

# GUHRING



## Aerospace

Tooling for Composites  
and Aerospace Materials

GUHRING – YOUR WORLDWIDE PARTNER

# TOOLS

FOR THE MACHINING OF MODERN  
COMPOSITE MATERIALS



» **FR100 CFRP  
END MILLS**  
see pages 6–7

Solid carbide



» **CR100 ROUTERS**  
see pages 8–13

Solid carbide



## PCD END MILLS

see pages 14–19



PCD



## CFRP DIAMOND DRILLS

see page 20



Solid carbide

## AERO X DRILLS

see page 21



Solid carbide

## TAPS

see pages 25–36



HSS-E-PM

## THREAD MILLING CUTTERS

see pages 37–38



Solid carbide



# MACHINING MODERN COMPOSITE MATERIALS

Modern fiber reinforced plastics (FRP's) are being used in an increasing number of industrial applications for reasons of efficiency, weight reduction, strength and dynamics. With their unique properties, they have the ability to enhance more traditional light weight construction materials such as aluminum and titanium. FRP's or multi-material combinations, ie. a mixture of FRP and metallic materials, are therefore no longer exclusively retained for the aerospace industry, motorsport and other high-end applications. It is especially worth highlighting the great growth in the general automotive and commercial vehicle technology.

FRP's are used in applications where high specific strength and low weight are essential. To machine FRP's and stacks (FRP-metal-layer composite) without component damage, cutting edge quality and wear resistance are of absolute importance. Guhring provides special solid carbide, coated carbide and PCD tooling solutions for these demanding materials. They are specially adapted to the respective material structure and ensure optimum chip evacuation as well as uniform hole diameters across all materials.

## CHALLENGES WITH MACHINING FRP'S

- fraying or splitting of fibers
- delamination
- no component damage through "peel-up" or "push-out"
- burr development
- thermal damage

# FR 100

high-performance milling cutters for the machining of automotive CFRP and GFRP components

Economical machining of modern fiber reinforced plastic composites such as carbon fiber and glass fiber reinforced plastics (CFRP/GFRP) requires high performance tooling, especially in a high production environment. In these types of material, the foremost goal is to prevent delamination and thermal damage. The special geometry of the FR 100 milling cutter enables reliable cutting of these materials without delamination or overheating even in complex multilayer structures – regardless of fiber orientation.

+ optimal MACHINING QUALITY

+ MINIMIZATION of manual re-working

+ high PRODUCTIVITY

+ long TOOL LIFE



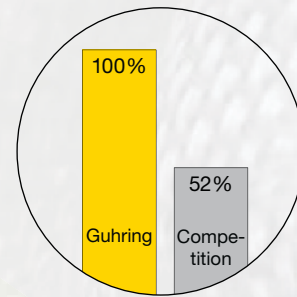
## Compression cut

The new geometry of the FR 100 enables a process reliable fiber cutting in 3D fiber structures. The shearing action prevents delamination, fiber fraying and thermal damage.



## Coating quality

Machining results in CFRP, GFRP and aramid show maximum edge quality. This reduces the manual reworking and simplifies the finish machining of FRC components in production.



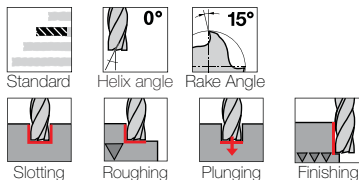
## Economic efficiency

In direct comparison to our competition tools FR 100 achieves up to double the tool life with considerably better part quality.

## FR 100 Compression Routers

Series

6769



Tool material

solid carbide

Coating

Diamond coated

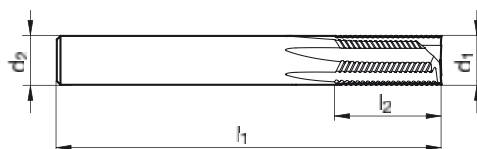
Shank



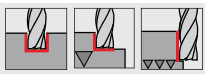
| Material |                 | Suitability |
|----------|-----------------|-------------|
| <b>P</b> | Steel           |             |
| <b>M</b> | Stainless steel |             |
| <b>K</b> | Cast iron       |             |
| <b>N</b> | Aluminum        |             |
| <b>S</b> | Ni / Ti alloys  |             |
| <b>H</b> | Hardened steel  |             |
|          | CFRP            | ●           |

●=Optimal ○=Secondary

Ultra-fine grain carbide, diamond coated, center cutting



| d1 (e10) | d1 (e10) | d2 (h6) | d2 (h6) | l1    | l1    | l2    | l2    | No. of Flutes | Code no. | EDP Number    |
|----------|----------|---------|---------|-------|-------|-------|-------|---------------|----------|---------------|
| mm       | inch     | mm      | inch    | mm    | inch  | mm    | inch  |               |          |               |
| 4.00     |          | 6.00    |         | 66.00 |       | 15.00 |       | 4             | 4.000    | 9067690040000 |
|          | 3/16     |         | 3/16    |       | 2 1/2 |       | 5/8   | 4             | 4.763    | 9067690047630 |
| 6.00     |          | 6.00    |         | 70.00 |       | 20.00 |       | 4             | 6.000    | 9067690060000 |
|          | 1/4      |         | 1/4     |       | 2 1/2 |       | 3/4   | 4             | 6.351    | 9067690063510 |
| 8.00     |          | 8.00    |         | 75.00 |       | 25.00 |       | 6             | 8.000    | 9067690080000 |
|          | 3/8      |         | 3/8     |       | 3     |       | 1     | 6             | 9.526    | 9067690095260 |
| 10.00    |          | 10.00   |         | 72.00 |       | 15.00 |       | 6             | 10.000   | 9067690100000 |
| 12.00    |          | 12.00   |         | 83.00 |       | 20.00 |       | 6             | 12.000   | 9067690120000 |
|          | 1/2      |         | 1/2     |       | 3 1/2 |       | 1 1/4 | 8             | 12.701   | 9067690127010 |

| Material | Process                                                                             | Cutting speed | Feed rate         |
|----------|-------------------------------------------------------------------------------------|---------------|-------------------|
| CFRP     |  | 500 - 1500SFM | 0.0005 - 0.002IPT |
| CFRP     |  | 400 - 500SFM  | 0.002 - 0.008IPR  |



## FR 100 Compression Routers

Series

6770

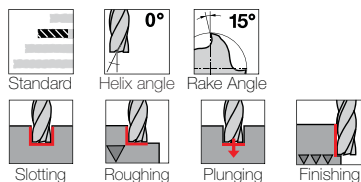
Tool material

solid carbide

Coating

Diamond coated

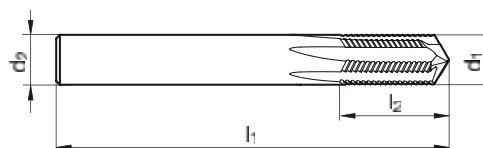
Shank



| Material |                 | Suitability |
|----------|-----------------|-------------|
| <b>P</b> | Steel           |             |
| <b>M</b> | Stainless steel |             |
| <b>K</b> | Cast iron       |             |
| <b>N</b> | Aluminum        |             |
| <b>S</b> | Ni / Ti alloys  |             |
| <b>H</b> | Hardened steel  |             |
|          | CFRP            | ●           |

●=Optimal    ○=Secondary

Ultra-fine grain carbide, diamond coated, with drill point



| d1 (e10) | d1 (e10) | d2 (h6) | d2 (h6) | l1    | l1    | l2    | l2    | No. of Flutes | Code no. | EDP Number    |
|----------|----------|---------|---------|-------|-------|-------|-------|---------------|----------|---------------|
| mm       | inch     | mm      | inch    | mm    | inch  | mm    | inch  |               |          |               |
| 4.00     |          | 6.00    |         | 66.00 |       | 15.00 |       | 4             | 4.000    | 9067700040000 |
|          | 3/16     |         | 3/16    |       | 2 1/2 |       | 5/8   | 4             | 4.763    | 9067700047630 |
| 6.00     |          | 6.00    |         | 70.00 |       | 20.00 |       | 4             | 6.000    | 9067700060000 |
|          | 1/4      |         | 1/4     |       | 2 1/2 |       | 3/4   | 4             | 6.351    | 9067700063510 |
| 8.00     |          | 8.00    |         | 75.00 |       | 25.00 |       | 6             | 8.000    | 9067700080000 |
|          | 3/8      |         | 3/8     |       | 3     |       | 1     | 6             | 9.526    | 9067700095260 |
| 10.00    |          | 10.00   |         | 72.00 |       | 15.00 |       | 6             | 10.000   | 9067700100000 |
| 12.00    |          | 12.00   |         | 83.00 |       | 20.00 |       | 6             | 12.000   | 9067700120000 |
|          | 1/2      |         | 1/2     |       | 3 1/2 |       | 1 1/4 | 8             | 12.701   | 9067700127010 |
|          |          |         |         |       |       |       |       |               |          |               |
|          |          |         |         |       |       |       |       |               |          |               |
|          |          |         |         |       |       |       |       |               |          |               |
|          |          |         |         |       |       |       |       |               |          |               |
|          |          |         |         |       |       |       |       |               |          |               |
|          |          |         |         |       |       |       |       |               |          |               |

| Material | Process | Cutting speed | Feed rate         |
|----------|---------|---------------|-------------------|
| CFRP     |         | 500 - 1500SFM | 0.0005 - 0.002IPT |
| CFRP     |         | 400 - 500SFM  | 0.002 - 0.007IPR  |



## CR 100 Straight Flute Routers

Series

Tool material

Solid Carbide

Coating

Diamond coated

Shank



Standard



Helix angle



Chamfer



Rake Angle



Slotting



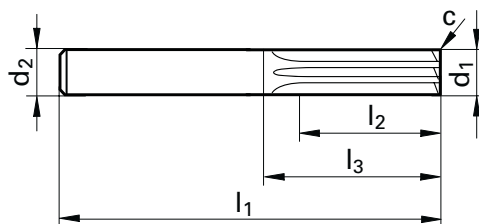
Roughing



Finishing

| Material                 |                 | Suitability |
|--------------------------|-----------------|-------------|
| <b>P</b>                 | Steel           |             |
| <b>M</b>                 | Stainless steel |             |
| <b>K</b>                 | Cast iron       |             |
| <b>N</b>                 | Aluminum        |             |
| <b>S</b>                 | Ni / Ti alloys  |             |
| <b>H</b>                 | Hardened steel  |             |
|                          | CFRP            | ●           |
| ●=Optimal    ○=Secondary |                 |             |

Ultra-fine grain carbide, diamond coated, non-center cutting



| d1 e10 | d2 h6 | l1    | l2    | l3   | c          | No. of Flutes | Order Number |
|--------|-------|-------|-------|------|------------|---------------|--------------|
| inch   | inch  | inch  | inch  | inch | inch x 45° |               |              |
| 1/4    | 1/4   | 2 1/2 | 3/4   | 1.32 | 0.15       | 10            | 302284000    |
| 3/8    | 3/8   | 3     | 1     | 1.58 | 0.15       | 14            | 302284001    |
| 1/2    | 1/2   | 3 1/2 | 1 1/4 | 1.93 | 0.15       | 15            | 302284002    |
| 5/8    | 5/8   | 4     | 1 5/8 | 2.43 | 0.15       | 15            | 302284003    |
|        |       |       |       |      |            |               |              |
|        |       |       |       |      |            |               |              |
|        |       |       |       |      |            |               |              |
|        |       |       |       |      |            |               |              |
|        |       |       |       |      |            |               |              |
|        |       |       |       |      |            |               |              |
|        |       |       |       |      |            |               |              |
|        |       |       |       |      |            |               |              |
|        |       |       |       |      |            |               |              |

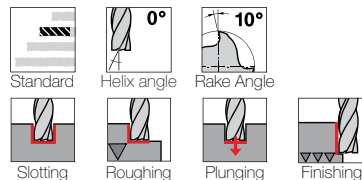
| Material | Process | Cutting speed | Feed rate          |
|----------|---------|---------------|--------------------|
| CFRP     |         | 500 - 800SFM  | 0.0003 - 0.0004IPT |





## CR 100 Straight Flute Routers

Series



Tool material

Solid Carbide

Coating

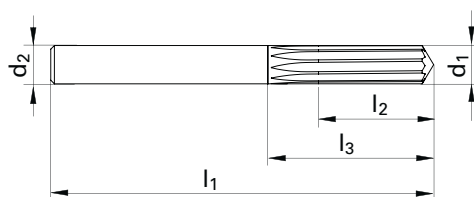
Diamond coated

Shank



| Material              | Suitability     |   |
|-----------------------|-----------------|---|
| <b>P</b>              | Steel           |   |
| <b>M</b>              | Stainless steel |   |
| <b>K</b>              | Cast iron       |   |
| <b>N</b>              | Aluminum        |   |
| <b>S</b>              | Ni / Ti alloys  |   |
| <b>H</b>              | Hardened steel  |   |
|                       | CFRP            | ● |
| ●=Optimal ○=Secondary |                 |   |

Ultra-fine grain carbide, diamond coated, with drill point



| d1 e10 | d2 h6 | l1    | l2    | l3   | No. of Flutes | Order Number |
|--------|-------|-------|-------|------|---------------|--------------|
| inch   | inch  | inch  | inch  | inch |               |              |
| 1/4    | 1/4   | 2-1/2 | 3/4   | 1.08 | 10            | 302284015    |
| 3/8    | 3/8   | 3     | 1     | 1.43 | 14            | 302284016    |
| 1/2    | 1/2   | 3-1/2 | 1-1/4 | 1.73 | 15            | 302284017    |
| 5/8    | 5/8   | 4     | 1-5/8 | 2.24 | 15            | 302284018    |
|        |       |       |       |      |               |              |
|        |       |       |       |      |               |              |
|        |       |       |       |      |               |              |
|        |       |       |       |      |               |              |
|        |       |       |       |      |               |              |
|        |       |       |       |      |               |              |
|        |       |       |       |      |               |              |
|        |       |       |       |      |               |              |
|        |       |       |       |      |               |              |

| Material | Process | Cutting speed | Feed rate          |
|----------|---------|---------------|--------------------|
| CFRP     |         | 500 - 800SFM  | 0.0003 - 0.0004IPT |
| CFRP     |         | 300 - 500SFM  | 0.002 - 0.007IPR   |



## CR 100 Straight Flute Routers

Series

6717



Standard



Helix angle



Chamfer



Rake Angle



Slotting



Roughing



Finishing

Tool material

Solid Carbide

Coating

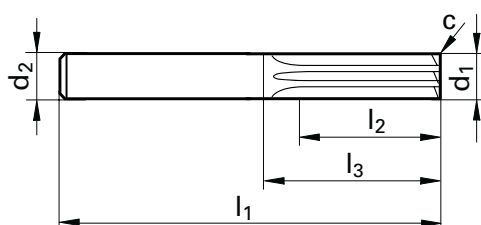
Diamond coated

Shank



| Material              |                 | Suitability |
|-----------------------|-----------------|-------------|
| <b>P</b>              | Steel           |             |
| <b>M</b>              | Stainless steel |             |
| <b>K</b>              | Cast iron       |             |
| <b>N</b>              | Aluminum        |             |
| <b>S</b>              | Ni / Ti alloys  |             |
| <b>H</b>              | Hardened steel  |             |
|                       | CFRP            | ●           |
| ●=Optimal ○=Secondary |                 |             |

