          |                   |                             |
|          |               |            |                | N.10         |                   |                             |
|          |               |            |                | S.1          | Pure titanium     | SUPERALLOYS AND<br>TITANIUM |
|          |               |            |                | S.1          |                   |                             |
|          |               |            |                | S.2          | Titanium alloys   |                             |
|          |               |            |                | S.2          |                   |                             |
|          |               |            |                | S.3          | Pure Nickel       |                             |
|          |               |            |                | S.3          |                   |                             |
|          | NCF825        |            |                | S.4          | Nickel alloys     |                             |
|          |               |            |                | S.4          |                   |                             |
|          |               |            |                | S.4          |                   |                             |
|          |               |            |                | S.4          |                   |                             |
| SChCh15  | SUJ2/SUJ4     | GCr15      |                | H.2 (bonif.) | Ball bearing      | HARDENED<br>MATERIALS       |
|          |               |            |                | H.2 (bonif.) |                   |                             |
|          | SKT6          |            |                | H.1 (bonif.) | Hot-work          |                             |
| 5ChNM    | SKT4          | 5CrNiMo    | T55Ni7Cr3Mo3V1 | H.1 (bonif.) |                   |                             |
|          |               |            |                | H.1 (bonif.) |                   |                             |
| 3Ch3M3F  | SKD7          | 4Cr3Mo3SiV |                | H.1 (bonif.) |                   |                             |
| 4Ch5MFS  | SKD6          | 4Cr5MoSiV  | XT35Cr5Mo1V3   | H.1 (bonif.) |                   |                             |
| 4Ch5MF1S | SKD61         | 4Cr5MoSiV1 | XT35Cr5Mo1V1   | H.1 (bonif.) |                   |                             |
| 4Ch2W5MF | SKD4          | 30W4Cr2VA  |                | H.1 (bonif.) |                   |                             |
| 3Ch3W8F  | SKD5          | 3Cr2W8V    | XT33W9Cr3V4    | H.1 (bonif.) |                   |                             |

# Drill size cutting taps

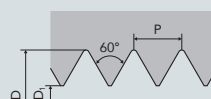
**M**



**ISO Metric coarse thread  
DIN 13**

| D                  | Pitch<br>[mm] | Maximum core<br>diam.<br>(tol. 6H)[mm] D1 | Drill size*<br>[mm] |
|--------------------|---------------|-------------------------------------------|---------------------|
| M 1                | 0,25          | 0,785 <sup>(1)</sup>                      | 0,75                |
| 1,1                | 0,25          | 0,885 <sup>(1)</sup>                      | 0,85                |
| 1,2                | 0,25          | 0,985 <sup>(1)</sup>                      | 0,95                |
| 1,4                | 0,3           | 1,142 <sup>(1)</sup>                      | 1,1                 |
| 1,6                | 0,35          | 1,321                                     | 1,25                |
| 1,7 <sup>(3)</sup> | 0,35          | 1,421                                     | 1,35                |
| 1,8                | 0,35          | 1,521                                     | 1,45                |
| 2                  | 0,4           | 1,679                                     | 1,6                 |
| 2,2                | 0,45          | 1,838                                     | 1,75                |
| 2,3 <sup>(3)</sup> | 0,4           | 1,938                                     | 1,9                 |
| 2,5                | 0,45          | 2,138                                     | 2,05                |
| 2,6 <sup>(3)</sup> | 0,45          | 2,238                                     | 2,1                 |
| 3                  | 0,5           | 2,599                                     | 2,5                 |
| 3,5                | 0,6           | 3,010                                     | 2,9                 |
| 4                  | 0,7           | 3,422                                     | 3,3                 |
| 4,5                | 0,75          | 3,878                                     | 3,7                 |
| 5                  | 0,8           | 4,334                                     | 4,2                 |
| 6                  | 1             | 5,153                                     | 5                   |
| 7                  | 1             | 6,153                                     | 6                   |
| 8                  | 1,25          | 6,912                                     | 6,8                 |
| 9                  | 1,25          | 7,912                                     | 7,8                 |
| 10                 | 1,5           | 8,676                                     | 8,5                 |
| 11                 | 1,5           | 9,676                                     | 9,5                 |
| 12                 | 1,75          | 10,441                                    | 10,2                |
| 14                 | 2             | 12,210                                    | 12                  |
| 16                 | 2             | 14,210                                    | 14                  |
| 18                 | 2,5           | 15,744                                    | 15,5                |
| 20                 | 2,5           | 17,744                                    | 17,5                |
| 22                 | 2,5           | 19,744                                    | 19,5                |
| 24                 | 3             | 21,252                                    | 21                  |
| 27                 | 3             | 24,252                                    | 24                  |
| 30                 | 3,5           | 26,771                                    | 26,5                |
| 33                 | 3,5           | 29,771                                    | 29,5                |
| 36                 | 4             | 32,270                                    | 32                  |
| 39                 | 4             | 35,270                                    | 35                  |
| 42                 | 4,5           | 37,799                                    | 37,5                |
| 45                 | 4,5           | 40,799                                    | 40,5                |
| 48                 | 5             | 43,297                                    | 43                  |
| 52                 | 5             | 47,297                                    | 47                  |
| 56                 | 5,5           | 50,796                                    | 50,5                |
| 60 <sup>(3)</sup>  | 5,5           | 54,796                                    | 54,5                |
| 64 <sup>(3)</sup>  | 6             | 58,305                                    | 58                  |
| 68 <sup>(3)</sup>  | 6             | 62,305                                    | 62                  |