Ultra-fine grain carbide, diamond coated, non-center cutting



| d1 e10 | d2 h6  | l1     | l2    | l3    | c        | No. of Flutes | Code no. | EDP Number    |
|--------|--------|--------|-------|-------|----------|---------------|----------|---------------|
| mm     | mm     | mm     | mm    | mm    | mm x 45° |               |          |               |
| 4.000  | 6.000  | 57.00  | 10.00 | 19.40 | 0.10     | 6             | 4.000    | 9067170040000 |
| 6.000  | 6.000  | 65.00  | 15.00 | 29.00 | 0.15     | 8             | 6.000    | 9067170060000 |
| 8.000  | 8.000  | 75.00  | 20.00 | 39.00 | 0.15     | 10            | 8.000    | 9067170080000 |
| 10.000 | 10.000 | 80.00  | 25.00 | 40.00 | 0.15     | 12            | 10.000   | 9067170100000 |
| 12.000 | 12.000 | 93.00  | 32.00 | 48.00 | 0.15     | 14            | 12.000   | 9067170120000 |
| 16.000 | 16.000 | 108.00 | 34.00 | 60.00 | 0.15     | 14            | 16.000   | 9067170160000 |

| Material | Process | Cutting speed | Feed rate          |
|----------|---------|---------------|--------------------|
| CFRP     |         | 500 - 800SFM  | 0.0003 - 0.0004IPT |



## CR 100 Straight Flute Routers

Series

6719



Standard



Helix angle



Chamfer



Flute Angle



Slotting



Roughing



Ramping



Helix



Plunging



Finishing

Tool material

Solid Carbide

Coating

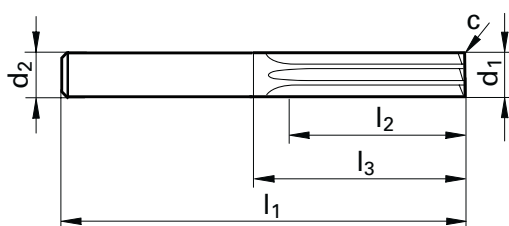
Diamond coated

Shank



| Material              |                 | Suitability |
|-----------------------|-----------------|-------------|
| <b>P</b>              | Steel           |             |
| <b>M</b>              | Stainless steel |             |
| <b>K</b>              | Cast iron       |             |
| <b>N</b>              | Aluminum        |             |
| <b>S</b>              | Ni / Ti alloys  |             |
| <b>H</b>              | Hardened steel  |             |
|                       | CFRP            | ●           |
| ●=Optimal ○=Secondary |                 |             |

Ultra-fine grain carbide, diamond coated, center cutting



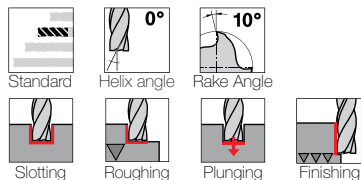
| d1 e10 | d2 h6  | l1     | l2    | l3    | c        | No. of Flutes | Code no. | EDP Number    |
|--------|--------|--------|-------|-------|----------|---------------|----------|---------------|
| mm     | mm     | mm     | mm    | mm    | mm x 45° |               |          |               |
| 4.000  | 6.000  | 57.00  | 10.00 | 19.40 | 0.10     | 6             | 4.000    | 9067190040000 |
| 6.000  | 6.000  | 65.00  | 15.00 | 29.00 | 0.15     | 8             | 6.000    | 9067190060000 |
| 8.000  | 8.000  | 75.00  | 20.00 | 39.00 | 0.15     | 10            | 8.000    | 9067190080000 |
| 10.000 | 10.000 | 80.00  | 25.00 | 40.00 | 0.15     | 12            | 10.000   | 9067190100000 |
| 12.000 | 12.000 | 93.00  | 32.00 | 48.00 | 0.15     | 14            | 12.000   | 9067190120000 |
| 16.000 | 16.000 | 108.00 | 34.00 | 60.00 | 0.15     | 14            | 16.000   | 9067190160000 |

| Material | Process | Cutting speed | Feed rate          |
|----------|---------|---------------|--------------------|
| CFRP     |         | 500 - 800SFM  | 0.0003 - 0.0004IPT |
| CFRP     |         | 300 - 500SFM  | 0.002 - 0.007IPR   |

## CR 100 Straight Flute Routers

Series

6720



Tool material

Solid Carbide

Coating

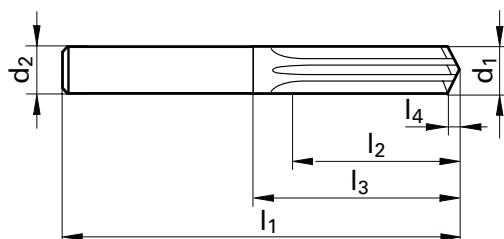
Diamond coated

Shank

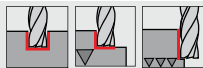


| Material              |                 | Suitability |
|-----------------------|-----------------|-------------|
| <b>P</b>              | Steel           |             |
| <b>M</b>              | Stainless steel |             |
| <b>K</b>              | Cast iron       |             |
| <b>N</b>              | Aluminum        |             |
| <b>S</b>              | Ni / Ti alloys  |             |
| <b>H</b>              | Hardened steel  |             |
|                       | CFRP            | ●           |
| ●=Optimal ○=Secondary |                 |             |

Ultra-fine grain carbide, diamond coated, with drill point



| d1 e10 | d2 h6  | l1     | l2    | l3    | l4   | No. of Flutes | Code no. | EDP Number    |
|--------|--------|--------|-------|-------|------|---------------|----------|---------------|
| mm     | mm     | mm     | mm    | mm    | mm   |               |          |               |
| 4.000  | 4.000  | 55.00  | 12.00 | 27.00 | 1.30 | 6             | 4.000    | 9067200040000 |
| 6.000  | 6.000  | 65.00  | 18.00 | 29.00 | 1.90 | 8             | 6.000    | 9067200060000 |
| 8.000  | 8.000  | 75.00  | 24.00 | 39.00 | 2.50 | 10            | 8.000    | 9067200080000 |
| 10.000 | 10.000 | 80.00  | 30.00 | 40.00 | 3.10 | 12            | 10.000   | 9067200100000 |
| 12.000 | 12.000 | 93.00  | 36.00 | 48.00 | 3.70 | 14            | 12.000   | 9067200120000 |
| 16.000 | 16.000 | 108.00 | 48.00 | 60.00 | 4.90 | 14            | 16.000   | 9067200160000 |
|        |        |        |       |       |      |               |          |               |
|        |        |        |       |       |      |               |          |               |
|        |        |        |       |       |      |               |          |               |
|        |        |        |       |       |      |               |          |               |
|        |        |        |       |       |      |               |          |               |
|        |        |        |       |       |      |               |          |               |
|        |        |        |       |       |      |               |          |               |

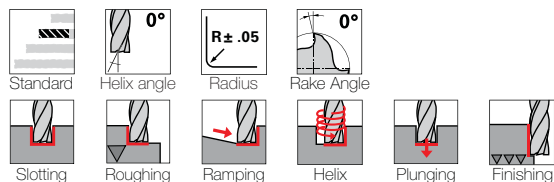
| Material | Process                                                                             | Cutting speed | Feed rate          |
|----------|-------------------------------------------------------------------------------------|---------------|--------------------|
| CFRP     |  | 500 - 800SFM  | 0.0003 - 0.0004IPT |
| CFRP     |  | 300 - 500SFM  | 0.002 - 0.007IPR   |



## PCD End Mills (2-flute) - Inch - Standard Length

Series

3867



Tool material

PCD

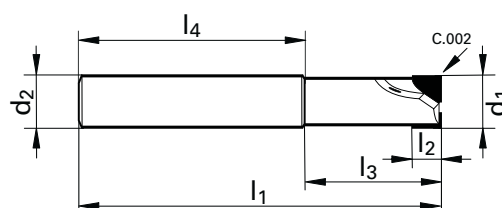
Coating

Uncoated

Shank



| Material              |                 | Suitability |
|-----------------------|-----------------|-------------|
| <b>P</b>              | Steel           |             |
| <b>M</b>              | Stainless steel |             |
| <b>K</b>              | Cast iron       |             |
| <b>N</b>              | Aluminum        | ●           |
| <b>S</b>              | Ni / Ti alloys  |             |
| <b>H</b>              | Hardened steel  |             |
|                       | CFRP            | ●           |
| ●=Optimal ○=Secondary |                 |             |



| d1 e10 | d2 h6 | l1    | l2   | l3     | No. of Flutes | Code no. | EDP Number    |
|--------|-------|-------|------|--------|---------------|----------|---------------|
| inch   | inch  | inch  | inch | inch   |               |          |               |
| 1/4    | 1/4   | 2 1/2 | 3/4  | 1 1/16 | 2             | 6.350    | 9038670063500 |
| 3/8    | 3/8   | 3     | 3/4  | 1 1/4  | 2             | 9.520    | 9038670095200 |
| 1/2    | 1/2   | 3     | 1    | 1 5/16 | 2             | 12.700   | 9038670127000 |
| 3/4    | 3/4   | 4     | 1    | 1 5/8  | 2             | 19.050   | 9038670190500 |
|        |       |       |      |        |               |          |               |
|        |       |       |      |        |               |          |               |
|        |       |       |      |        |               |          |               |
|        |       |       |      |        |               |          |               |
|        |       |       |      |        |               |          |               |
|        |       |       |      |        |               |          |               |
|        |       |       |      |        |               |          |               |
|        |       |       |      |        |               |          |               |

| Material       | Characteristic            | Cutting Speed<br>SFM | Feed Rate (IPT) with nom. Ø |        |        |        |        |
|----------------|---------------------------|----------------------|-----------------------------|--------|--------|--------|--------|
|                |                           |                      | 1/4                         | 3/8    | 1/2    | 3/4    | 1      |
| N<br>Aluminium | less than 7% Si           | 1970                 | 0.0015                      | 0.0023 | 0.0029 | 0.0038 | 0.0040 |
|                | Up to 17% Si              | 850                  | 0.0013                      | 0.0019 | 0.0025 | 0.0034 | 0.0036 |
| Graphite       | up to 8 micron grain size | 1475                 | 0.0025                      | 0.0038 | 0.0050 | 0.0068 | 0.0072 |
| CFRP           | over 50% fiber content    | 980                  | 0.0013                      | 0.0019 | 0.0025 | 0.0034 | 0.0036 |



## PCD End Mills (3-flute) - Inch - Standard Length

Series

3870



Standard



Helix angle



Radius



Rake Angle



Slotting



Roughing



Finishing

Tool material

PCD

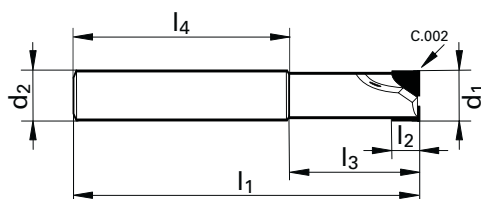
Coating

Uncoated

Shank



| Material              |                 | Suitability |
|-----------------------|-----------------|-------------|
| <b>P</b>              | Steel           |             |
| <b>M</b>              | Stainless steel |             |
| <b>K</b>              | Cast iron       |             |
| <b>N</b>              | Aluminum        | ●           |
| <b>S</b>              | Ni / Ti alloys  |             |
| <b>H</b>              | Hardened steel  |             |
|                       | CFRP            | ●           |
| ●=Optimal ○=Secondary |                 |             |



| d1 e10 | d2 h6 | l1   | l2   | l3     | No. of Flutes | Code no. | EDP Number    |
|--------|-------|------|------|--------|---------------|----------|---------------|
| inch   | inch  | inch | inch | inch   |               |          |               |
| 1/2    | 1/2   | 3    | 1/2  | 1 5/16 | 3             | 12.700   | 9038700127000 |
| 3/4    | 3/4   | 3    | 1/2  | 1      | 3             | 19.050   | 9038700190500 |
| 1      | 1     | 4    | 1    | 1 5/8  | 3             | 25.400   | 9038700254000 |
|        |       |      |      |        |               |          |               |
|        |       |      |      |        |               |          |               |
|        |       |      |      |        |               |          |               |
|        |       |      |      |        |               |          |               |
|        |       |      |      |        |               |          |               |
|        |       |      |      |        |               |          |               |
|        |       |      |      |        |               |          |               |
|        |       |      |      |        |               |          |               |
|        |       |      |      |        |               |          |               |

| Material       | Characteristic            | Cutting Speed<br>SFM | Feed Rate (IPT) with nom. Ø |        |        |        |        |
|----------------|---------------------------|----------------------|-----------------------------|--------|--------|--------|--------|
|                |                           |                      | 1/4                         | 3/8    | 1/2    | 3/4    | 1      |
| N<br>Aluminium | less than 7% Si           | 1970                 | 0.0015                      | 0.0023 | 0.0029 | 0.0038 | 0.0040 |
|                | Up to 17% Si              | 850                  | 0.0013                      | 0.0019 | 0.0025 | 0.0034 | 0.0036 |
| Graphite       | up to 8 micron grain size | 1475                 | 0.0025                      | 0.0038 | 0.0050 | 0.0068 | 0.0072 |
| CFRP           | over 50% fiber content    | 980                  | 0.0013                      | 0.0019 | 0.0025 | 0.0034 | 0.0036 |



## PCD End Mills (2-flute) - Metric - Standard Length - Coolant Fed

Series

5492



Standard



Helix angle



Radius



Rake Angle



Slotting



Roughing



Ramping



Helix



Plunging



Finishing



Copy Milling

Tool material

PCD

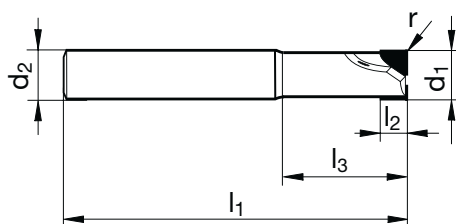
Coating

Uncoated

Shank



| Material              |                 | Suitability |
|-----------------------|-----------------|-------------|
| <b>P</b>              | Steel           |             |
| <b>M</b>              | Stainless steel |             |
| <b>K</b>              | Cast iron       |             |
| <b>N</b>              | Aluminum        | ●           |
| <b>S</b>              | Ni / Ti alloys  |             |
| <b>H</b>              | Hardened steel  |             |
|                       | CFRP            | ●           |
| ●=Optimal ○=Secondary |                 |             |



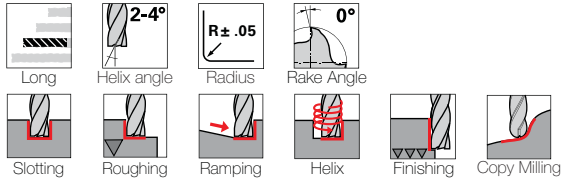
| d1 (± 0.02) | d2 h6  | l1     | l2    | l3    | r    | No. of Flutes | Code no. | EDP Number    |
|-------------|--------|--------|-------|-------|------|---------------|----------|---------------|
| mm          | mm     | mm     | mm    | mm    | mm   |               |          |               |
| 4.000       | 6.000  | 51.00  | 6.00  | 6.40  | 0.10 | 2             | 4.000    | 9054920040000 |
| 5.000       | 6.000  | 51.00  | 8.00  | 8.40  | 0.10 | 2             | 5.000    | 9054920050000 |
| 6.000       | 6.000  | 57.00  | 8.00  | 21.00 | 0.10 | 2             | 6.000    | 9054920060000 |
| 8.000       | 8.000  | 63.00  | 8.00  | 27.00 | 0.10 | 2             | 8.000    | 9054920080000 |
| 8.000       | 8.000  | 63.00  | 12.00 | 27.00 | 0.10 | 2             | 8.001    | 9054920080010 |
| 10.000      | 10.000 | 72.00  | 8.00  | 32.00 | 0.10 | 2             | 10.000   | 9054920100000 |
| 10.000      | 10.000 | 72.00  | 16.00 | 32.00 | 0.10 | 2             | 10.001   | 9054920100010 |
| 12.000      | 12.000 | 83.00  | 8.00  | 38.00 | 0.10 | 2             | 12.000   | 9054920120000 |
| 12.000      | 12.000 | 83.00  | 16.00 | 38.00 | 0.10 | 2             | 12.001   | 9054920120010 |
| 14.000      | 14.000 | 83.00  | 8.00  | 38.00 | 0.10 | 2             | 14.000   | 9054920140000 |
| 14.000      | 14.000 | 83.00  | 16.00 | 38.00 | 0.10 | 2             | 14.001   | 9054920140010 |
| 16.000      | 16.000 | 100.00 | 12.00 | 52.00 | 0.10 | 2             | 16.000   | 9054920160000 |
| 16.000      | 16.000 | 100.00 | 20.00 | 52.00 | 0.10 | 2             | 16.001   | 9054920160010 |
| 18.000      | 18.000 | 100.00 | 12.00 | 52.00 | 0.10 | 2             | 18.000   | 9054920180000 |
| 18.000      | 18.000 | 100.00 | 20.00 | 52.00 | 0.10 | 2             | 18.001   | 9054920180010 |
| 20.000      | 20.000 | 100.00 | 12.00 | 50.00 | 0.10 | 2             | 20.000   | 9054920200000 |
| 20.000      | 20.000 | 100.00 | 20.00 | 50.00 | 0.10 | 2             | 20.001   | 9054920200010 |

| Material       | Characteristic         | Cutting speed<br>SFM | Feed Rate (IPT) with nom. Ø |        |        |        |        |        |        |
|----------------|------------------------|----------------------|-----------------------------|--------|--------|--------|--------|--------|--------|
|                |                        |                      | 4                           | 6      | 8      | 10     | 12     | 16     | 20     |
| N<br>Aluminium | up to 7% Si            | 1970                 | 0.0010                      | 0.0014 | 0.0018 | 0.0024 | 0.0028 | 0.0035 | 0.0039 |
|                | up to 17% Si           | 850                  | 0.0008                      | 0.0012 | 0.0016 | 0.0020 | 0.0024 | 0.0028 | 0.0035 |
| Graphite       | up to 8 µm grain size  | 1475                 | 0.0016                      | 0.0024 | 0.0031 | 0.0039 | 0.0047 | 0.0059 | 0.0071 |
| CFRP           | over 50% fiber content | 980                  | 0.0008                      | 0.0012 | 0.0016 | 0.0020 | 0.0024 | 0.0028 | 0.0035 |

## PCD End Mills (2-flute) - Metric - Long Length - Coolant Fed

Series

5493



Tool material

PCD

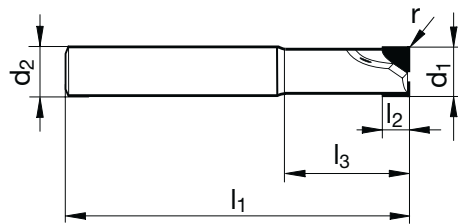
Coating

Uncoated

Shank



| Material              |                 | Suitability |
|-----------------------|-----------------|-------------|
| <b>P</b>              | Steel           |             |
| <b>M</b>              | Stainless steel |             |
| <b>K</b>              | Cast iron       |             |
| <b>N</b>              | Aluminum        | ●           |
| <b>S</b>              | Ni / Ti alloys  |             |
| <b>H</b>              | Hardened steel  |             |
|                       | CFRP            | ●           |
| ●=Optimal ○=Secondary |                 |             |



| d1 (± 0.02) | d2 h6  | l1     | l2    | l3    | r    | No. of Flutes | Code no. | EDP Number    |
|-------------|--------|--------|-------|-------|------|---------------|----------|---------------|
| mm          | mm     | mm     | mm    | mm    | mm   |               |          |               |
| 4.000       | 6.000  | 70.00  | 6.00  | 6.40  | 0.10 | 2             | 4.000    | 9054930040000 |
| 5.000       | 6.000  | 70.00  | 8.00  | 8.40  | 0.10 | 2             | 5.000    | 9054930050000 |
| 6.000       | 6.000  | 75.00  | 8.00  | 21.00 | 0.10 | 2             | 6.000    | 9054930060000 |
| 8.000       | 8.000  | 100.00 | 8.00  | 27.00 | 0.10 | 2             | 8.000    | 9054930080000 |
| 8.000       | 8.000  | 100.00 | 12.00 | 27.00 | 0.10 | 2             | 8.001    | 9054930080010 |
| 10.000      | 10.000 | 100.00 | 8.00  | 32.00 | 0.10 | 2             | 10.000   | 9054930100000 |
| 10.000      | 10.000 | 100.00 | 16.00 | 32.00 | 0.10 | 2             | 10.001   | 9054930100010 |
| 12.000      | 12.000 | 100.00 | 8.00  | 38.00 | 0.10 | 2             | 12.000   | 9054930120000 |
| 12.000      | 12.000 | 100.00 | 16.00 | 38.00 | 0.10 | 2             | 12.001   | 9054930120010 |
| 14.000      | 14.000 | 100.00 | 8.00  | 38.00 | 0.10 | 2             | 14.000   | 9054930140000 |
| 14.000      | 14.000 | 100.00 | 16.00 | 38.00 | 0.10 | 2             | 14.001   | 9054930140010 |
| 16.000      | 16.000 | 150.00 | 12.00 | 52.00 | 0.10 | 2             | 16.000   | 9054930160000 |
| 16.000      | 16.000 | 150.00 | 20.00 | 52.00 | 0.10 | 2             | 16.001   | 9054930160010 |
| 18.000      | 18.000 | 125.00 | 12.00 | 52.00 | 0.10 | 2             | 18.000   | 9054930180000 |
| 18.000      | 18.000 | 125.00 | 20.00 | 52.00 | 0.10 | 2             | 18.001   | 9054930180010 |
| 18.000      | 18.000 | 150.00 | 20.00 | 52.00 | 0.10 | 2             | 18.002   | 9054930180020 |
| 18.000      | 18.000 | 150.00 | 12.00 | 52.00 | 0.10 | 2             | 18.003   | 9054930180030 |
| 20.000      | 20.000 | 150.00 | 12.00 | 50.00 | 0.10 | 2             | 20.000   | 9054930200000 |
| 20.000      | 20.000 | 150.00 | 20.00 | 50.00 | 0.10 | 2             | 20.001   | 9054930200010 |

| Material       | Characteristic         | Cutting speed<br>SFM | Feed Rate (IPT) with nom. Ø |        |        |        |        |        |        |
|----------------|------------------------|----------------------|-----------------------------|--------|--------|--------|--------|--------|--------|
|                |                        |                      | 4                           | 6      | 8      | 10     | 12     | 16     | 20     |
| N<br>Aluminium | up to 7% Si            | 1970                 | 0.0010                      | 0.0014 | 0.0018 | 0.0024 | 0.0028 | 0.0035 | 0.0039 |
|                | up to 17% Si           | 850                  | 0.0008                      | 0.0012 | 0.0016 | 0.0020 | 0.0024 | 0.0028 | 0.0035 |
| Graphite       | up to 8 µm grain size  | 1475                 | 0.0016                      | 0.0024 | 0.0031 | 0.0039 | 0.0047 | 0.0059 | 0.0071 |
| CFRP           | over 50% fiber content | 980                  | 0.0008                      | 0.0012 | 0.0016 | 0.0020 | 0.0024 | 0.0028 | 0.0035 |



## PCD End Mills (3-flute) - Metric - Standard Length - Coolant Fed

Series

5495



Standard



Helix angle



Radius



Rake Angle



Slotting



Roughing



Ramping



Helix



Plunging



Finishing



Copy Milling

Tool material

PCD

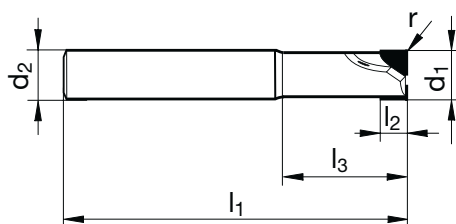
Coating

Uncoated

Shank



| Material              | Suitability     |   |
|-----------------------|-----------------|---|
| <b>P</b>              | Steel           |   |
| <b>M</b>              | Stainless steel |   |
| <b>K</b>              | Cast iron       |   |
| <b>N</b>              | Aluminum        | ● |
| <b>S</b>              | Ni / Ti alloys  |   |
| <b>H</b>              | Hardened steel  |   |
|                       | CFRP            | ● |
| ●=Optimal ○=Secondary |                 |   |



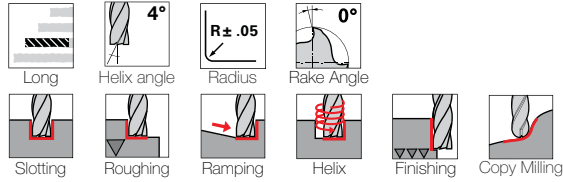
| d1 (± 0.02) | d2 h6  | l1     | l2    | l3    | r    | No. of Flutes | Code no. | EDP Number    |
|-------------|--------|--------|-------|-------|------|---------------|----------|---------------|
| mm          | mm     | mm     | mm    | mm    | mm   |               |          |               |
| 14.000      | 14.000 | 83.00  | 8.00  | 38.00 | 0.10 | 3             | 14.000   | 9054950140000 |
| 14.000      | 14.000 | 83.00  | 16.00 | 38.00 | 0.10 | 3             | 14.001   | 9054950140010 |
| 16.000      | 16.000 | 100.00 | 12.00 | 52.00 | 0.10 | 3             | 16.000   | 9054950160000 |
| 16.000      | 16.000 | 100.00 | 20.00 | 52.00 | 0.10 | 3             | 16.001   | 9054950160010 |
| 18.000      | 18.000 | 100.00 | 12.00 | 52.00 | 0.10 | 3             | 18.000   | 9054950180000 |
| 18.000      | 18.000 | 100.00 | 20.00 | 52.00 | 0.10 | 3             | 18.001   | 9054950180010 |
| 20.000      | 20.000 | 100.00 | 12.00 | 50.00 | 0.10 | 3             | 20.000   | 9054950200000 |
| 20.000      | 20.000 | 100.00 | 20.00 | 50.00 | 0.10 | 3             | 20.001   | 9054950200010 |
|             |        |        |       |       |      |               |          |               |
|             |        |        |       |       |      |               |          |               |
|             |        |        |       |       |      |               |          |               |
|             |        |        |       |       |      |               |          |               |
|             |        |        |       |       |      |               |          |               |
|             |        |        |       |       |      |               |          |               |

| Material       | Characteristic         | Cutting speed<br>SFM | Feed Rate (IPT) with nom. Ø |        |        |        |        |        |        |
|----------------|------------------------|----------------------|-----------------------------|--------|--------|--------|--------|--------|--------|
|                |                        |                      | 4                           | 6      | 8      | 10     | 12     | 16     | 20     |
| N<br>Aluminium | up to 7% Si            | 1970                 | 0.0010                      | 0.0014 | 0.0018 | 0.0024 | 0.0028 | 0.0035 | 0.0039 |
|                | up to 17% Si           | 850                  | 0.0008                      | 0.0012 | 0.0016 | 0.0020 | 0.0024 | 0.0028 | 0.0035 |
| Graphite       | up to 8 µm grain size  | 1475                 | 0.0016                      | 0.0024 | 0.0031 | 0.0039 | 0.0047 | 0.0059 | 0.0071 |
| CFRP           | over 50% fiber content | 980                  | 0.0008                      | 0.0012 | 0.0016 | 0.0020 | 0.0024 | 0.0028 | 0.0035 |

## PCD End Mills (3-flute) - Metric - Long Length - Coolant Fed

Series

5496



Tool material

PCD

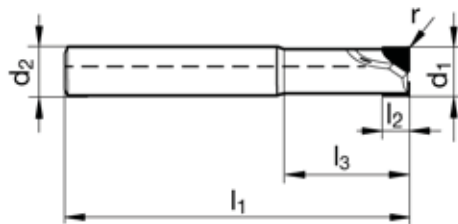
Coating

Uncoated

Shank



| Material              |                 | Suitability |
|-----------------------|-----------------|-------------|
| <b>P</b>              | Steel           |             |
| <b>M</b>              | Stainless steel |             |
| <b>K</b>              | Cast iron       |             |
| <b>N</b>              | Aluminum        | ●           |
| <b>S</b>              | Ni / Ti alloys  |             |
| <b>H</b>              | Hardened steel  |             |
|                       | CFRP            | ●           |
| ●=Optimal ○=Secondary |                 |             |



| d1 (± 0.02) | d2 h6  | l1     | l2    | l3    | r    | No. of Flutes | Code no. | EDP Number    |
|-------------|--------|--------|-------|-------|------|---------------|----------|---------------|
| mm          | mm     | mm     | mm    | mm    | mm   |               |          |               |
| 14.000      | 14.000 | 100.00 | 8.00  | 38.00 | 0.10 | 3             | 14.000   | 9054960140000 |
| 14.000      | 14.000 | 100.00 | 16.00 | 38.00 | 0.10 | 3             | 14.001   | 9054960140010 |
| 16.000      | 16.000 | 150.00 | 12.00 | 52.00 | 0.10 | 3             | 16.000   | 9054960160000 |
| 16.000      | 16.000 | 150.00 | 20.00 | 52.00 | 0.10 | 3             | 16.001   | 9054960160010 |
| 18.000      | 18.000 | 150.00 | 12.00 | 52.00 | 0.10 | 3             | 18.000   | 9054960180000 |
| 18.000      | 18.000 | 150.00 | 20.00 | 52.00 | 0.10 | 3             | 18.001   | 9054960180010 |
| 20.000      | 20.000 | 150.00 | 12.00 | 50.00 | 0.10 | 3             | 20.000   | 9054960200000 |
| 20.000      | 20.000 | 150.00 | 20.00 | 50.00 | 0.10 | 3             | 20.001   | 9054960200010 |

| Material    | Characteristic         | Cutting speed SFM | Feed Rate (IPT) with nom. Ø |        |        |        |        |        |        |
|-------------|------------------------|-------------------|-----------------------------|--------|--------|--------|--------|--------|--------|
|             |                        |                   | 4                           | 6      | 8      | 10     | 12     | 16     | 20     |
| N Aluminium | up to 7% Si            | 1970              | 0.0010                      | 0.0014 | 0.0018 | 0.0024 | 0.0028 | 0.0035 | 0.0039 |
|             | up to 17% Si           | 850               | 0.0008                      | 0.0012 | 0.0016 | 0.0020 | 0.0024 | 0.0028 | 0.0035 |
| Graphite    | up to 8 µm grain size  | 1475              | 0.0016                      | 0.0024 | 0.0031 | 0.0039 | 0.0047 | 0.0059 | 0.0071 |
| CFRP        | over 50% fiber content | 980               | 0.0008                      | 0.0012 | 0.0016 | 0.0020 | 0.0024 | 0.0028 | 0.0035 |



## Diamond Coated Carbide Drills



Tool material

Solid Carbide

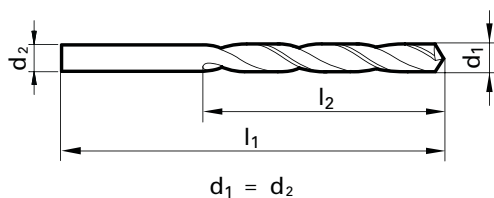
Coating

Diamond coated

Shank



| Material                 | Suitability |
|--------------------------|-------------|
| <b>P</b> Steel           |             |
| <b>M</b> Stainless steel |             |
| <b>K</b> Cast iron       |             |
| <b>N</b> Aluminum        |             |
| <b>S</b> Ni / Ti alloys  |             |
| <b>H</b> Hardened steel  |             |
| CFRP                     | ●           |
| ●=Optimal ○=Secondary    |             |



| d1     |        | Approx.<br>Hole Dia. | l1     | l2    | SOBO no.  |
|--------|--------|----------------------|--------|-------|-----------|
| mm     | inch   |                      | mm     | mm    |           |
| 2.489  | 0.0980 | #40                  | 43.00  | 14.00 | 344001454 |
| 3.264  | 0.1285 | #30                  | 49.00  | 18.00 | 344001455 |
| 3.607  | 0.1420 |                      | 52.00  | 20.00 | 344001456 |
| 4.229  | 0.1665 | #19                  | 58.00  | 24.00 | 344001457 |
| 4.404  | 0.1734 | #17                  | 58.00  | 24.00 | 344001458 |
| 4.864  | 0.1915 | #11                  | 62.00  | 26.00 | 344001459 |
| 5.639  | 0.2220 | #2                   | 66.00  | 28.00 | 344001460 |
| 6.375  | 0.2510 | 1/4                  | 70.00  | 31.00 | 344001461 |
| 7.963  | 0.3135 | 5/16                 | 79.00  | 37.00 | 344001462 |
| 9.550  | 0.3760 | 3/8                  | 89.00  | 43.00 | 344001463 |
| 11.138 | 0.4385 | 7/16                 | 95.00  | 47.00 | 344001464 |
| 12.725 | 0.5010 | 1/2                  | 102.00 | 51.00 | 344001465 |