**MF**



**ISO Metric fine thread  
DIN 13**

| D                  | Pitch<br>[mm] | Maximum core<br>diam.<br>(tol. 6H)[mm] D1 | Drill size*<br>[mm] | D    | Pitch<br>[mm] | Maximum core<br>diam.<br>(tol. 6H)[mm] D1 | Drill size*<br>[mm] |
|--------------------|---------------|-------------------------------------------|---------------------|------|---------------|-------------------------------------------|---------------------|
| M 2 <sup>(3)</sup> | 0,25          | 1,774 <sup>(2)</sup>                      | 1,75                | M 25 | 1             | 24,153                                    | 24                  |
| 2,3 <sup>(3)</sup> | 0,25          | 2,085                                     | 2,05                | 25   | 1,5           | 23,676                                    | 23,5                |
| 2,5                | 0,35          | 2,221                                     | 2,15                | 25   | 2             | 23,210                                    | 23                  |
| 3                  | 0,35          | 2,721                                     | 2,65                | 26   | 1,5           | 24,676                                    | 24,5                |
| 3,5                | 0,35          | 3,221                                     | 3,15                | 27   | 1             | 26,153                                    | 26                  |
| 4                  | 0,5           | 3,599                                     | 3,5                 | 27   | 1,5           | 25,676                                    | 25,5                |
| 4,5                | 0,5           | 4,099                                     | 4                   | 27   | 2             | 25,210                                    | 25                  |
| 5                  | 0,5           | 4,599                                     | 4,5                 | 28   | 1             | 27,153                                    | 27                  |
| 5,5                | 0,5           | 5,099                                     | 5                   | 28   | 1,5           | 26,676                                    | 26,5                |
| 6                  | 0,75          | 5,378                                     | 5,2                 | 28   | 2             | 26,210                                    | 26                  |
| 7                  | 0,75          | 6,378                                     | 6,2                 | 30   | 1             | 29,153                                    | 29                  |
| 8                  | 0,75          | 7,378                                     | 7,2                 | 30   | 1,5           | 28,676                                    | 28,5                |
| 8                  | 1             | 7,153                                     | 7                   | 30   | 2             | 28,210                                    | 28                  |
| 9                  | 0,75          | 8,378                                     | 8,2                 | 30   | 3             | 27,252                                    | 27                  |
| 9                  | 1             | 8,153                                     | 8                   | 32   | 1,5           | 30,676                                    | 30,5                |
| 10                 | 0,75          | 9,378                                     | 9,2                 | 32   | 2             | 30,210                                    | 30                  |
| 10                 | 1             | 9,153                                     | 9                   | 33   | 1,5           | 31,676                                    | 31,5                |
| 10                 | 1,25          | 8,912                                     | 8,8                 | 33   | 2             | 31,210                                    | 31                  |
| 11                 | 0,75          | 10,378                                    | 10,2                | 33   | 3             | 30,252                                    | 30                  |
| 11                 | 1             | 10,153                                    | 10                  | 35   | 1,5           | 33,676                                    | 33,5                |
| 12 <sup>(3)</sup>  | 0,75          | 11,378                                    | 11,2                | 36   | 1,5           | 34,676                                    | 34,5                |
| 12                 | 1             | 11,153                                    | 11                  | 36   | 2             | 34,210                                    | 34                  |
| 12                 | 1,25          | 10,912                                    | 10,8                | 36   | 3             | 33,252                                    | 33                  |
| 12                 | 1,5           | 10,676                                    | 10,5                | 38   | 1,5           | 36,676                                    | 36,5                |
| 14                 | 1             | 13,153                                    | 13                  | 39   | 1,5           | 37,676                                    | 37,5                |
| 14                 | 1,25          | 12,912                                    | 12,8                | 39   | 2             | 37,210                                    | 37                  |
| 14                 | 1,5           | 12,676                                    | 12,5                | 39   | 3             | 36,252                                    | 36                  |
| 15                 | 1             | 14,153                                    | 14                  | 40   | 1,5           | 38,676                                    | 38,5                |
| 15                 | 1,5           | 13,676                                    | 13,5                | 40   | 2             | 38,210                                    | 38                  |
| 16                 | 1             | 15,153                                    | 15                  | 40   | 3             | 37,252                                    | 37                  |
| 16                 | 1,5           | 14,676                                    | 14,5                | 42   | 1,5           | 40,676                                    | 40,5                |
| 17                 | 1             | 16,153                                    | 16                  | 42   | 2             | 40,210                                    | 40                  |
| 17                 | 1,5           | 15,676                                    | 15,5                | 42   | 3             | 39,252                                    | 39                  |
| 18                 | 1             | 17,153                                    | 17                  | 45   | 1,5           | 43,676                                    | 43,5                |
| 18                 | 1,5           | 16,676                                    | 16,5                | 45   | 2             | 43,210                                    | 43                  |
| 18                 | 2             | 16,210                                    | 16                  | 45   | 3             | 42,252                                    | 42                  |
| 20                 | 1             | 19,153                                    | 19                  | 48   | 1,5           | 46,676                                    | 46,5                |
| 20                 | 1,5           | 18,676                                    | 18,5                | 48   | 2             | 46,210                                    | 46                  |
| 20                 | 2             | 18,210                                    | 18                  | 48   | 3             | 45,252                                    | 45                  |
| 22                 | 1             | 21,153                                    | 21                  | 50   | 1,5           | 48,676                                    | 48,5                |
| 22                 | 1,5           | 20,676                                    | 20,5                | 50   | 2             | 48,210                                    | 48                  |
| 22                 | 2             | 20,210                                    | 20                  | 50   | 3             | 47,252                                    | 47                  |
| 24                 | 1             | 23,153                                    | 23                  | 52   | 1,5           | 50,676                                    | 50,5                |
| 24                 | 1,5           | 22,676                                    | 22,5                | 52   | 2             | 50,210                                    | 50                  |
| 24                 | 2             | 22,210                                    | 22                  | 52   | 3             | 49,252                                    | 49                  |

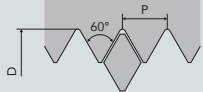
(\*) Drill size according to DIN 336

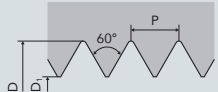
(<sup>1</sup>) Tolerance 5H

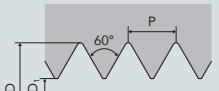
(<sup>2</sup>) Tolerance 4H

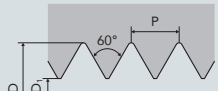
(<sup>3</sup>) Size not included in DIN 336

# Drill size cutting taps

| <div>EG-M</div>  |                     |
|---------------------------------------------------------------------------------------------------|---------------------|
| ISO Metric coarse thread<br>DIN 8140 Part 2                                                       |                     |
| D                                                                                                 | Drill size*<br>[mm] |
| EG-M 3                                                                                            | 3,15                |
| 4                                                                                                 | 4,2                 |
| 5                                                                                                 | 5,25                |
| 6                                                                                                 | 6,3                 |
| 8                                                                                                 | 8,4                 |
| 10                                                                                                | 10,5                |
| 12                                                                                                | 12,5                |
| 14                                                                                                | 14,5                |
| 16                                                                                                | 16,5                |