### Operating Parameters:

| Material | Cutting speed<br>SFM | Feed Rate - IPR |                 |                  |                 |                 |
|----------|----------------------|-----------------|-----------------|------------------|-----------------|-----------------|
|          |                      | 1/8<br>(3.17mm) | 1/4<br>(6.35mm) | 5/16<br>(7.94mm) | 3/8<br>(9.52mm) | 1/2<br>(12.7mm) |
| CFRP     | 350                  | 0.0020          | 0.0025          | 0.0032           | 0.0040          | 0.0050          |

\* air cooling is recommended for optimal chip evacuation and tool life

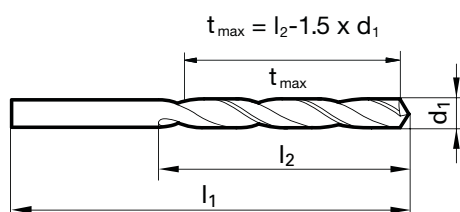


**AeroX HSCO split point jobber drills**
**Series**
**1018**
**Tool material**
**M42**
**Coating**
**Bronze Oxide**
**Shank**


| Material              |                 | Suitability |
|-----------------------|-----------------|-------------|
| <b>P</b>              | Steel           | ●           |
| <b>M</b>              | Stainless steel | ●           |
| <b>K</b>              | Cast iron       | ●           |
| <b>N</b>              | Aluminum        | ●           |
| <b>S</b>              | Ni / Ti alloys  | ●           |
| <b>H</b>              | Hardened steel  | ○           |
|                       | CFRP            |             |
| ●=Optimal ○=Secondary |                 |             |

web thinning  $\geq \varnothing 1.000$  • optimized NAS 907 split point • 8% cobalt-alloyed  
HSCO high speed steel for maximum tool life, high thermal resistance and hardness

unalloyed and high-alloyed steel materials • cast materials • non-ferrous metals • Titanium and Titanium alloys


**Shank diameter = cut diameter**

| Diameter (d <sub>1</sub> ) |          |      | l <sub>1</sub><br>mm | t <sub>max</sub><br>mm | l <sub>2</sub><br>mm | EDP Number    |
|----------------------------|----------|------|----------------------|------------------------|----------------------|---------------|
| inch                       | wire/ltr | mm   |                      |                        |                      |               |
| 0.0394                     |          | 1.00 | 34.00                | 10.50                  | 12.00                | 9010180010000 |
| 0.0433                     |          | 1.10 | 36.00                | 12.35                  | 14.00                | 9010180011000 |
| 0.0472                     |          | 1.20 | 38.00                | 14.20                  | 16.00                | 9010180012000 |
| 0.0512                     |          | 1.30 | 38.00                | 14.05                  | 16.00                | 9010180013000 |
| 0.0551                     |          | 1.40 | 40.00                | 15.90                  | 18.00                | 9010180014000 |
| 0.0591                     |          | 1.50 | 40.00                | 15.75                  | 18.00                | 9010180015000 |
| 0.0626                     | 1/16     | 1.59 | 43.00                | 17.62                  | 20.00                | 9010180015900 |
| 0.0630                     |          | 1.60 | 43.00                | 17.60                  | 20.00                | 9010180016000 |
| 0.0669                     |          | 1.70 | 43.00                | 17.45                  | 20.00                | 9010180017000 |
| 0.0709                     |          | 1.80 | 46.00                | 19.30                  | 22.00                | 9010180018000 |
| 0.0748                     |          | 1.90 | 46.00                | 19.15                  | 22.00                | 9010180019000 |
| 0.0780                     | 5/64     | 1.98 | 49.00                | 21.03                  | 24.00                | 9010180019800 |
| 0.0787                     |          | 2.00 | 49.00                | 21.00                  | 24.00                | 9010180020000 |
| 0.0827                     |          | 2.10 | 49.00                | 20.85                  | 24.00                | 9010180021000 |
| 0.0866                     |          | 2.20 | 53.00                | 23.70                  | 27.00                | 9010180022000 |
| 0.0906                     |          | 2.30 | 53.00                | 23.55                  | 27.00                | 9010180023000 |
| 0.0937                     | 3/32     | 2.38 | 57.00                | 26.43                  | 30.00                | 9010180023800 |
| 0.0945                     |          | 2.40 | 57.00                | 26.40                  | 30.00                | 9010180024000 |
| 0.0984                     |          | 2.50 | 57.00                | 26.25                  | 30.00                | 9010180025000 |
| 0.1024                     |          | 2.60 | 57.00                | 26.10                  | 30.00                | 9010180026000 |
| 0.1063                     |          | 2.70 | 61.00                | 28.95                  | 33.00                | 9010180027000 |
| 0.1094                     | 7/64     | 2.78 | 61.00                | 28.83                  | 33.00                | 9010180027800 |
| 0.1102                     |          | 2.80 | 61.00                | 28.80                  | 33.00                | 9010180028000 |
| 0.1142                     |          | 2.90 | 61.00                | 28.65                  | 33.00                | 9010180029000 |
| 0.1181                     |          | 3.00 | 61.00                | 28.50                  | 33.00                | 9010180030000 |
| 0.1220                     |          | 3.10 | 65.00                | 31.35                  | 36.00                | 9010180031000 |
| 0.1248                     | 1/8      | 3.17 | 65.00                | 31.25                  | 36.00                | 9010180031700 |
| 0.1260                     |          | 3.20 | 65.00                | 31.20                  | 36.00                | 9010180032000 |
| 0.1280                     |          | 3.25 | 65.00                | 31.13                  | 36.00                | 9010180032500 |
| 0.1299                     |          | 3.30 | 65.00                | 31.05                  | 36.00                | 9010180033000 |
| 0.1339                     |          | 3.40 | 70.00                | 33.90                  | 39.00                | 9010180034000 |
| 0.1378                     |          | 3.50 | 70.00                | 33.75                  | 39.00                | 9010180035000 |
| 0.1406                     | 9/64     | 3.57 | 70.00                | 33.65                  | 39.00                | 9010180035700 |
| 0.1417                     |          | 3.60 | 70.00                | 33.60                  | 39.00                | 9010180036000 |



| Diameter (d <sub>1</sub> ) |          |      | l <sub>1</sub><br>mm | t <sub>max</sub><br>mm | l <sub>2</sub><br>mm | EDP Number    |
|----------------------------|----------|------|----------------------|------------------------|----------------------|---------------|
| inch                       | wire/ltr | mm   |                      |                        |                      |               |
| 0.1457                     |          | 3.70 | 70.00                | 33.45                  | 39.00                | 9010180037000 |
| 0.1496                     |          | 3.80 | 75.00                | 37.30                  | 43.00                | 9010180038000 |
| 0.1535                     |          | 3.90 | 75.00                | 37.15                  | 43.00                | 9010180039000 |
| 0.1563                     | 5/32     | 3.97 | 75.00                | 37.05                  | 43.00                | 9010180039700 |
| 0.1575                     |          | 4.00 | 75.00                | 37.00                  | 43.00                | 9010180040000 |
| 0.1614                     |          | 4.10 | 75.00                | 36.85                  | 43.00                | 9010180041000 |
| 0.1654                     |          | 4.20 | 75.00                | 36.70                  | 43.00                | 9010180042000 |
| 0.1693                     |          | 4.30 | 80.00                | 40.55                  | 47.00                | 9010180043000 |
| 0.1732                     |          | 4.40 | 80.00                | 40.40                  | 47.00                | 9010180044000 |
| 0.1772                     |          | 4.50 | 80.00                | 40.25                  | 47.00                | 9010180045000 |
| 0.1811                     |          | 4.60 | 80.00                | 40.10                  | 47.00                | 9010180046000 |
| 0.1850                     |          | 4.70 | 80.00                | 39.95                  | 47.00                | 9010180047000 |
| 0.1874                     | 3/16     | 4.76 | 86.00                | 44.86                  | 52.00                | 9010180047600 |
| 0.1890                     |          | 4.80 | 86.00                | 44.80                  | 52.00                | 9010180048000 |
| 0.1909                     |          | 4.85 | 86.00                | 44.73                  | 52.00                | 9010180048500 |
| 0.1929                     |          | 4.90 | 86.00                | 44.65                  | 52.00                | 9010180049000 |
| 0.1969                     |          | 5.00 | 86.00                | 44.50                  | 52.00                | 9010180050000 |
| 0.2008                     |          | 5.10 | 86.00                | 44.35                  | 52.00                | 9010180051000 |
| 0.2031                     | 13/64    | 5.16 | 86.00                | 44.26                  | 52.00                | 9010180051600 |
| 0.2047                     |          | 5.20 | 86.00                | 44.20                  | 52.00                | 9010180052000 |
| 0.2087                     |          | 5.30 | 86.00                | 44.05                  | 52.00                | 9010180053000 |
| 0.2126                     |          | 5.40 | 93.00                | 48.90                  | 57.00                | 9010180054000 |
| 0.2165                     |          | 5.50 | 93.00                | 48.75                  | 57.00                | 9010180055000 |
| 0.2189                     | 7/32     | 5.56 | 93.00                | 48.66                  | 57.00                | 9010180055600 |
| 0.2205                     |          | 5.60 | 93.00                | 48.60                  | 57.00                | 9010180056000 |
| 0.2244                     |          | 5.70 | 93.00                | 48.45                  | 57.00                | 9010180057000 |
| 0.2283                     |          | 5.80 | 93.00                | 48.30                  | 57.00                | 9010180058000 |
| 0.2323                     |          | 5.90 | 93.00                | 48.15                  | 57.00                | 9010180059000 |
| 0.2343                     | 15/64    | 5.95 | 93.00                | 48.08                  | 57.00                | 9010180059500 |
| 0.2362                     |          | 6.00 | 93.00                | 48.00                  | 57.00                | 9010180060000 |
| 0.2402                     |          | 6.10 | 101.00               | 53.85                  | 63.00                | 9010180061000 |
| 0.2441                     |          | 6.20 | 101.00               | 53.70                  | 63.00                | 9010180062000 |
| 0.2480                     |          | 6.30 | 101.00               | 53.55                  | 63.00                | 9010180063000 |
| 0.2500                     | 1/4      | 6.35 | 101.00               | 53.48                  | 63.00                | 9010180063500 |
| 0.2520                     |          | 6.40 | 101.00               | 53.40                  | 63.00                | 9010180064000 |
| 0.2559                     |          | 6.50 | 101.00               | 53.25                  | 63.00                | 9010180065000 |
| 0.2598                     |          | 6.60 | 101.00               | 53.10                  | 63.00                | 9010180066000 |
| 0.2638                     |          | 6.70 | 101.00               | 52.95                  | 63.00                | 9010180067000 |
| 0.2677                     |          | 6.80 | 109.00               | 58.80                  | 69.00                | 9010180068000 |
| 0.2717                     |          | 6.90 | 109.00               | 58.65                  | 69.00                | 9010180069000 |
| 0.2756                     |          | 7.00 | 109.00               | 58.50                  | 69.00                | 9010180070000 |
| 0.2795                     |          | 7.10 | 109.00               | 58.35                  | 69.00                | 9010180071000 |
| 0.2811                     | 9/32     | 7.14 | 109.00               | 58.29                  | 69.00                | 9010180071400 |
| 0.2835                     |          | 7.20 | 109.00               | 58.20                  | 69.00                | 9010180072000 |
| 0.2874                     |          | 7.30 | 109.00               | 58.05                  | 69.00                | 9010180073000 |
| 0.2913                     |          | 7.40 | 109.00               | 57.90                  | 69.00                | 9010180074000 |
| 0.2953                     |          | 7.50 | 109.00               | 57.75                  | 69.00                | 9010180075000 |
| 0.2969                     | 19/64    | 7.54 | 117.00               | 63.69                  | 75.00                | 9010180075400 |
| 0.2992                     |          | 7.60 | 117.00               | 63.60                  | 75.00                | 9010180076000 |
| 0.3031                     |          | 7.70 | 117.00               | 63.45                  | 75.00                | 9010180077000 |
| 0.3071                     |          | 7.80 | 117.00               | 63.30                  | 75.00                | 9010180078000 |
| 0.3110                     |          | 7.90 | 117.00               | 63.15                  | 75.00                | 9010180079000 |
| 0.3125                     | 5/16     | 7.94 | 117.00               | 63.09                  | 75.00                | 9010180079400 |
| 0.3150                     |          | 8.00 | 117.00               | 63.00                  | 75.00                | 9010180080000 |
| 0.3189                     |          | 8.10 | 117.00               | 62.85                  | 75.00                | 9010180081000 |
| 0.3228                     |          | 8.20 | 117.00               | 62.70                  | 75.00                | 9010180082000 |
| 0.3268                     |          | 8.30 | 117.00               | 62.55                  | 75.00                | 9010180083000 |
| 0.3280                     | 21/64    | 8.33 | 117.00               | 62.51                  | 75.00                | 9010180083300 |
| 0.3307                     |          | 8.40 | 117.00               | 62.40                  | 75.00                | 9010180084000 |
| 0.3346                     |          | 8.50 | 117.00               | 62.25                  | 75.00                | 9010180085000 |
| 0.3386                     |          | 8.60 | 125.00               | 68.10                  | 81.00                | 9010180086000 |



| Diameter (d <sub>1</sub> ) |          |       | l <sub>1</sub><br>mm | t <sub>max</sub><br>mm | l <sub>2</sub><br>mm | EDP Number    |
|----------------------------|----------|-------|----------------------|------------------------|----------------------|---------------|
| inch                       | wire/ltr | mm    |                      |                        |                      |               |
| 0.3425                     |          | 8.70  | 125.00               | 67.95                  | 81.00                | 9010180087000 |
| 0.3437                     | 11/32    | 8.73  | 125.00               | 67.91                  | 81.00                | 9010180087300 |
| 0.3465                     |          | 8.80  | 125.00               | 67.80                  | 81.00                | 9010180088000 |
| 0.3504                     |          | 8.90  | 125.00               | 67.65                  | 81.00                | 9010180089000 |
| 0.3543                     |          | 9.00  | 125.00               | 67.50                  | 81.00                | 9010180090000 |
| 0.3583                     |          | 9.10  | 125.00               | 67.35                  | 81.00                | 9010180091000 |
| 0.3594                     | 23/64    | 9.13  | 125.00               | 67.31                  | 81.00                | 9010180091300 |
| 0.3622                     |          | 9.20  | 125.00               | 67.20                  | 81.00                | 9010180092000 |
| 0.3661                     |          | 9.30  | 125.00               | 67.05                  | 81.00                | 9010180093000 |
| 0.3740                     |          | 9.50  | 125.00               | 66.75                  | 81.00                | 9010180095000 |
| 0.3750                     | 3/8      | 9.52  | 133.00               | 72.72                  | 87.00                | 9010180095200 |
| 0.3780                     |          | 9.60  | 133.00               | 72.60                  | 87.00                | 9010180096000 |
| 0.3819                     |          | 9.70  | 133.00               | 72.45                  | 87.00                | 9010180097000 |
| 0.3858                     |          | 9.80  | 133.00               | 72.30                  | 87.00                | 9010180098000 |
| 0.3898                     |          | 9.90  | 133.00               | 72.15                  | 87.00                | 9010180099000 |
| 0.3906                     | 25/64    | 9.92  | 133.00               | 72.12                  | 87.00                | 9010180099200 |
| 0.3937                     |          | 10.00 | 133.00               | 72.00                  | 87.00                | 9010180100000 |
| 0.3976                     |          | 10.10 | 133.00               | 71.85                  | 87.00                | 9010180101000 |
| 0.4016                     |          | 10.20 | 133.00               | 71.70                  | 87.00                | 9010180102000 |
| 0.4055                     |          | 10.30 | 133.00               | 71.55                  | 87.00                | 9010180103000 |
| 0.4063                     | 13/32    | 10.32 | 133.00               | 71.52                  | 87.00                | 9010180103200 |
| 0.4134                     |          | 10.50 | 133.00               | 71.25                  | 87.00                | 9010180105000 |
| 0.4220                     | 27/64    | 10.72 | 142.00               | 77.92                  | 94.00                | 9010180107200 |
| 0.4252                     |          | 10.80 | 142.00               | 77.80                  | 94.00                | 9010180108000 |
| 0.4331                     |          | 11.00 | 142.00               | 77.50                  | 94.00                | 9010180110000 |
| 0.4374                     | 7/16     | 11.11 | 142.00               | 77.34                  | 94.00                | 9010180111100 |
| 0.4528                     |          | 11.50 | 142.00               | 76.75                  | 94.00                | 9010180115000 |
| 0.4531                     | 29/64    | 11.51 | 142.00               | 76.74                  | 94.00                | 9010180115100 |
| 0.4689                     | 15/32    | 11.91 | 151.00               | 83.14                  | 101.00               | 9010180119100 |
| 0.4724                     |          | 12.00 | 151.00               | 83.00                  | 101.00               | 9010180120000 |
| 0.4803                     |          | 12.20 | 151.00               | 82.70                  | 101.00               | 9010180122000 |
| 0.4843                     | 31/64    | 12.30 | 151.00               | 82.55                  | 101.00               | 9010180123000 |
| 0.4921                     |          | 12.50 | 151.00               | 82.25                  | 101.00               | 9010180125000 |
| 0.5000                     | 1/2      | 12.70 | 151.00               | 81.95                  | 101.00               | 9010180127000 |
| 0.5039                     |          | 12.80 | 151.00               | 81.80                  | 101.00               | 9010180128000 |
| 0.5118                     |          | 13.00 | 151.00               | 81.50                  | 101.00               | 9010180130000 |

# Series # 1018

| Material group                                      | Hardness             |                         | SFM               | Feed Rate - IPR            |                            |                            |                            |                            |                            |                            |
|-----------------------------------------------------|----------------------|-------------------------|-------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
|                                                     | HRC                  | BHN                     |                   | 1/64 in.<br>.5 mm          | 1/16 in.<br>1.59 mm        | 1/8 in.<br>3.17 mm         | 1/4 in.<br>6.35 mm         | 3/8 in.<br>9.52 mm         | 1/2 in.<br>12.70 mm        | 5/8 in.<br>15.87 mm        |
| Common structural steels                            | -<br>≤ 32            | ≤ 150<br>≤ 301          | 115<br>100        | 0.0005<br>0.0004           | 0.0007<br>0.0006           | 0.0039<br>0.0031           | 0.0063<br>0.0049           | 0.0098<br>0.0079           | 0.0098<br>0.0079           | 0.0124<br>0.0098           |
| Free-cutting steels                                 | ≤ 25<br>≤ 32         | ≤ 255<br>≤ 301          | 130<br>130        | 0.0005<br>0.0004           | 0.0007<br>0.0006           | 0.0039<br>0.0031           | 0.0063<br>0.0049           | 0.0098<br>0.0079           | 0.0098<br>0.0079           | 0.0124<br>0.0098           |
| Unalloyed heat-treatable steels                     | ≤ 20<br>≤ 25<br>≤ 32 | ≤ 220<br>≤ 255<br>≤ 301 | 130<br>130<br>115 | 0.0004<br>0.0004<br>0.0003 | 0.0006<br>0.0006<br>0.0006 | 0.0031<br>0.0031<br>0.0025 | 0.0049<br>0.0049<br>0.0039 | 0.0079<br>0.0079<br>0.0063 | 0.0079<br>0.0079<br>0.0063 | 0.0098<br>0.0098<br>0.0079 |
| Alloyed heat-treatable steels                       | ≤ 32<br>≤ 43         | ≤ 301<br>≤ 402          | 65<br>50          | 0.0003<br>0.0003           | 0.0006<br>0.0005           | 0.0025<br>0.0020           | 0.0039<br>0.0031           | 0.0063<br>0.0049           | 0.0063<br>0.0049           | 0.0079<br>0.0063           |
| Unalloyed case hardened steels                      | ≤ 25                 | ≤ 255                   | 120               | 0.0005                     | 0.0007                     | 0.0039                     | 0.0063                     | 0.0098                     | 0.0098                     | 0.0124                     |
| Alloyed case hardened steels                        | ≤ 32<br>≤ 43         | ≤ 301<br>≤ 402          | 65<br>50          | 0.0003<br>0.0003           | 0.0005<br>0.0005           | 0.0020<br>0.0020           | 0.0031<br>0.0031           | 0.0049<br>0.0049           | 0.0049<br>0.0049           | 0.0063<br>0.0063           |
| Nitriding steels                                    | ≤ 32<br>≤ 43         | ≤ 301<br>≤ 402          | 50<br>40          | 0.0003<br>0.0003           | 0.0006<br>0.0005           | 0.0025<br>0.0020           | 0.0039<br>0.0031           | 0.0063<br>0.0049           | 0.0063<br>0.0049           | 0.0079<br>0.0063           |
| Tool steels                                         | ≤ 25<br>≤ 43         | ≤ 255<br>≤ 402          | 50<br>40          | 0.0003<br>0.0003           | 0.0005<br>0.0005           | 0.0020<br>0.0020           | 0.0031<br>0.0031           | 0.0049<br>0.0049           | 0.0049<br>0.0049           | 0.0063<br>0.0063           |
| High speed steels                                   | ≤ 43                 | ≤ 402                   | 50                | 0.0003                     | 0.0005                     | 0.0020                     | 0.0031                     | 0.0049                     | 0.0049                     | 0.0063                     |
| Spring steels                                       | ≤ 38                 | ≤ 354                   | 25                | 0.0002                     | 0.0003                     | 0.0016                     | 0.0025                     | 0.0039                     | 0.0039                     | 0.0049                     |
| Stainless steels, sulphured                         | ≤ 28                 | ≤ 273                   | 60                | 0.0003                     | 0.0005                     | 0.0020                     | 0.0031                     | 0.0049                     | 0.0049                     | 0.0063                     |
| austenitic                                          | ≤ 36                 | ≤ 337                   | 45                | 0.0003                     | 0.0005                     | 0.0020                     | 0.0031                     | 0.0049                     | 0.0049                     | 0.0063                     |
| martensitic                                         | ≤ 46                 | ≤ 435                   | 50                | 0.0003                     | 0.0005                     | 0.0020                     | 0.0031                     | 0.0049                     | 0.0049                     | 0.0063                     |
| Hardened steels                                     | ≤ 48<br>≤ 66         | ≤ 460<br>-              | 15                | 0.0002                     | 0.0002                     | 0.0013                     | 0.0020                     | 0.0031                     | 0.0031                     | 0.0039                     |
| Cast iron                                           | ≤ 23<br>≤ 38         | ≤ 242<br>≤ 354          | 115<br>100        | 0.0005<br>0.0005           | 0.0007<br>0.0007           | 0.0039<br>0.0039           | 0.0063<br>0.0063           | 0.0098<br>0.0098           | 0.0098<br>0.0098           | 0.0124<br>0.0124           |
| Spheroidal graphite iron and<br>malleable cast iron | ≤ 23<br>≤ 38         | ≤ 242<br>≤ 354          | 100<br>90         | 0.0005<br>0.0005           | 0.0007<br>0.0007           | 0.0039<br>0.0039           | 0.0063<br>0.0063           | 0.0098<br>0.0098           | 0.0098<br>0.0098           | 0.0124<br>0.0124           |
| Chilled cast iron                                   | ≤ 38                 | ≤ 354                   | 35                | 0.0003                     | 0.0005                     | 0.0020                     | 0.0031                     | 0.0049                     | 0.0049                     | 0.0063                     |
| New cast materials GGV                              | ≤ 20<br>≤ 32         | ≤ 220<br>≤ 301          |                   |                            |                            |                            |                            |                            |                            |                            |
| New cast materials ADI                              | ≤ 32<br>≤ 43         | ≤ 301<br>≤ 402          |                   |                            |                            |                            |                            |                            |                            |                            |
| Special alloys                                      | ≤ 54                 | ≤ 549                   | 25                | 0.0002                     | 0.0002                     | 0.0013                     | 0.0020                     | 0.0031                     | 0.0031                     | 0.0039                     |
| Ti and Ti-alloys                                    | ≤ 25<br>≤ 43         | ≤ 255<br>≤ 402          | 35<br>20          | 0.0002<br>0.0002           | 0.0003<br>0.0003           | 0.0016<br>0.0016           | 0.0025<br>0.0025           | 0.0039<br>0.0039           | 0.0039<br>0.0039           | 0.0049<br>0.0049           |
| Aluminium and Al-alloys                             | -                    | ≤ 120                   | 295               | 0.0006                     | 0.0008                     | 0.0049                     | 0.0079                     | 0.0124                     | 0.0124                     | 0.0157                     |
| Al wrought alloys                                   | -                    | ≤ 200                   | 295               | 0.0006                     | 0.0008                     | 0.0049                     | 0.0079                     | 0.0124                     | 0.0124                     | 0.0157                     |
| Al cast alloys ≤ 10 % Si                            | -                    | ≤ 180                   | 260               | 0.0006                     | 0.0008                     | 0.0049                     | 0.0079                     | 0.0124                     | 0.0124                     | 0.0157                     |
| ≤ 24 % Si                                           | -                    | ≤ 180                   | 230               | 0.0005                     | 0.0007                     | 0.0039                     | 0.0063                     | 0.0098                     | 0.0098                     | 0.0124                     |
| Magnesium alloys                                    | -                    | ≤ 120                   | 230               | 0.0005                     | 0.0007                     | 0.0039                     | 0.0063                     | 0.0098                     | 0.0098                     | 0.0124                     |
| Copper, low-alloyed                                 | -                    | ≤ 150                   | 230               | 0.0004                     | 0.0006                     | 0.0031                     | 0.0049                     | 0.0079                     | 0.0079                     | 0.0098                     |
| Brass, short-chipping                               | -                    | ≤ 180                   | 195               | 0.0004                     | 0.0006                     | 0.0031                     | 0.0049                     | 0.0079                     | 0.0079                     | 0.0098                     |
| long-chipping                                       | -                    | ≤ 180                   | 130               | 0.0004                     | 0.0006                     | 0.0031                     | 0.0049                     | 0.0079                     | 0.0079                     | 0.0098                     |
| Bronze, short-chipping                              | -                    | ≤ 180                   | 115               | 0.0003                     | 0.0006                     | 0.0025                     | 0.0039                     | 0.0063                     | 0.0063                     | 0.0079                     |
| long-chipping                                       | ≤ 25                 | ≤ 255                   | 110               | 0.0003                     | 0.0006                     | 0.0025                     | 0.0039                     | 0.0063                     | 0.0063                     | 0.0079                     |
| Bronze, long-chipping                               | ≤ 25<br>≤ 32         | ≤ 255<br>≤ 301          | 65<br>50          | 0.0003<br>0.0003           | 0.0006<br>0.0006           | 0.0025<br>0.0025           | 0.0039<br>0.0039           | 0.0063<br>0.0063           | 0.0063<br>0.0063           | 0.0079<br>0.0079           |
| Duroplastics                                        |                      |                         | 65                | 0.0003                     | 0.0006                     | 0.0025                     | 0.0039                     | 0.0063                     | 0.0063                     | 0.0079                     |
| Thermoplastics                                      |                      |                         | 100               | 0.0004                     | 0.0006                     | 0.0031                     | 0.0049                     | 0.0079                     | 0.0079                     | 0.0098                     |

## UNJC through hole tap

for Ti/Ni and Ti/Ni Alloys

| Material                 |                 | Suitability |
|--------------------------|-----------------|-------------|
| <b>P</b>                 | Steel           |             |
| <b>M</b>                 | Stainless steel |             |
| <b>K</b>                 | Cast iron       |             |
| <b>N</b>                 | Aluminum        |             |
| <b>S</b>                 | Ni / Ti alloys  | ●           |
| <b>H</b>                 | Hardened steel  |             |
|                          | CFRP            |             |
| ●=Optimal    ○=Secondary |                 |             |

Series

1059

Tool material

HSS-E-PM

Coating

TiCN

Standard

DIN 371/376

Spiral Point

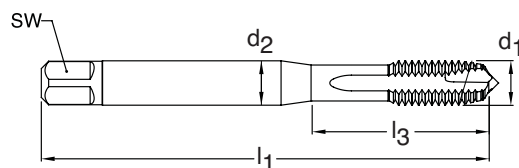
Straight flute

Chamfer Form

B • 3.5 - 5

Class of Fit

3BX



| d1 - P  | H limits | Tap drill range inch | No. of Flutes | d2<br>mm | SW<br>mm | l1<br>mm | l3<br>mm | Code no. | EDP Number    |
|---------|----------|----------------------|---------------|----------|----------|----------|----------|----------|---------------|
| 6-32    | H2/H3    | 0.108 - 0.116        | 3             | 4.00     | 3.00     | 56.00    | 20.00    | 3.505    | 9010590035050 |
| 8-32    | H2/H3    | 0.134 - 0.142        | 3             | 4.50     | 3.40     | 63.00    | 21.00    | 4.166    | 9010590041660 |
| 10-24   | H3/H4    | 0.149 - 0.160        | 3             | 6.00     | 4.90     | 70.00    | 25.00    | 4.826    | 9010590048260 |
| 12-24   | H3/H4    | 0.175 - 0.185        | 3             | 6.00     | 4.90     | 80.00    | 30.00    | 5.486    | 9010590054860 |
| 1/4-20  | H3/H4    | 0.201 - 0.212        | 4             | 7.00     | 5.50     | 80.00    | 30.00    | 6.350    | 9010590063500 |
| 5/16-18 | H3/H4    | 0.258 - 0.269        | 4             | 8.00     | 6.20     | 90.00    | 35.00    | 7.938    | 9010590079380 |
| 3/8-16  | H3/H4    | 0.314 - 0.325        | 4             | 10.00    | 8.00     | 100.00   | 39.00    | 9.525    | 9010590095250 |
| 7/16-14 | H3/H4    | 0.368 - 0.379        | 4             | 8.00     | 6.20     | 100.00   | N/A      | 11.113   | 9010590111130 |
| 1/2-13  | H3/H4    | 0.425 - 0.437        | 4             | 9.00     | 7.00     | 110.00   | N/A      | 12.700   | 9010590127000 |
| 5/8-11  | H3/H4    | 0.536 - 0.547        | 4             | 12.00    | 9.00     | 110.00   | N/A      | 15.875   | 9010590158750 |

| Material group         | Approximate Rc | Approximate HB | Recommended SFM |             |               |             |               |             |
|------------------------|----------------|----------------|-----------------|-------------|---------------|-------------|---------------|-------------|
|                        |                |                | HSS-E           |             | HSS-E-PM      |             | Solid carbide |             |
|                        |                |                | bright finish   | hard coated | bright finish | hard coated | bright finish | hard coated |
| Titanium and Ti-alloys | —              | 140-275        | —               | —           | —             | 20-30       | —             | —           |
|                        | —              | 300-380        | —               | —           | —             | 10-18       | —             | —           |
| Nickel and Ni-alloys   | —              | 200-300        | —               | —           | —             | 10-18       | —             | —           |
|                        | —              | >300           | —               | —           | —             | 6-12        | —             | —           |



# UNJC blind hole tap

for Ti and Ti Alloys

| Material                 |                 | Suitability |
|--------------------------|-----------------|-------------|
| <b>P</b>                 | Steel           |             |
| <b>M</b>                 | Stainless steel |             |
| <b>K</b>                 | Cast iron       |             |
| <b>N</b>                 | Aluminum        |             |
| <b>S</b>                 | Ni / Ti alloys  | ●           |
| <b>H</b>                 | Hardened steel  |             |
|                          | CFRP            |             |
| ●=Optimal    ○=Secondary |                 |             |