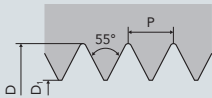
| <div>8-UN</div>  |                |                                           |                     |
|-----------------------------------------------------------------------------------------------------|----------------|-------------------------------------------|---------------------|
| 8-UN thread<br>ASME B1.1                                                                            |                |                                           |                     |
| D                                                                                                   | Pitch<br>[TPI] | Maximum core<br>diam.(tol. 3B)<br>D1 [mm] | Drill size*<br>[mm] |
| 1 1/8"                                                                                              | 8              | 25,519                                    | 25,4                |
| 1 1/4"                                                                                              | 8              | 28,694                                    | 28,6                |
| 1 3/8"                                                                                              | 8              | 31,869                                    | 31,8                |
| 1 1/2"                                                                                              | 8              | 35,044                                    | 35,0                |
| 1 5/8"                                                                                              | 8              | 38,219                                    | 38,1                |
| 1 3/4"                                                                                              | 8              | 41,394                                    | 41,3                |
| 1 7/8"                                                                                              | 8              | 44,569                                    | 44,5                |
| 2"                                                                                                  | 8              | 47,744                                    | 47,7                |

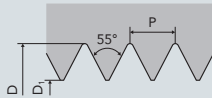
| <div>UNC</div>  |                |                                          |                     |
|---------------------------------------------------------------------------------------------------|----------------|------------------------------------------|---------------------|
| Unified coarse thread<br>UNC ASME - B1.1                                                          |                |                                          |                     |
| D                                                                                                 | Pitch<br>[TPI] | Maximum core<br>diam.(tol. 3B)<br>[mm]D1 | Drill size*<br>[mm] |
| Nr. 1                                                                                             | 64             | 1,582                                    | 1,55                |
| Nr. 2                                                                                             | 56             | 1,872                                    | 1,85                |
| Nr. 3                                                                                             | 48             | 2,146                                    | 2,1                 |
| Nr. 4                                                                                             | 40             | 2,385                                    | 2,35                |
| Nr. 5                                                                                             | 40             | 2,697                                    | 2,65                |
| Nr. 6                                                                                             | 32             | 2,896                                    | 2,85                |
| Nr. 8                                                                                             | 32             | 3,528                                    | 3,5                 |
| Nr. 10                                                                                            | 24             | 3,950                                    | 3,9                 |
| Nr. 12                                                                                            | 24             | 4,590                                    | 4,5                 |
| 1/4"                                                                                              | 20             | 5,250                                    | 5,1                 |
| 5/16"                                                                                             | 18             | 6,680                                    | 6,6                 |
| 3/8"                                                                                              | 16             | 8,082                                    | 8                   |
| 7/16"                                                                                             | 14             | 9,441                                    | 9,4                 |
| 1/2"                                                                                              | 13             | 10,881                                   | 10,8                |
| 9/16"                                                                                             | 12             | 12,301                                   | 12,2                |
| 5/8"                                                                                              | 11             | 13,693                                   | 13,5                |
| 3/4"                                                                                              | 10             | 16,624                                   | 16,5                |
| 7/8"                                                                                              | 9              | 19,520                                   | 19,5                |
| 1"                                                                                                | 8              | 22,344                                   | 22,25               |
| 1 1/8"                                                                                            | 7              | 25,082                                   | 25                  |
| 1 1/4"                                                                                            | 7              | 28,258                                   | 28                  |
| 1 3/8"                                                                                            | 6              | 30,851                                   | 30,75               |
| 1 1/2"                                                                                            | 6              | 34,026                                   | 34                  |
| 1 3/4"                                                                                            | 5              | 39,560                                   | 39,5                |
| 2"                                                                                                | 4,5            | 45,367                                   | 45                  |

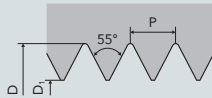
| <div>UNF</div>  |                |                                          |                     |
|-----------------------------------------------------------------------------------------------------|----------------|------------------------------------------|---------------------|
| Unified fine thread<br>UNF ASME - B1.1                                                              |                |                                          |                     |
| D                                                                                                   | Pitch<br>[TPI] | Maximum core<br>diam.(tol. 3B)<br>[mm]D1 | Drill size*<br>[mm] |
| Nr. 0                                                                                               | 80             | 1,306                                    | 1,25                |
| Nr. 1                                                                                               | 72             | 1,613                                    | 1,55                |
| Nr. 2                                                                                               | 64             | 1,913                                    | 1,85                |
| Nr. 3                                                                                               | 56             | 2,197                                    | 2,15                |
| Nr. 4                                                                                               | 48             | 2,459                                    | 2,4                 |
| Nr. 5                                                                                               | 44             | 2,741                                    | 2,7                 |
| Nr. 6                                                                                               | 40             | 3,012                                    | 2,95                |
| Nr. 8                                                                                               | 36             | 3,597                                    | 3,5                 |
| Nr. 10                                                                                              | 32             | 4,168                                    | 4,1                 |
| Nr. 12                                                                                              | 28             | 4,717                                    | 4,6                 |
| 1/4"                                                                                                | 28             | 5,563                                    | 5,5                 |
| 5/16"                                                                                               | 24             | 6,995                                    | 6,9                 |
| 3/8"                                                                                                | 24             | 8,565                                    | 8,5                 |
| 7/16"                                                                                               | 20             | 9,947                                    | 9,9                 |
| 1/2"                                                                                                | 20             | 11,524                                   | 11,5                |
| 9/16"                                                                                               | 18             | 12,969                                   | 12,9                |
| 5/8"                                                                                                | 18             | 14,554                                   | 14,5                |
| 3/4"                                                                                                | 16             | 17,546                                   | 17,5                |
| 7/8"                                                                                                | 14             | 20,493                                   | 20,4                |
| 1"                                                                                                  | 12             | 23,363                                   | 23,25               |
| 1 1/8"                                                                                              | 12             | 26,538                                   | 26,5                |
| 1 1/4"                                                                                              | 12             | 29,713                                   | 29,5                |
| 1 3/8"                                                                                              | 12             | 32,888                                   | 32,75               |
| 1 1/2"                                                                                              | 12             | 36,063                                   | 36                  |

(\*) Drill size according to DIN 336

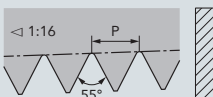
# Drill size cutting taps

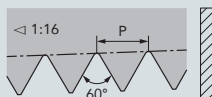
| <div>BSW</div>  |                |                                  |                    |
|--------------------------------------------------------------------------------------------------|----------------|----------------------------------|--------------------|
| Whitworth thread<br>BSW - BS 84                                                                  |                |                                  |                    |
| D                                                                                                | Pitch<br>[TPI] | Maximum<br>core diam.<br>[mm] D1 | Drill size<br>[mm] |
| 3/32"                                                                                            | 48             | 1,912                            | 1,9                |
| 1/8"                                                                                             | 40             | 2,591                            | 2,55               |
| 5/32"                                                                                            | 32             | 3,214                            | 3,2                |
| 3/16"                                                                                            | 24             | 3,744                            | 3,7                |
| 7/32"                                                                                            | 24             | 4,539                            | 4,5                |
| 1/4"                                                                                             | 20             | 5,156                            | 5,1                |
| 5/16"                                                                                            | 18             | 6,589                            | 6,5                |
| 3/8"                                                                                             | 16             | 7,988                            | 7,9                |
| 7/16"                                                                                            | 14             | 9,332                            | 9,25               |
| 1/2"                                                                                             | 12             | 10,589                           | 10,5               |
| 9/16"                                                                                            | 12             | 12,177                           | 12                 |
| 5/8"                                                                                             | 11             | 13,559                           | 13,5               |
| 3/4"                                                                                             | 10             | 16,485                           | 16,4               |
| 7/8"                                                                                             | 9              | 19,355                           | 19,25              |
| 1"                                                                                               | 8              | 22,149                           | 22                 |
| 1 1/8"                                                                                           | 7              | 24,831                           | 24,75              |
| 1 1/4"                                                                                           | 7              | 28,006                           | 27,75              |
| 1 3/8"                                                                                           | 6              | 30,528                           | 30,3               |
| 1 1/2"                                                                                           | 6              | 33,703                           | 33,5               |
| 1 5/8"                                                                                           | 5              | 35,961                           | 35,5               |
| 1 3/4"                                                                                           | 5              | 39,136                           | 39                 |
| 1 7/8"                                                                                           | 4,5            | 41,702                           | 41,5               |
| 2"                                                                                               | 4,5            | 44,877                           | 44,5               |
| 2 1/4"                                                                                           | 4              | 50,465                           | 50                 |
| 2 1/2"                                                                                           | 4              | 56,815                           | 56,3               |
| 2 3/4"                                                                                           | 3,5            | 62,182                           | 61,5               |
| 3"                                                                                               | 3,5            | 68,532                           | 68                 |

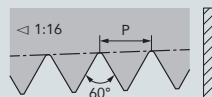
| <div>G</div>  |                |                                  |                     |
|------------------------------------------------------------------------------------------------|----------------|----------------------------------|---------------------|
| Whitworth pipe thread<br>EN - ISO 228                                                          |                |                                  |                     |
| D                                                                                              | Pitch<br>[TPI] | Maximum<br>core diam.<br>[mm] D1 | Drill size*<br>[mm] |
| G 1/8"                                                                                         | 28             | 8,848                            | 8,8                 |
| 1/4"                                                                                           | 19             | 11,890                           | 11,8                |
| 3/8"                                                                                           | 19             | 15,395                           | 15,25               |
| 1/2"                                                                                           | 14             | 19,172                           | 19                  |
| 5/8"                                                                                           | 14             | 21,128                           | 21                  |
| 3/4"                                                                                           | 14             | 24,658                           | 24,5                |
| 7/8"                                                                                           | 14             | 28,418                           | 28,25               |
| 1"                                                                                             | 11             | 30,931                           | 30,75               |
| 1 1/8"                                                                                         | 11             | 35,579                           | 35,5                |
| 1 1/4"                                                                                         | 11             | 39,592                           | 39,5                |
| 1 3/8"                                                                                         | 11             | 42,005                           | 41,9                |
| 1 1/2"                                                                                         | 11             | 45,485                           | 45,25               |
| 1 3/4"                                                                                         | 11             | 51,428                           | 51                  |
| 2"                                                                                             | 11             | 57,296                           | 57                  |
| 2 1/4"                                                                                         | 11             | 63,392                           | 63,3                |
| 2 3/8"                                                                                         | 11             | 67,080                           | 67                  |
| 2 1/2"                                                                                         | 11             | 72,866                           | 72,8                |
| 2 3/4"                                                                                         | 11             | 79,216                           | 79,1                |
| 3"                                                                                             | 11             | 85,566                           | 85,5                |
| 3 1/4"                                                                                         | 11             | 91,662                           | 91,5                |
| 3 1/2"                                                                                         | 11             | 98,012                           | 98                  |
| 3 3/4"                                                                                         | 11             | 104,362                          | 104                 |
| 4"                                                                                             | 11             | 110,712                          | 110,5               |

| <div>Rp (BSPP)</div>  |                |                               |                     |
|----------------------------------------------------------------------------------------------------------|----------------|-------------------------------|---------------------|
| Rp thread (BSPP)<br>DIN EN 10226-1                                                                       |                |                               |                     |
| D                                                                                                        | Pitch<br>[TPI] | Maximum core<br>diam. [mm] D1 | Drill size*<br>[mm] |
| 1/8"                                                                                                     | 28             | 8,637                         | 8,6                 |
| 1/4"                                                                                                     | 19             | 11,549                        | 11,5                |
| 3/8"                                                                                                     | 19             | 15,054                        | 15,0                |
| 1/2"                                                                                                     | 14             | 18,773                        | 18,5                |
| 3/4"                                                                                                     | 14             | 24,259                        | 24,0                |