Series

1063

Tool material

HSS-E-PM

Coating

TiCN

Standard

DIN 371/376

Spiral Point

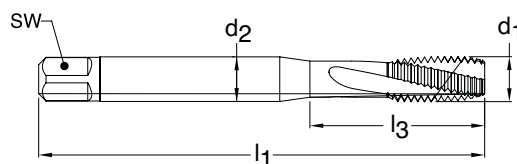
15° Helix

Chamfer Form

C • 2-3

Class of Fit

3BX



| d1 - P  | H limits | Tap drill range inch | No. of Flutes | d2<br>mm | SW<br>mm | l1<br>mm | l3<br>mm | Code no. | EDP Number    |
|---------|----------|----------------------|---------------|----------|----------|----------|----------|----------|---------------|
| 6-32    | H2/H3    | 0.108 - 0.116        | 3             | 4.00     | 3.00     | 56.00    | 20.00    | 3.505    | 9010630035050 |
| 8-32    | H2/H3    | 0.134 - 0.142        | 3             | 4.50     | 3.40     | 63.00    | 21.00    | 4.166    | 9010630041660 |
| 10-24   | H3/H4    | 0.149 - 0.160        | 3             | 6.00     | 4.90     | 70.00    | 25.00    | 4.826    | 9010630048260 |
| 12-24   | H3/H4    | 0.175 - 0.185        | 3             | 6.00     | 4.90     | 80.00    | 30.00    | 5.486    | 9010630054860 |
| 1/4-20  | H3/H4    | 0.201 - 0.212        | 3             | 7.00     | 5.50     | 80.00    | 30.00    | 6.350    | 9010630063500 |
| 5/16-18 | H3/H4    | 0.258 - 0.269        | 3             | 8.00     | 6.20     | 90.00    | 35.00    | 7.938    | 9010630079380 |
| 3/8-16  | H3/H4    | 0.314 - 0.325        | 3             | 10.00    | 8.00     | 100.00   | 39.00    | 9.525    | 9010630095250 |
| 7/16-14 | H3/H4    | 0.368 - 0.379        | 4             | 8.00     | 6.20     | 100.00   | N/A      | 11.113   | 9010630111130 |
| 1/2-13  | H3/H4    | 0.425 - 0.437        | 4             | 9.00     | 7.00     | 110.00   | N/A      | 12.700   | 9010630127000 |
| 5/8-11  | H3/H4    | 0.536 - 0.547        | 4             | 12.00    | 9.00     | 110.00   | N/A      | 15.875   | 9010630158750 |

| Material group         | Approximate Rc | Approximate HB | Recommended SFM |             |               |             |               |             |
|------------------------|----------------|----------------|-----------------|-------------|---------------|-------------|---------------|-------------|
|                        |                |                | HSS-E           |             | HSS-E-PM      |             | Solid carbide |             |
|                        |                |                | bright finish   | hard coated | bright finish | hard coated | bright finish | hard coated |
| Titanium and Ti-alloys | —              | 140-275        | —               | —           | —             | 20-30       | —             | —           |
|                        | —              | 300-380        | —               | —           | —             | 10-18       | —             | —           |
| Nickel and Ni-alloys   | —              | 200-300        | —               | —           | —             | 10-18       | —             | —           |
|                        | —              | >300           | —               | —           | —             | 6-12        | —             | —           |

# UNJC blind hole tap

for NI and NI Alloys

| Material                 |                 | Suitability |
|--------------------------|-----------------|-------------|
| <b>P</b>                 | Steel           |             |
| <b>M</b>                 | Stainless steel |             |
| <b>K</b>                 | Cast iron       |             |
| <b>N</b>                 | Aluminum        |             |
| <b>S</b>                 | Ni / Ti alloys  | ●           |
| <b>H</b>                 | Hardened steel  |             |
|                          | CFRP            |             |
| ●=Optimal    ○=Secondary |                 |             |

Series

1067

Tool material

HSS-E-PM

Coating

TiAlN

Standard

DIN 371/376

Spiral Point

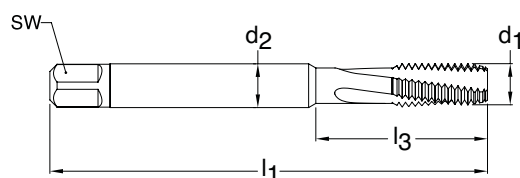
10° Helix

Chamfer Form

C • 2-3

Class of Fit

3BX



| d1 - P  | H limits | Tap drill range inch | No. of Flutes | d2<br>mm | SW<br>mm | l1<br>mm | l3<br>mm | Code no. | EDP Number    |
|---------|----------|----------------------|---------------|----------|----------|----------|----------|----------|---------------|
| 6-32    | H2/H3    | 0.108 - 0.116        | 3             | 4.00     | 3.00     | 56.00    | 20.00    | 3.505    | 9010670035050 |
| 8-32    | H2/H3    | 0.134 - 0.142        | 3             | 4.50     | 3.40     | 63.00    | 21.00    | 4.166    | 9010670041660 |
| 10-24   | H3/H4    | 0.149 - 0.160        | 3             | 6.00     | 4.90     | 70.00    | 25.00    | 4.826    | 9010670048260 |
| 12-24   | H3/H4    | 0.175 - 0.185        | 3             | 6.00     | 4.90     | 80.00    | 30.00    | 5.486    | 9010670054860 |
| 1/4-20  | H3/H4    | 0.201 - 0.212        | 3             | 7.00     | 5.50     | 80.00    | 30.00    | 6.350    | 9010670063500 |
| 5/16-18 | H3/H4    | 0.258 - 0.269        | 3             | 8.00     | 6.20     | 90.00    | 35.00    | 7.938    | 9010670079380 |
| 3/8-16  | H3/H4    | 0.314 - 0.325        | 3             | 10.00    | 8.00     | 100.00   | 39.00    | 9.525    | 9010670095250 |
| 7/16-14 | H3/H4    | 0.368 - 0.379        | 4             | 8.00     | 6.20     | 100.00   | N/A      | 11.113   | 9010670111130 |
| 1/2-13  | H3/H4    | 0.425 - 0.437        | 4             | 9.00     | 7.00     | 110.00   | N/A      | 12.700   | 9010670127000 |
| 5/8-11  | H3/H4    | 0.536 - 0.547        | 4             | 12.00    | 9.00     | 110.00   | N/A      | 15.875   | 9010670158750 |

| Material group         | Approximate Rc | Approximate HB | Recommended SFM |             |               |             |               |             |
|------------------------|----------------|----------------|-----------------|-------------|---------------|-------------|---------------|-------------|
|                        |                |                | HSS-E           |             | HSS-E-PM      |             | Solid carbide |             |
|                        |                |                | bright finish   | hard coated | bright finish | hard coated | bright finish | hard coated |
| Titanium and Ti-alloys | —              | 140-275        | —               | —           | —             | 20-30       | —             | —           |
|                        | —              | 300-380        | —               | —           | —             | 10-18       | —             | —           |
| Nickel and Ni-alloys   | —              | 200-300        | —               | —           | —             | 10-18       | —             | —           |
|                        | —              | >300           | —               | —           | —             | 6-12        | —             | —           |



# UNJF through hole tap

for Ti/Ni and Ti/Ni Alloys

| Material                 |                 | Suitability |
|--------------------------|-----------------|-------------|
| <b>P</b>                 | Steel           |             |
| <b>M</b>                 | Stainless steel |             |
| <b>K</b>                 | Cast iron       |             |
| <b>N</b>                 | Aluminum        |             |
| <b>S</b>                 | Ni / Ti alloys  | ●           |
| <b>H</b>                 | Hardened steel  |             |
|                          | CFRP            |             |
| ●=Optimal    ○=Secondary |                 |             |

Series

1060

Tool material

HSS-E-PM

Coating

TiCN

Standard

DIN 371/376

Spiral Point

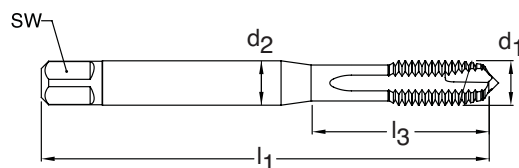
Straight flute

Chamfer Form

B • 3.5 - 5

Class of Fit

3BX



| d1 - P  | H limits | Tap drill range inch | No. of Flutes | d2<br>mm | SW<br>mm | l1<br>mm | l3<br>mm | Code no. | EDP Number    |
|---------|----------|----------------------|---------------|----------|----------|----------|----------|----------|---------------|
| 6-40    | H2/H3    | 0.114 - 0.120        | 3             | 4.00     | 3.00     | 56.00    | 20.00    | 3.505    | 9010600035050 |
| 10-32   | H2/H3    | 0.160 - 0.168        | 3             | 6.00     | 4.90     | 70.00    | 25.00    | 4.826    | 9010600048260 |
| 12-28   | H2/H3    | 0.181 - 0.190        | 3             | 6.00     | 4.90     | 80.00    | 30.00    | 5.486    | 9010600054860 |
| 1/4-28  | H3/H4    | 0.215 - 0.223        | 4             | 7.00     | 5.50     | 80.00    | 30.00    | 6.350    | 9010600063500 |
| 5/16-24 | H3/H4    | 0.272 - 0.280        | 4             | 8.00     | 6.20     | 90.00    | 35.00    | 7.938    | 9010600079380 |
| 3/8-24  | H3/H4    | 0.334 - 0.342        | 4             | 10.00    | 8.00     | 100.00   | 39.00    | 9.525    | 9010600095250 |
| 7/16-20 | H3/H4    | 0.389 - 0.397        | 4             | 8.00     | 6.20     | 100.00   | N/A      | 11.113   | 9010600111130 |
| 1/2-20  | H3/H4    | 0.451 - 0.459        | 4             | 9.00     | 7.00     | 100.00   | N/A      | 12.700   | 9010600127000 |
| 5/8-18  | H3/H4    | 0.571 - 0.579        | 4             | 12.00    | 9.00     | 100.00   | N/A      | 15.875   | 9010600158750 |

| Material group         | Approximate Rc | Approximate HB | Recommended SFM |             |               |             |               |             |
|------------------------|----------------|----------------|-----------------|-------------|---------------|-------------|---------------|-------------|
|                        |                |                | HSS-E           |             | HSS-E-PM      |             | Solid carbide |             |
|                        |                |                | bright finish   | hard coated | bright finish | hard coated | bright finish | hard coated |
| Titanium and Ti-alloys | —              | 140-275        | —               | —           | —             | 20-30       | —             | —           |
|                        | —              | 300-380        | —               | —           | —             | 10-18       | —             | —           |
| Nickel and Ni-alloys   | —              | 200-300        | —               | —           | —             | 10-18       | —             | —           |
|                        | —              | >300           | —               | —           | —             | 6-12        | —             | —           |



# UNJF blind hole tap

for Ti and Ti Alloys

| Material                 |                 | Suitability |
|--------------------------|-----------------|-------------|
| <b>P</b>                 | Steel           |             |
| <b>M</b>                 | Stainless steel |             |
| <b>K</b>                 | Cast iron       |             |
| <b>N</b>                 | Aluminum        |             |
| <b>S</b>                 | Ni / Ti alloys  | ●           |
| <b>H</b>                 | Hardened steel  |             |
|                          | CFRP            |             |
| ●=Optimal    ○=Secondary |                 |             |

Series

1064

Tool material

HSS-E-PM

Coating

TiCN

Standard

DIN 371/376

Spiral Point

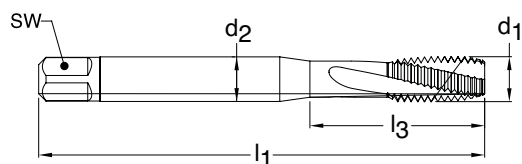
15° Helix

Chamfer Form

C • 2-3

Class of Fit

3BX



| d1 - P  | H limits | Tap drill range inch | No. of Flutes | d2<br>mm | SW<br>mm | l1<br>mm | l3<br>mm | Code no. | EDP Number    |
|---------|----------|----------------------|---------------|----------|----------|----------|----------|----------|---------------|
| 6-40    | H2/H3    | 0.114 - 0.120        | 3             | 4.00     | 3.00     | 56.00    | 20.00    | 3.505    | 9010640035050 |
| 8-36    | H2/H3    | 0.137 - 0.144        | 3             | 4.50     | 3.40     | 63.00    | 21.00    | 4.166    | 9010640041660 |
| 10-32   | H2/H3    | 0.160 - 0.168        | 3             | 6.00     | 4.90     | 70.00    | 25.00    | 4.826    | 9010640048260 |
| 12-28   | H3/H4    | 0.181 - 0.190        | 3             | 6.00     | 4.90     | 80.00    | 30.00    | 5.486    | 9010640054860 |
| 1/4-28  | H3/H4    | 0.215 - 0.223        | 3             | 7.00     | 5.50     | 80.00    | 30.00    | 6.350    | 9010640063500 |
| 5/16-24 | H3/H4    | 0.272 - 0.280        | 3             | 8.00     | 6.20     | 90.00    | 35.00    | 7.938    | 9010640079380 |
| 3/8-24  | H3/H4    | 0.334 - 0.342        | 3             | 10.00    | 8.00     | 100.00   | 39.00    | 9.525    | 9010640095250 |
| 7/16-20 | H3/H4    | 0.389 - 0.397        | 4             | 8.00     | 6.20     | 100.00   | N/A      | 11.113   | 9010640111130 |
| 1/2-20  | H3/H4    | 0.451 - 0.459        | 4             | 9.00     | 7.00     | 100.00   | N/A      | 12.700   | 9010640127000 |
| 5/8-18  | H4/H5    | 0.571 - 0.579        | 4             | 12.00    | 9.00     | 100.00   | N/A      | 15.875   | 9010640158750 |

| Material group         | Approximate Rc | Approximate HB | Recommended SFM |             |               |             |               |             |
|------------------------|----------------|----------------|-----------------|-------------|---------------|-------------|---------------|-------------|
|                        |                |                | HSS-E           |             | HSS-E-PM      |             | Solid carbide |             |
|                        |                |                | bright finish   | hard coated | bright finish | hard coated | bright finish | hard coated |
| Titanium and Ti-alloys | —              | 140-275        | —               | —           | —             | 20-30       | —             | —           |
|                        | —              | 300-380        | —               | —           | —             | 10-18       | —             | —           |
| Nickel and Ni-alloys   | —              | 200-300        | —               | —           | —             | 10-18       | —             | —           |
|                        | —              | >300           | —               | —           | —             | 6-12        | —             | —           |

**UNJF blind hole tap**

for NI and NI Alloys

| Material                 |                 | Suitability |
|--------------------------|-----------------|-------------|
| <b>P</b>                 | Steel           |             |
| <b>M</b>                 | Stainless steel |             |
| <b>K</b>                 | Cast iron       |             |
| <b>N</b>                 | Aluminum        |             |
| <b>S</b>                 | Ni / Ti alloys  | ●           |
| <b>H</b>                 | Hardened steel  |             |
|                          | CFRP            |             |
| ●=Optimal    ○=Secondary |                 |             |

Series

**1068**

Tool material

**HSS-E-PM**

Coating

TiAlN

Standard

DIN 371/376

Spiral Point

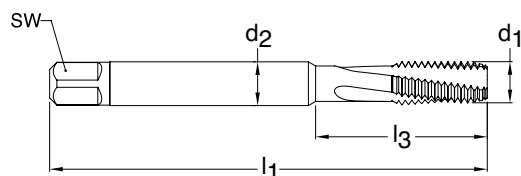
10° Helix

Chamfer Form

C • 2-3

Class of Fit

3BX



| d1 - P  | H limits | Tap drill range inch | No. of Flutes | d2<br>mm | SW<br>mm | l1<br>mm | l3<br>mm | Code no. | EDP Number    |
|---------|----------|----------------------|---------------|----------|----------|----------|----------|----------|---------------|
| 6-40    | H2/H3    | 0.114 - 0.120        | 3             | 4.00     | 3.00     | 56.00    | 20.00    | 3.505    | 9010680035050 |
| 8-36    | H2/H3    | 0.137 - 0.144        | 3             | 4.50     | 3.40     | 63.00    | 21.00    | 4.166    | 9010680041660 |
| 10-32   | H3/H4    | 0.160 - 0.168        | 3             | 6.00     | 4.90     | 70.00    | 25.00    | 4.826    | 9010680048260 |
| 12-28   | H3/H4    | 0.181 - 0.190        | 3             | 6.00     | 4.90     | 80.00    | 30.00    | 5.486    | 9010680054860 |
| 1/4-28  | H3/H4    | 0.215 - 0.223        | 3             | 7.00     | 5.50     | 80.00    | 30.00    | 6.350    | 9010680063500 |
| 5/16-24 | H3/H4    | 0.272 - 0.280        | 3             | 8.00     | 6.20     | 90.00    | 35.00    | 7.938    | 9010680079380 |
| 3/8-24  | H3/H4    | 0.334 - 0.342        | 3             | 10.00    | 8.00     | 100.00   | 39.00    | 9.525    | 9010680095250 |
| 7/16-20 | H3/H4    | 0.389 - 0.397        | 4             | 8.00     | 6.20     | 100.00   | N/A      | 11.113   | 9010680111130 |
| 1/2-20  | H3/H4    | 0.451 - 0.459        | 4             | 9.00     | 7.00     | 100.00   | N/A      | 12.700   | 9010680127000 |
| 5/8-18  | H3/H4    | 0.571 - 0.579        | 4             | 12.00    | 9.00     | 100.00   | N/A      | 15.875   | 9010680158750 |

| Material group         | Approximate Rc | Approximate HB | Recommended SFM |             |               |             |               |             |
|------------------------|----------------|----------------|-----------------|-------------|---------------|-------------|---------------|-------------|
|                        |                |                | HSS-E           |             | HSS-E-PM      |             | Solid carbide |             |
|                        |                |                | bright finish   | hard coated | bright finish | hard coated | bright finish | hard coated |
| Titanium and Ti-alloys | —              | 140-275        | —               | —           | —             | 20-30       | —             | —           |
|                        | —              | 300-380        | —               | —           | —             | 10-18       | —             | —           |
| Nickel and Ni-alloys   | —              | 200-300        | —               | —           | —             | 10-18       | —             | —           |
|                        | —              | >300           | —               | —           | —             | 6-12        | —             | —           |

**MJ through hole tap**

for Ti/Ni and Ti/Ni Alloys

| Material                 |                 | Suitability |
|--------------------------|-----------------|-------------|
| <b>P</b>                 | Steel           |             |
| <b>M</b>                 | Stainless steel |             |
| <b>K</b>                 | Cast iron       |             |
| <b>N</b>                 | Aluminum        |             |
| <b>S</b>                 | Ni / Ti alloys  | ●           |
| <b>H</b>                 | Hardened steel  |             |
|                          | CFRP            |             |
| ●=Optimal    ○=Secondary |                 |             |

Series

1057

Tool material

HSS-E-PM

Coating

TiCN

Standard

DIN 371/376

Spiral Point

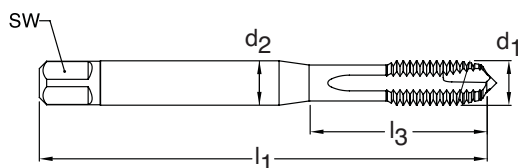
Straight flute

Chamfer Form

B • 3.5 - 5

Class of Fit

4HX



| d1 - P     | D limits | Tap drill range mm | No. of Flutes | d2<br>mm | SW<br>mm | l1<br>mm | l3<br>mm | Code no. | EDP Number    |
|------------|----------|--------------------|---------------|----------|----------|----------|----------|----------|---------------|
| M3 X 0.50  | D1/D2    | 2.513 - 2.653      | 3             | 3.50     | 2.70     | 56.00    | 18.00    | 3.000    | 9010570030000 |
| M4 X 0.70  | D2/D3    | 3.318 - 3.498      | 3             | 4.50     | 3.40     | 63.00    | 21.00    | 4.000    | 9010570040000 |
| M5 X 0.80  | D2/D3    | 4.221 - 4.421      | 3             | 6.00     | 4.90     | 70.00    | 25.00    | 5.000    | 9010570050000 |
| M6 X 1.00  | D3/D4    | 5.026 - 5.216      | 3             | 6.00     | 4.90     | 80.00    | 30.00    | 6.000    | 9010570060000 |
| M8 X 1.25  | D3/D4    | 6.782 - 6.994      | 4             | 8.00     | 6.20     | 90.00    | 35.00    | 8.000    | 9010570080000 |
| M10 X 1.50 | D3/D4    | 8.539 - 8.775      | 4             | 10.00    | 8.00     | 100.00   | 39.00    | 10.000   | 9010570100000 |
| M12 X 1.75 | D4/D5    | 10.295 - 10.560    | 4             | 9.00     | 7.00     | 110.00   | N/A      | 12.000   | 9010570120000 |
| M16 X 2.00 | D5/D6    | 14.051 - 14.351    | 4             | 12.00    | 9.00     | 110.00   | N/A      | 16.000   | 9010570160000 |

| Material group         | Approximate Rc | Approximate HB | Recommended SFM |             |               |             |               |             |
|------------------------|----------------|----------------|-----------------|-------------|---------------|-------------|---------------|-------------|
|                        |                |                | HSS-E           |             | HSS-E-PM      |             | Solid carbide |             |
|                        |                |                | bright finish   | hard coated | bright finish | hard coated | bright finish | hard coated |
| Titanium and Ti-alloys | —              | 140-275        | —               | —           | —             | 20-30       | —             | —           |
|                        | —              | 300-380        | —               | —           | —             | 10-18       | —             | —           |
| Nickel and Ni-alloys   | —              | 200-300        | —               | —           | —             | 10-18       | —             | —           |
|                        | —              | >300           | —               | —           | —             | 6-12        | —             | —           |

**MJ blind hole tap**

for Ti and Ti Alloys

| Material                 |                 | Suitability |
|--------------------------|-----------------|-------------|
| <b>P</b>                 | Steel           |             |
| <b>M</b>                 | Stainless steel |             |
| <b>K</b>                 | Cast iron       |             |
| <b>N</b>                 | Aluminum        |             |
| <b>S</b>                 | Ni / Ti alloys  | ●           |
| <b>H</b>                 | Hardened steel  |             |
|                          | CFRP            |             |
| ●=Optimal    ○=Secondary |                 |             |

Series

1061

Tool material

HSS-E-PM

Coating

TiCN

Standard

DIN 371/376

Spiral Point

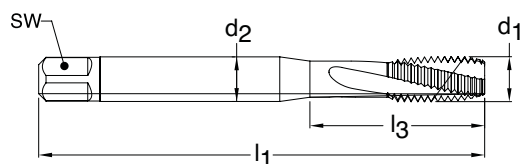
15° Helix

Chamfer Form

C • 2-3

Class of Fit

4HX



| d1 - P     | D limits | Tap drill range mm | No. of Flutes | d2<br>mm | SW<br>mm | l1<br>mm | l3<br>mm | Code no. | EDP Number    |
|------------|----------|--------------------|---------------|----------|----------|----------|----------|----------|---------------|
| M3 X 0.50  | D1/D2    | 2.513 - 2.653      | 3             | 3.50     | 2.70     | 56.00    | 18.00    | 3.000    | 9010610030000 |
| M4 X 0.70  | D2/D3    | 3.318 - 3.498      | 3             | 4.50     | 3.40     | 63.00    | 21.00    | 4.000    | 9010610040000 |
| M5 X 0.80  | D2/D3    | 4.221 - 4.421      | 3             | 6.00     | 4.90     | 70.00    | 25.00    | 5.000    | 9010610050000 |
| M6 X 1.00  | D3/D4    | 5.026 - 5.216      | 3             | 6.00     | 4.90     | 80.00    | 30.00    | 6.000    | 9010610060000 |
| M8 X 1.25  | D3/D4    | 6.782 - 6.994      | 3             | 8.00     | 6.20     | 90.00    | 35.00    | 8.000    | 9010610080000 |
| M10 X 1.50 | D3/D4    | 8.539 - 8.775      | 3             | 10.00    | 8.00     | 100.00   | 39.00    | 10.000   | 9010610100000 |
| M12 X 1.75 | D4/D5    | 10.295 - 10.560    | 4             | 9.00     | 7.00     | 110.00   | N/A      | 12.000   | 9010610120000 |
| M16 X 2.00 | D5/D6    | 14.051 - 14.351    | 4             | 12.00    | 9.00     | 110.00   | N/A      | 16.000   | 9010610160000 |

| Material group         | Approximate Rc | Approximate HB | Recommended SFM |             |               |             |               |             |
|------------------------|----------------|----------------|-----------------|-------------|---------------|-------------|---------------|-------------|
|                        |                |                | HSS-E           |             | HSS-E-PM      |             | Solid carbide |             |
|                        |                |                | bright finish   | hard coated | bright finish | hard coated | bright finish | hard coated |
| Titanium and Ti-alloys | —              | 140-275        | —               | —           | —             | 20-30       | —             | —           |
|                        | —              | 300-380        | —               | —           | —             | 10-18       | —             | —           |
| Nickel and Ni-alloys   | —              | 200-300        | —               | —           | —             | 10-18       | —             | —           |
|                        | —              | >300           | —               | —           | —             | 6-12        | —             | —           |

**MJ blind hole tap**

for NI and NI Alloys

| Material                 |                 | Suitability |
|--------------------------|-----------------|-------------|
| <b>P</b>                 | Steel           |             |
| <b>M</b>                 | Stainless steel |             |
| <b>K</b>                 | Cast iron       |             |
| <b>N</b>                 | Aluminum        |             |
| <b>S</b>                 | Ni / Ti alloys  | ●           |
| <b>H</b>                 | Hardened steel  |             |
|                          | CFRP            |             |
| ●=Optimal    ○=Secondary |                 |             |

Series

1065

Tool material

HSS-E-PM

Coating

TiAlN

Standard

DIN 371/376

Spiral Point

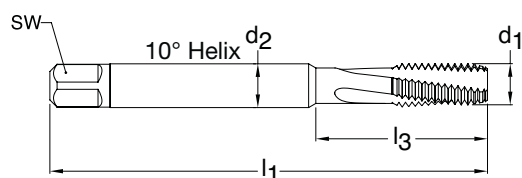
10° Helix

Chamfer Form

C • 2-3

Class of Fit

4HX



| d1 - P     | D limits | Tap drill range mm | No. of Flutes | d2<br>mm | SW<br>mm | l1<br>mm | l3<br>mm | Code no. | EDP Number    |
|------------|----------|--------------------|---------------|----------|----------|----------|----------|----------|---------------|
| M3 X 0.50  | D1/D2    | 2.513 - 2.653      | 3             | 3.50     | 2.70     | 56.00    | 18.00    | 3.000    | 9010650030000 |
| M4 X 0.70  | D2/D3    | 3.318 - 3.498      | 3             | 4.50     | 3.40     | 63.00    | 21.00    | 4.000    | 9010650040000 |
| M5 X 0.80  | D2/D3    | 4.221 - 4.421      | 3             | 6.00     | 4.90     | 70.00    | 25.00    | 5.000    | 9010650050000 |
| M6 X 1.00  | D3/D4    | 5.026 - 5.216      | 3             | 6.00     | 4.90     | 80.00    | 30.00    | 6.000    | 9010650060000 |
| M8 X 1.25  | D3/D4    | 6.782 - 6.994      | 3             | 8.00     | 6.20     | 90.00    | 35.00    | 8.000    | 9010650080000 |
| M10 X 1.50 | D3/D4    | 8.539 - 8.775      | 3             | 10.00    | 8.00     | 100.00   | 39.00    | 10.000   | 9010650100000 |
| M12 X 1.75 | D4/D5    | 10.295 - 10.560    | 4             | 9.00     | 7.00     | 110.00   | N/A      | 12.000   | 9010650120000 |
| M16 X 2.00 | D5/D6    | 14.051 - 14.351    | 4             | 12.00    | 9.00     | 110.00   | N/A      | 16.000   | 9010650160000 |

| Material group         | Approximate Rc | Approximate HB | Recommended SFM |             |               |             |               |             |
|------------------------|----------------|----------------|-----------------|-------------|---------------|-------------|---------------|-------------|
|                        |                |                | HSS-E           |             | HSS-E-PM      |             | Solid carbide |             |
|                        |                |                | bright finish   | hard coated | bright finish | hard coated | bright finish | hard coated |
| Titanium and Ti-alloys | —              | 140-275        | —               | —           | —             | 20-30       | —             | —           |
|                        | —              | 300-380        | —               | —           | —             | 10-18       | —             | —           |
| Nickel and Ni-alloys   | —              | 200-300        | —               | —           | —             | 10-18       | —             | —           |
|                        | —              | >300           | —               | —           | —             | 6-12        | —             | —           |

**MJF through hole tap**

for Ti/Ni and Ti/Ni Alloys

| Material                 |                 | Suitability |
|--------------------------|-----------------|-------------|
| <b>P</b>                 | Steel           |             |
| <b>M</b>                 | Stainless steel |             |
| <b>K</b>                 | Cast iron       |             |
| <b>N</b>                 | Aluminum        |             |
| <b>S</b>                 | Ni / Ti alloys  | ●           |
| <b>H</b>                 | Hardened steel  |             |
|                          | CFRP            |             |
| ●=Optimal    ○=Secondary |                 |             |

Series

1058

Tool material

**HSS-E-PM**

Coating

TiCN

Standard

DIN 371

Spiral Point

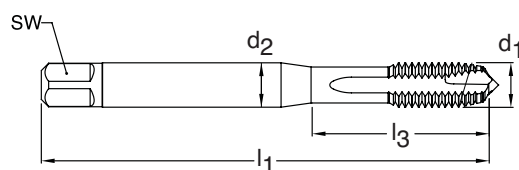
Straight flute

Chamfer Form

B • 3.5-5

Class of Fit

4HX



| d1 - P     | D limits | Tap drill range mm | No. of Flutes | d2<br>mm | SW<br>mm | l1<br>mm | l3<br>mm | Code no. | EDP Number    |
|------------|----------|--------------------|---------------|----------|----------|----------|----------|----------|---------------|
| M6 X 0.50  | D2/D3    | 5.513 - 5.625      | 3             | 6.00     | 4.90     | 80.00    | 30.00    | 6.003    | 9010580060030 |
| M6 X 0.75  | D2/D3    | 5.269 - 5.419      | 3             | 6.00     | 4.90     | 80.00    | 30.00    | 6.004    | 9010580060040 |
| M8 X 1.00  | D3/D4    | 7.026 - 7.216      | 4             | 8.00     | 6.20     | 90.00    | 35.00    | 8.005    | 9010580080050 |
| M10 X 1.00 | D3/D4    | 9.026 - 9.216      | 4             | 10.00    | 8.00     | 90.00    | 35.00    | 10.005   | 9010580100050 |
| M10 X 1.25 | D3/D4    | 8.782 - 8.994      | 4             | 10.00    | 8.00     | 100.00   | 39.00    | 10.006   | 9010580100060 |

| Material group         | Approximate Rc | Approximate HB | Recommended SFM |             |               |             |               |             |
|------------------------|----------------|----------------|-----------------|-------------|---------------|-------------|---------------|-------------|
|                        |                |                | HSS-E           |             | HSS-E-PM      |             | Solid carbide |             |
|                        |                |                | bright finish   | hard coated | bright finish | hard coated | bright finish | hard coated |
| Titanium and Ti-alloys | —              | 140-275        | —               | —           | —             | 20-30       | —             | —           |
|                        | —              | 300-380        | —               | —           | —             | 10-18       | —             | —           |
| Nickel and Ni-alloys   | —              | 200-300        | —               | —           | —             | 10-18       | —             | —           |
|                        | —              | >300           | —               | —           | —             | 6-12        | —             | —           |