(\*) Prefori secondo DIN 336

| <div>Rc (BSPT)</div>  |                |                         |         |
|----------------------------------------------------------------------------------------------------------|----------------|-------------------------|---------|
| Conical gas thread Rc<br>(BSPT) - DIN EN 10226-2                                                         |                |                         |         |
| D                                                                                                        | Pitch<br>[TPI] | Drill size**<br>[mm] D1 | t1 [mm] |
| 1/16"                                                                                                    | 28             | 6,2                     | 11,9    |
| 1/8"                                                                                                     | 28             | 8,2                     | 11,9    |
| 1/4"                                                                                                     | 19             | 11                      | 17,7    |
| 3/8"                                                                                                     | 19             | 14,5                    | 18,1    |
| 1/2"                                                                                                     | 14             | 18                      | 24      |
| 3/4"                                                                                                     | 14             | 23,5                    | 25,3    |
| 1"                                                                                                       | 11             | 29,5                    | 30,6    |
| 1 1/4"                                                                                                   | 11             | 38                      | 32,9    |
| 1 1/2"                                                                                                   | 11             | 44                      | 32,9    |
| 2"                                                                                                       | 11             | 55,5                    | 37,2    |

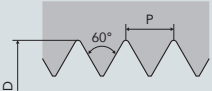
| <div>NPT</div>  |                |                         |         |
|----------------------------------------------------------------------------------------------------|----------------|-------------------------|---------|
| National pipe thread<br>NPT - ANSI B1.20.1                                                         |                |                         |         |
| D                                                                                                  | Pitch<br>[TPI] | Drill size**<br>[mm] D1 | t1 [mm] |
| 1/16"                                                                                              | 27             | 6,15                    | 12      |
| 1/8"                                                                                               | 27             | 8,5                     | 12      |
| 1/4"                                                                                               | 18             | 11                      | 17,5    |
| 3/8"                                                                                               | 18             | 14,5                    | 17,6    |
| 1/2"                                                                                               | 14             | 17,85                   | 22,9    |
| 3/4"                                                                                               | 14             | 23,2                    | 23      |
| 1"                                                                                                 | 11,5           | 29                      | 27,4    |
| 1 1/4"                                                                                             | 11,5           | 37,8                    | 28,1    |
| 1 1/2"                                                                                             | 11,5           | 44                      | 28,4    |
| 2"                                                                                                 | 11,5           | 56                      | 28,4    |

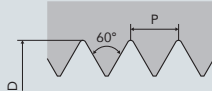
| <div>NPTF</div>  |                |                         |         |
|-------------------------------------------------------------------------------------------------------|----------------|-------------------------|---------|
| Dryseal national pipe thread<br>NPTF - ANSI B1.20.3                                                   |                |                         |         |
| D                                                                                                     | Pitch<br>[TPI] | Drill size**<br>[mm] D1 | t1 [mm] |
| 1/16"                                                                                                 | 27             | 6,15                    | 12      |
| 1/8"                                                                                                  | 27             | 8,5                     | 12      |
| 1/4"                                                                                                  | 18             | 11                      | 17,5    |
| 3/8"                                                                                                  | 18             | 14,5                    | 17,6    |
| 1/2"                                                                                                  | 14             | 17,8                    | 22,9    |
| 3/4"                                                                                                  | 14             | 23                      | 23      |
| 1"                                                                                                    | 11,5           | 29                      | 27,4    |
| 1 1/4"                                                                                                | 11,5           | 37,8                    | 28,1    |
| 1 1/2"                                                                                                | 11,5           | 43,8                    | 28,4    |
| 2"                                                                                                    | 11,5           | 56                      | 28,4    |

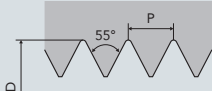
\*\* For conical threads tapered drill holes are preferable.  
Please request specific tables.

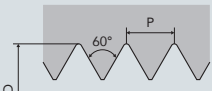


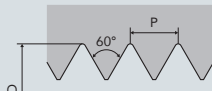
## Drill size forming taps

| <b>M</b>  |               |                    |
|--------------------------------------------------------------------------------------------|---------------|--------------------|
| <b>ISO Metric coarse thread<br/>DIN 13</b>                                                 |               |                    |
| D                                                                                          | Pitch<br>[mm] | Drill size<br>[mm] |
| M 2                                                                                        | 0,4           | 1,85 ± 0,03        |
| 2,5                                                                                        | 0,45          | 2,30 ± 0,03        |
| 3                                                                                          | 0,5           | 2,80 ± 0,03        |
| 3,5                                                                                        | 0,6           | 3,25 ± 0,03        |
| 4                                                                                          | 0,7           | 3,70 ± 0,03        |
| 5                                                                                          | 0,8           | 4,65 ± 0,03        |
| 6                                                                                          | 1             | 5,55 ± 0,05        |
| 8                                                                                          | 1,25          | 7,40 ± 0,05        |
| 10                                                                                         | 1,5           | 9,30 ± 0,05        |
| 12                                                                                         | 1,75          | 11,20 ± 0,05       |
| 14                                                                                         | 2             | 13,10 ± 0,05       |
| 16                                                                                         | 2             | 15,10 ± 0,05       |
| 18                                                                                         | 2,5           | 16,90 ± 0,05       |
| 20                                                                                         | 2,5           | 18,90 ± 0,05       |
| 24                                                                                         | 3             | 22,70 ± 0,05       |
| 27                                                                                         | 3             | 25,70 ± 0,05       |
| 30                                                                                         | 3,5           | 28,45 ± 0,05       |

| <b>MF</b>  |               |                    |
|---------------------------------------------------------------------------------------------|---------------|--------------------|
| <b>ISO Metric fine thread<br/>DIN 13</b>                                                    |               |                    |
| D                                                                                           | Pitch<br>[mm] | Drill size<br>[mm] |
| M 3                                                                                         | 0,35          | 2,85 ± 0,03        |
| 4                                                                                           | 0,5           | 3,80 ± 0,03        |
| 5                                                                                           | 0,5           | 4,80 ± 0,03        |
| 6                                                                                           | 0,75          | 5,65 ± 0,03        |
| 8                                                                                           | 1             | 7,55 ± 0,05        |
| 10                                                                                          | 1             | 9,55 ± 0,05        |
| 10                                                                                          | 1,25          | 9,40 ± 0,05        |
| 12                                                                                          | 1             | 11,55 ± 0,05       |
| 12                                                                                          | 1,25          | 11,40 ± 0,05       |
| 12                                                                                          | 1,5           | 11,30 ± 0,05       |
| 14                                                                                          | 1,25          | 13,40 ± 0,05       |
| 14                                                                                          | 1,5           | 13,30 ± 0,05       |
| 16                                                                                          | 1,5           | 15,30 ± 0,05       |
| 18                                                                                          | 1,5           | 17,30 ± 0,05       |
| 20                                                                                          | 1,5           | 19,30 ± 0,05       |

| <b>G</b>  |                |                    |
|----------------------------------------------------------------------------------------------|----------------|--------------------|
| <b>Whitworth Gas Whitworth<br/>EN - ISO 228</b>                                              |                |                    |
| D                                                                                            | Pitch<br>[TPI] | Drill size<br>[mm] |
| G 1/8"                                                                                       | 28             | 9,25 ± 0,05        |
| 1/4"                                                                                         | 19             | 12,50 ± 0,05       |
| 3/8"                                                                                         | 19             | 16,00 ± 0,05       |
| 1/2"                                                                                         | 14             | 20,00 ± 0,05       |
| 3/4"                                                                                         | 14             | 25,50 ± 0,05       |
| 1"                                                                                           | 11             | 32,00 ± 0,05       |

| <b>UNC</b>  |                |                    |
|------------------------------------------------------------------------------------------------|----------------|--------------------|
| <b>Unified coarse thread<br/>UNC ASME - B1.1</b>                                               |                |                    |
| D                                                                                              | Pitch<br>[TPI] | Drill size<br>[mm] |
| Nr. 8                                                                                          | 32             | 3,80 ± 0,03        |
| Nr. 10                                                                                         | 24             | 4,35 ± 0,03        |
| Nr. 12                                                                                         | 24             | 5,00 ± 0,03        |
| 1/4"                                                                                           | 20             | 5,80 ± 0,03        |
| 5/16"                                                                                          | 18             | 7,30 ± 0,05        |
| 3/8"                                                                                           | 16             | 8,80 ± 0,05        |
| 7/16"                                                                                          | 14             | 10,30 ± 0,05       |
| 1/2"                                                                                           | 13             | 11,80 ± 0,05       |
| 5/8"                                                                                           | 11             | 14,85 ± 0,05       |
| 3/4"                                                                                           | 10             | 17,90 ± 0,05       |

| <b>UNF</b>  |                |                    |
|------------------------------------------------------------------------------------------------|----------------|--------------------|
| <b>Unified fine thread<br/>UNF ASME - B1.1</b>                                                 |                |                    |
| D                                                                                              | Pitch<br>[TPI] | Drill size<br>[mm] |
| Nr. 8                                                                                          | 36             | 3,85 ± 0,03        |
| Nr. 10                                                                                         | 32             | 4,45 ± 0,03        |
| Nr. 12                                                                                         | 28             | 5,10 ± 0,03        |
| 1/4"                                                                                           | 28             | 5,95 ± 0,03        |
| 5/16"                                                                                          | 24             | 7,45 ± 0,05        |
| 3/8"                                                                                           | 24             | 9,05 ± 0,05        |
| 7/16"                                                                                          | 20             | 10,55 ± 0,05       |
| 1/2"                                                                                           | 20             | 12,15 ± 0,05       |
| 5/8"                                                                                           | 18             | 15,25 ± 0,05       |
| 3/4"                                                                                           | 16             | 18,35 ± 0,05       |

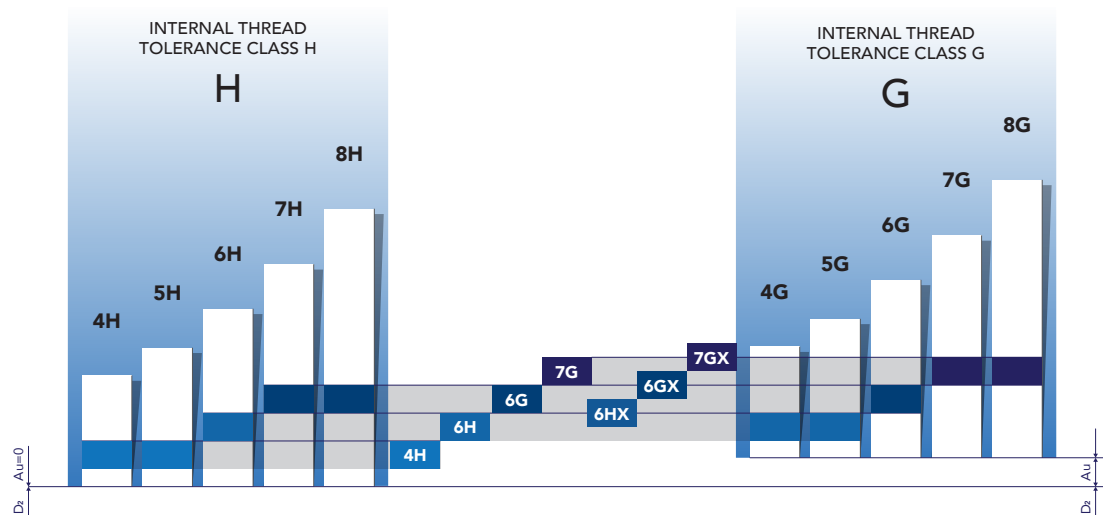
Other drill sizes = theoretical flank diameter + pitch/5

In order to obtain the requested tolerance, the formation of a complete internal thread and guarantee the tap tool life, it is important to respect the drill hole diameters and their tight tolerances.

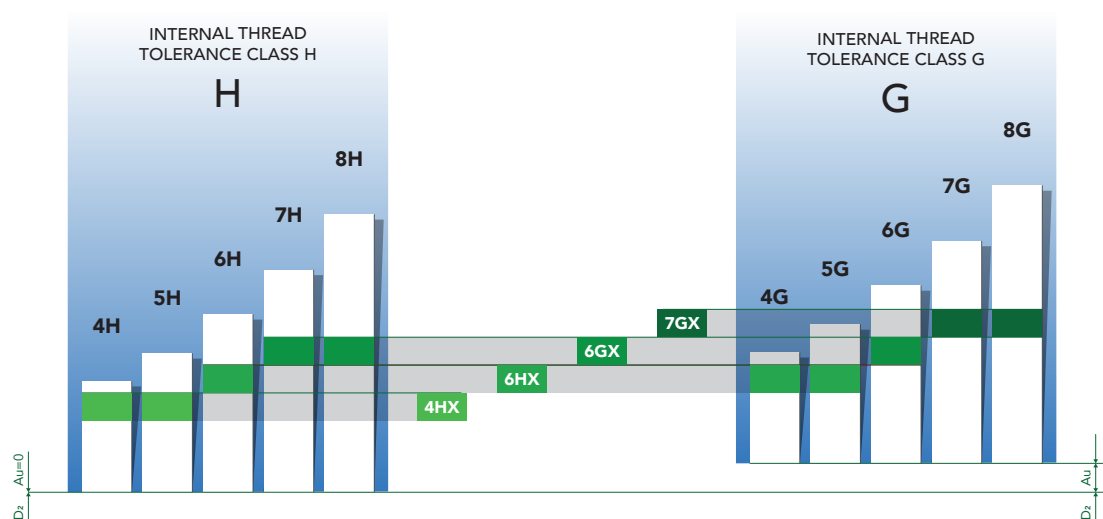
The core diameter of the internal thread obtained by forming is not only a function of the drill hole diameter but also depends on the workpiece material properties. For this reason the tolerance on the core diameter is 7H compared to 6H for cutting taps. For more detailed information see the DIN 13-50 standard.

# Tap tolerance

## CUTTING TAP TOLERANCE RANGE



## FORMING TAP TOLERANCE RANGE



Standard fit for a thread corresponds to tolerance class ISO 2/6H. For more precise fits, without allowance on thread flank, tolerance class ISO 1/4H must be chosen. ISO 3/6G is used in case of loose fits, with large allowance, which is often required for subsequent coatings.

Between classes 6H and 6G, as well as between classes 6G and 7G, tap manufacturers produce taps with tolerance 6HX and 6GX. These taps are used for tapping abrasive materials, such as cast iron or Al-Si alloys, in order to increase their tool life. Another important application is on forming taps, which create the thread by plastic deformation and not by cutting. In this case, due to the elastic return of the material, in order to obtain a thread 6H tolerance, a 6HX tap must be used.

The tolerances described above are collected in the European standard EN 22857.

# Tolerance table

| Nominal diameter (mm) |       | Pitch (mm) | Limits on pitch diameter (µm)* |           |           |      |
|-----------------------|-------|------------|--------------------------------|-----------|-----------|------|
|                       |       |            | Class                          |           |           |      |
| >                     | ≤     |            | 4H (ISO1)                      | 6H (ISO2) | 6G (ISO3) | 7G   |
| 0,99                  | 1,4   | 0,2        | +15                            | -         | -         | -    |
|                       |       |            | +5                             | -         | -         | -    |
|                       |       | 0,25       | +17                            | -         | -         | -    |
|                       |       |            | +6                             | -         | -         | -    |
|                       |       | 0,3        | +18                            | +30       | -         | -    |
| 1,4                   | 2,8   | 0,2        | +6                             | +18       | -         | -    |
|                       |       |            | +16                            | -         | -         | -    |
|                       |       | 0,25       | +5                             | -         | -         | -    |
|                       |       |            | +18                            | -         | -         | -    |
|                       |       | 0,35       | +6                             | -         | -         | -    |
| 2,8                   | 5,6   | 0,35       | +20                            | +34       | -         | -    |
|                       |       |            | +7                             | +20       | -         | -    |
|                       |       | 0,4        | +21                            | +36       | -         | -    |
|                       |       |            | +7                             | +21       | -         | -    |
|                       |       | 0,45       | +23                            | +38       | -         | -    |
| 5,6                   | 11,2  | 0,35       | +8                             | +23       | -         | -    |
|                       |       |            | +21                            | +36       | -         | -    |
|                       |       | 0,5        | +7                             | +21       | -         | -    |
|                       |       |            | +24                            | +40       | +56       | +70  |
|                       |       | 0,6        | +8                             | +24       | +40       | +55  |
| 11,2                  | 22,4  | 0,6        | +27                            | +45       | +63       | +81  |
|                       |       |            | +9                             | +27       | +45       | +63  |
|                       |       | 0,7        | +29                            | +48       | +67       | +86  |
|                       |       |            | +10                            | +29       | +48       | +67  |
|                       |       | 0,75       | +29                            | +48       | +67       | +86  |
| 22,4                  | 45    | 0,75       | +10                            | +29       | +48       | +67  |
|                       |       |            | +30                            | +50       | +70       | +90  |
|                       |       | 0,8        | +10                            | +30       | +50       | +70  |
|                       |       |            | +32                            | +53       | +74       | -    |
|                       |       | 0,75       | +11                            | +32       | +53       | -    |
| 45                    | 90    | 1          | +35                            | +59       | +83       | +107 |
|                       |       |            | +12                            | +35       | +59       | +83  |
|                       |       | 1,25       | +38                            | +63       | +88       | +113 |
|                       |       |            | +13                            | +38       | +63       | +88  |
|                       |       | 1,5        | +42                            | +70       | +98       | +126 |
| 90                    | 180   | 1,5        | +14                            | +42       | +70       | +98  |
|                       |       |            | +38                            | +63       | +88       | +113 |
|                       |       | 1,25       | +13                            | +38       | +63       | +88  |
|                       |       |            | +42                            | +70       | +98       | +126 |
|                       |       | 1,5        | +14                            | +42       | +70       | +98  |
| 180                   | 360   | 1,5        | +45                            | +75       | +105      | +135 |
|                       |       |            | +15                            | +45       | +75       | +105 |
|                       |       | 1,75       | +48                            | +80       | +112      | +144 |
|                       |       |            | +16                            | +48       | +80       | +112 |
|                       |       | 2          | +51                            | +85       | +119      | +153 |
| 360                   | 720   | 2          | +17                            | +51       | +85       | +119 |
|                       |       |            | +54                            | +90       | +126      | +162 |
|                       |       | 2,5        | +18                            | +54       | +90       | +126 |
|                       |       |            | +40                            | +66       | +92       | +118 |
|                       |       | 1          | +13                            | +40       | +66       | +92  |
| 720                   | 1440  | 1,5        | +48                            | +80       | +112      | +144 |
|                       |       |            | +16                            | +48       | +80       | +112 |
|                       |       | 2          | +54                            | +90       | +126      | +162 |
|                       |       |            | +18                            | +54       | +90       | +126 |
|                       |       | 3          | +64                            | +106      | +148      | +190 |
| 1440                  | 2880  | 3          | +21                            | +64       | +106      | +148 |
|                       |       |            | +67                            | +112      | +157      | +202 |
|                       |       | 3,5        | +22                            | +67       | +112      | +157 |
|                       |       |            | +71                            | +118      | +165      | +212 |
|                       |       | 4          | +24                            | +71       | +118      | +165 |
| 2880                  | 5760  | 4          | +75                            | +125      | +175      | +225 |
|                       |       |            | +25                            | +75       | +125      | +175 |
|                       |       | 5          | +80                            | +133      | +186      | +239 |
|                       |       |            | +27                            | +80       | +133      | +186 |
|                       |       | 5,5        | +84                            | +140      | +196      | +252 |
| 5760                  | 11520 | 5,5        | +28                            | +84       | +140      | +196 |
|                       |       |            | +90                            | +150      | +210      | +270 |
|                       |       | 6          | +30                            | +90       | +150      | +210 |
|                       |       |            | +30                            | +90       | +150      | +210 |
|                       |       | 6          | +30                            | +90       | +150      | +210 |

(\*) According to EN 22857



## Icon description

### TAP AND DIE GEOMETRY



Hand tap



Tap with straight flutes



Tap with straight flutes and spiral point



Tap with straight flutes with interrupted thread



Tap with straight flutes and spiral point with interrupted thread



Tap with 15° right hand spiral



Tap with 15° left hand spiral



Tap with 40° right hand spiral and 2 flutes



Tap with 40° right hand spiral



Tap with 40° right hand spiral  
Left hand cut



Tap with 45° right hand spiral



Forming tap without oil grooves



Forming tap with oil grooves



Through coolant tap with internal axial hole,  
for blind holes



Through coolant tap with internal axial and radial  
holes, for through holes



Through coolant tap with internal axial hole,  
for blind holes



Through coolant forming tap with internal axial  
hole, for blind holes



Through coolant forming tap with internal axial and  
radial holes, for through holes



Thread Mills with internal axial coolant



Thread Mills with internal radial coolant



Die



Back tapering



Tap with through shank



Tap with long shank

### HOLE TYPE AND DEPTH



Through



Through, up to  $1 \times d_1$



Through, up to  $1,5 \times d_1$



Through, up to  $2,5 \times d_1$



Through, up to  $3 \times d_1$



Blind



Blind, up to  $1,5 \times d_1$



Blind, up to  $2 \times d_1$



Blind, up to  $2,5 \times d_1$



Blind, up to  $3 \times d_1$



Blind and through



Blind and through, up to  $1,5 \times d_1$



Blind and through, up to  $2 \times d_1$



Blind and through, up to  $2,5 \times d_1$



Blind and through, up to  $3 \times d_1$



Tapered hole



## Icon description



Nut

### DIRECTION OF CUT



Right hand cut



Left hand cut

### TYPE OF CHIP



Short chipping



Medium chipping



Medium to long chipping



Long chipping



Plastic deformation without chip formation

### COLOURED RING



Red ring - Hand taps A100 series

### TAP AND DIE TOLERANCE



Tolerance 4H / ISO1



Tolerance 6H / ISO2



Tolerance 6G / ISO3



Tolerance 7G



Tolerance 6HX



Tolerance 6GX



Tolerance 7GX



Tolerance 6H + 0,1 mm



Modified 6H Tolerance



Tolerance 3B



Tolerance 2B



Tolerance 2BX



Tolerance ISO 5969



Tolerance ISO 5969X



Medium Tolerance



Tolerance ISO 6g



Tolerance 2A



Tolerance Class A

### MATERIAL



Material: solid carbide



Material: conventional high speed steel



Material: conventional high speed steel



Material: powder metallurgy high speed steel



Material: high performance powder metallurgy high speed steel



Material: high performance powder metallurgy high speed steel

### THREAD TYPE



ISO Metric coarse thread



ISO Metric fine thread



Unified coarse thread  
UNC ASME - B1.1



## Icon description

|                      |                                                                    |
|----------------------|--------------------------------------------------------------------|
| <b>UNF</b>           | Unified fine thread - UNF ASME B1.1                                |
| <b>8-UN</b>          | 8-UN thread - ASME B1.1                                            |
| <b>G</b>             | Whitworth pipe thread - EN ISO 228                                 |
| <b>Rp<br/>(BSPP)</b> | Rp thread (BSPP) - DIN EN 10226-1                                  |
| <b>Rc<br/>(BSPT)</b> | Conical gas thread Rc (BSPT) taper 1:16 - BS 21 and DIN EN 10226-2 |
| <b>BSW</b>           | Whitworth thread - BS 84                                           |
| <b>NPT</b>           | National pipe thread, taper 1:16 - ASME/ANSI B1.20.1               |
| <b>NPTF</b>          | Dryseal National pipe thread, taper 1:16 - ASME/ANSI B1.20.3       |
| <b>EG-M</b>          | ISO Metric coarse thread - DIN 8140-2                              |
| <b>ISO</b>           | ISO thread DIN 13                                                  |
| <b>UN</b>            | American Unified Thread ASME B1.1                                  |
| <b>GAS</b>           | GAS thread EN ISO 228                                              |

### CHAMFER FORM

|                  |                                                           |
|------------------|-----------------------------------------------------------|
| <b>A (5-6)</b>   | Chamfer form A: 5 - 6 threads for through holes           |
| <b>B (4-5)</b>   | Chamfer form B: 4 - 5 threads for through holes           |
| <b>C (2-3)</b>   | Chamfer form C: 2 - 3 threads for blind and through holes |
| <b>D (4-5)</b>   | Chamfer form D: 4 - 5 threads for through holes           |
| <b>E (1,5-2)</b> | Chamfer form E: 1,5 - 2 threads for blind holes           |
| <b>1,75xP</b>    | Die chamfer form: 1,75 x P                                |

### APPLICATION INFORMATION

|  |                                                     |
|--|-----------------------------------------------------|
|  | Tap only for rigid tapping attachment (synchronous) |
|  | High recommended cutting speed                      |
|  | High tool life                                      |

### THREAD MILLS

|            |                      |
|------------|----------------------|
| <b>INT</b> | For internal threads |
| <b>EXT</b> | For external threads |







Graphic design by:  
**StudioAlmayern**  
Chieri - Torino - Italy

Printed by:  
**IlTipografo**  
Riva presso Chieri - Torino - Italy  
Printed 08/2025

Printed on 100% recycled FSC®  
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# Tool code list

| A SERIES     |           |      |
|--------------|-----------|------|
| TOOL CODE    | Thread    | Page |
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