**MJF blind hole tap**

for Ti and Ti Alloys

| Material                 |                 | Suitability |
|--------------------------|-----------------|-------------|
| <b>P</b>                 | Steel           |             |
| <b>M</b>                 | Stainless steel |             |
| <b>K</b>                 | Cast iron       |             |
| <b>N</b>                 | Aluminum        |             |
| <b>S</b>                 | Ni / Ti alloys  | ●           |
| <b>H</b>                 | Hardened steel  |             |
|                          | CFRP            |             |
| ●=Optimal    ○=Secondary |                 |             |

Series

**1062**

Tool material

**HSS-E-PM**

Coating

TiCN

Standard

DIN 371

Spiral Point

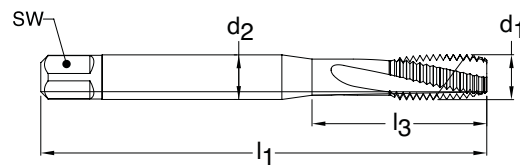
15° Helix

Chamfer Form

C • 2-3

Class of Fit

4HX



| d1 - P     | D limits | Tap drill range mm | No. of Flutes | d2<br>mm | SW<br>mm | l1<br>mm | l3<br>mm | Code no. | EDP Number    |
|------------|----------|--------------------|---------------|----------|----------|----------|----------|----------|---------------|
| M6 X 0.50  | D2/D3    | 5.513 - 5.625      | 3             | 6.00     | 4.90     | 80.00    | 30.00    | 6.003    | 9010620060030 |
| M6 X 0.75  | D2/D3    | 5.269 - 5.419      | 3             | 6.00     | 4.90     | 80.00    | 30.00    | 6.004    | 9010620060040 |
| M8 X 0.75  | D2/D3    | 7.269 - 7.419      | 3             | 8.00     | 6.20     | 80.00    | 30.00    | 8.004    | 9010620080040 |
| M8 X 1.00  | D3/D4    | 7.026 - 7.216      | 3             | 8.00     | 6.20     | 90.00    | 35.00    | 8.005    | 9010620080050 |
| M10 X 1.00 | D3/D4    | 9.026 - 9.216      | 3             | 10.00    | 8.00     | 90.00    | 35.00    | 10.005   | 9010620100050 |
| M10 X 1.25 | D3/D4    | 8.782 - 8.994      | 3             | 10.00    | 8.00     | 100.00   | 39.00    | 10.006   | 9010620100060 |

| Material group         | Approximate Rc | Approximate HB | Recommended SFM |             |               |             |               |             |
|------------------------|----------------|----------------|-----------------|-------------|---------------|-------------|---------------|-------------|
|                        |                |                | HSS-E           |             | HSS-E-PM      |             | Solid carbide |             |
|                        |                |                | bright finish   | hard coated | bright finish | hard coated | bright finish | hard coated |
| Titanium and Ti-alloys | —              | 140-275        | —               | —           | —             | 20-30       | —             | —           |
|                        | —              | 300-380        | —               | —           | —             | 10-18       | —             | —           |
| Nickel and Ni-alloys   | —              | 200-300        | —               | —           | —             | 10-18       | —             | —           |
|                        | —              | >300           | —               | —           | —             | 6-12        | —             | —           |

**MJF blind hole tap**

for NI and NI Alloys

| Material                 |                 | Suitability |
|--------------------------|-----------------|-------------|
| <b>P</b>                 | Steel           |             |
| <b>M</b>                 | Stainless steel |             |
| <b>K</b>                 | Cast iron       |             |
| <b>N</b>                 | Aluminum        |             |
| <b>S</b>                 | Ni / Ti alloys  | ●           |
| <b>H</b>                 | Hardened steel  |             |
|                          | CFRP            |             |
| ●=Optimal    ○=Secondary |                 |             |

Series

1066

Tool material

HSS-E-PM

Coating

TiAlN

Standard

DIN 371

Spiral Point

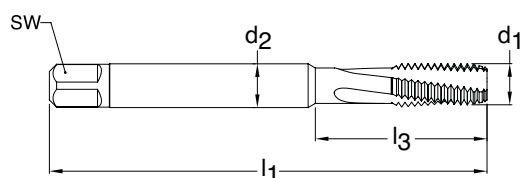
10° Helix

Chamfer Form

C • 2-3

Class of Fit

4HX



| d1 - P     | D limits | Tap drill range mm | No. of Flutes | d2 mm | SW mm | l1 mm  | l3 mm | Code no. | EDP Number    |
|------------|----------|--------------------|---------------|-------|-------|--------|-------|----------|---------------|
| M6 X 0.50  | D2/D3    | 5.513 - 5.625      | 3             | 6.00  | 4.90  | 80.00  | 30.00 | 6.003    | 9010660060030 |
| M6 X 0.75  | D2/D3    | 5.269 - 5.419      | 3             | 6.00  | 4.90  | 80.00  | 30.00 | 6.004    | 9010660060040 |
| M8 X 0.50  | D2/D3    | 7.513 - 7.625      | 3             | 8.00  | 6.20  | 80.00  | 30.00 | 8.003    | 9010660080030 |
| M8 X 0.75  | D2/D3    | 7.269 - 7.419      | 3             | 8.00  | 6.20  | 80.00  | 30.00 | 8.004    | 9010660080040 |
| M8 X 1.00  | D3/D4    | 7.026 - 7.216      | 3             | 8.00  | 6.20  | 90.00  | 35.00 | 8.005    | 9010660080050 |
| M10 X 1.00 | D3/D4    | 9.026 - 9.216      | 3             | 10.00 | 8.00  | 90.00  | 35.00 | 10.005   | 9010660100050 |
| M10 X 1.25 | D3/D4    | 8.782 - 8.994      | 3             | 10.00 | 8.00  | 100.00 | 39.00 | 10.006   | 9010660100060 |
|            |          |                    |               |       |       |        |       |          |               |
|            |          |                    |               |       |       |        |       |          |               |
|            |          |                    |               |       |       |        |       |          |               |
|            |          |                    |               |       |       |        |       |          |               |
|            |          |                    |               |       |       |        |       |          |               |
|            |          |                    |               |       |       |        |       |          |               |

| Material group         | Approximate Rc | Approximate HB | Recommended SFM |             |               |             |               |             |
|------------------------|----------------|----------------|-----------------|-------------|---------------|-------------|---------------|-------------|
|                        |                |                | HSS-E           |             | HSS-E-PM      |             | Solid carbide |             |
|                        |                |                | bright finish   | hard coated | bright finish | hard coated | bright finish | hard coated |
| Titanium and Ti-alloys | —              | 140-275        | —               | —           | —             | 20-30       | —             | —           |
|                        | —              | 300-380        | —               | —           | —             | 10-18       | —             | —           |
| Nickel and Ni-alloys   | —              | 200-300        | —               | —           | —             | 10-18       | —             | —           |
|                        | —              | >300           | —               | —           | —             | 6-12        | —             | —           |





## Micro-thread milling cutters

Series

4215



Tool material

Solid Carbide

Coating

TiCN

Shank

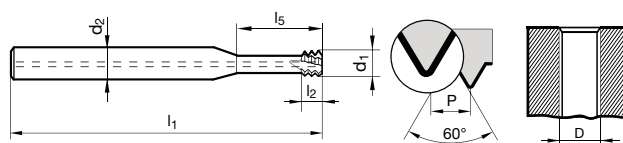


Type

MTM3 SP

| Material              |                 | Suitability |
|-----------------------|-----------------|-------------|
| <b>P</b>              | Steel           | ●           |
| <b>M</b>              | Stainless steel | ●           |
| <b>K</b>              | Cast iron       | ●           |
| <b>N</b>              | Aluminum        | ●           |
| <b>S</b>              | Ni / Ti alloys  | ●           |
| <b>H</b>              | Hardened steel  | ●           |
|                       | CFRP            |             |
| ●=Optimal ○=Secondary |                 |             |

with internal coolant ≥ UNJF 1/4



| D                       | P   | d1   | d2    | l1    | l2   | l5    | Z | Code no. | EDP Number    |
|-------------------------|-----|------|-------|-------|------|-------|---|----------|---------------|
|                         | TPI | mm   | mm    | mm    | mm   | mm    |   |          |               |
| UNJC No 6               | 32  | 2.70 | 6.00  | 58.00 | 2.40 | 11.00 | 4 | 3.505    | 9042150035050 |
| UNJC No 8 + UNJC No 10  | 32  | 3.30 | 6.00  | 58.00 | 2.40 | 14.00 | 4 | 4.166    | 9042150041660 |
| UNJC No 10 + UNJC No 12 | 24  | 3.70 | 6.00  | 58.00 | 3.20 | 15.00 | 4 | 4.826    | 9042150048260 |
| UNJF 1/4                | 28  | 5.10 | 8.00  | 64.00 | 2.70 | 19.50 | 4 | 6.349    | 9042150063490 |
| UNJC 1/4                | 20  | 4.90 | 6.00  | 58.00 | 3.80 | 19.50 | 4 | 6.350    | 9042150063500 |
| UNJF 5/16 + UNJF 3/8    | 24  | 6.70 | 8.00  | 64.00 | 3.20 | 24.00 | 4 | 7.937    | 9042150079370 |
| UNJC 5/16 + UNJF 9/16   | 18  | 6.15 | 8.00  | 64.00 | 4.20 | 24.00 | 4 | 7.938    | 9042150079380 |
| UNJC 3/8 + UNJF 3/4     | 16  | 6.90 | 8.00  | 64.00 | 4.80 | 26.00 | 4 | 9.525    | 9042150095250 |
| UNJF 7/16               | 20  | 8.00 | 10.00 | 73.00 | 3.80 | 30.00 | 4 | 11.112   | 9042150111120 |
| UNJC 7/16 + UNJF 7/8    | 14  | 7.90 | 10.00 | 73.00 | 5.40 | 30.00 | 4 | 11.113   | 9042150111130 |
| UNJC 1/2                | 13  | 9.40 | 10.00 | 73.00 | 5.90 | 30.00 | 4 | 12.700   | 9042150127000 |

## 3xD



| Material |                 | Suitability |
|----------|-----------------|-------------|
| <b>P</b> | Steel           | ●           |
| <b>M</b> | Stainless steel | ●           |
| <b>K</b> | Cast iron       | ●           |
| <b>N</b> | Aluminum        | ●           |
| <b>S</b> | Ni / Ti alloys  | ●           |
| <b>H</b> | Hardened steel  | ●           |
|          | CFRP            |             |

●=Optimal    ○=Secondary



**GUHRING** 37



# Application recommendations thread milling cutters and micro-thread milling cutters



| ISO      |           | Material group                                                                  | Hardness HRC          | Hardness Brinell |  |
|----------|-----------|---------------------------------------------------------------------------------|-----------------------|------------------|--|
| <b>P</b> | <b>P1</b> | Structural/free-cutting steels, Unalloyed heat-treatable-/ case hardened steels | < 22                  | < 220            |  |
|          | <b>P2</b> | Free-cutting steels, Unalloyed case hardened steels, nitriding steels           | < 30                  | < 290            |  |
|          | <b>P3</b> | Alloyed heat-treatable steels, heat-treatable steels, high speed steels         | < 38                  | < 350            |  |
| <b>M</b> | <b>M1</b> | Stainless steel sulfured, austenitic                                            | < 30                  | < 290            |  |
|          | <b>M2</b> | Stainless and acid-resit. steel steels, martensitic                             | < 30                  | < 290            |  |
|          | <b>M3</b> | duplex and super duplex                                                         | < 40                  | < 375            |  |
| <b>K</b> | <b>K1</b> | cast iron                                                                       |                       | < 300            |  |
|          | <b>K2</b> | Spher. graph. iron and mall. cast iron                                          |                       | < 350            |  |
|          | <b>K3</b> | ADI, GGV                                                                        |                       | < 350            |  |
| <b>N</b> | <b>N1</b> | Aluminium and wrought alloys                                                    |                       | < 150            |  |
|          | <b>N2</b> | Aluminium- cast alloys                                                          | 6-12% silicon content | — —              |  |
|          | <b>N3</b> | Magnesium alloys                                                                |                       | < 150            |  |
|          | <b>N4</b> | Copper and copper alloys                                                        |                       | ≤ 120            |  |
|          | <b>N5</b> | Copper special alloys                                                           |                       | < 410            |  |
|          | <b>N6</b> | Plastics [ thermoplastics, duroplastics ]                                       |                       | — —              |  |
| <b>S</b> | <b>S1</b> | Titanium und titanium alloys                                                    |                       | < 350            |  |
|          | <b>S2</b> | Nickel, cobalt, iron alloys                                                     |                       | < 410            |  |
| <b>H</b> | <b>H1</b> | High tensile steels, hardened steels                                            |                       | < 55             |  |
|          | <b>H2</b> |                                                                                 |                       | < 62             |  |



|  | Cutting speed<br>SFM | Milling part diameter [ d1 ] / feed per tooth [ fz ] [ conventional milling ] |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|--|----------------------|-------------------------------------------------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|  |                      | Ø1 mm                                                                         | Ø2 mm  | Ø3 mm  | Ø4 mm  | Ø5 mm  | Ø6 mm  | Ø7 mm  | Ø8 mm  | Ø9 mm  | Ø10 mm | Ø12 mm | Ø14 mm | Ø16 mm | Ø18 mm | Ø20 mm |
|  |                      | IPT                                                                           | IPT    | IPT    | IPT    | IPT    | IPT    | IPT    | IPT    | IPT    | IPT    | IPT    | IPT    | IPT    | IPT    | IPT    |
|  | 300                  | 0.0004                                                                        | 0.0008 | 0.0008 | 0.0010 | 0.0012 | 0.0014 | 0.0018 | 0.0020 | 0.0022 | 0.0024 | 0.0024 | 0.0026 | 0.0026 | 0.0028 | 0.0031 |
|  | 260                  | 0.0004                                                                        | 0.0008 | 0.0008 | 0.0010 | 0.0012 | 0.0014 | 0.0018 | 0.0020 | 0.0022 | 0.0024 | 0.0024 | 0.0026 | 0.0026 | 0.0028 | 0.0031 |
|  | 230                  | 0.0004                                                                        | 0.0008 | 0.0008 | 0.0010 | 0.0012 | 0.0014 | 0.0018 | 0.0020 | 0.0022 | 0.0024 | 0.0024 | 0.0026 | 0.0026 | 0.0028 | 0.0031 |
|  | 180                  | 0.0004                                                                        | 0.0008 | 0.0010 | 0.0012 | 0.0012 | 0.0012 | 0.0014 | 0.0016 | 0.0020 | 0.0022 | 0.0024 | 0.0026 | 0.0026 | 0.0028 | 0.0030 |
|  | 165                  | 0.0004                                                                        | 0.0008 | 0.0010 | 0.0012 | 0.0012 | 0.0012 | 0.0014 | 0.0016 | 0.0020 | 0.0022 | 0.0024 | 0.0026 | 0.0026 | 0.0028 | 0.0030 |
|  | 150                  | 0.0004                                                                        | 0.0008 | 0.0010 | 0.0012 | 0.0012 | 0.0012 | 0.0014 | 0.0016 | 0.0020 | 0.0022 | 0.0024 | 0.0026 | 0.0026 | 0.0028 | 0.0030 |
|  | 400                  | 0.0004                                                                        | 0.0008 | 0.0010 | 0.0012 | 0.0014 | 0.0016 | 0.0018 | 0.0020 | 0.0024 | 0.0026 | 0.0028 | 0.0031 | 0.0035 | 0.0039 | 0.0047 |
|  | 330                  | 0.0004                                                                        | 0.0008 | 0.0010 | 0.0012 | 0.0014 | 0.0016 | 0.0018 | 0.0020 | 0.0024 | 0.0026 | 0.0028 | 0.0031 | 0.0035 | 0.0039 | 0.0047 |
|  | 260                  | 0.0004                                                                        | 0.0008 | 0.0010 | 0.0012 | 0.0014 | 0.0016 | 0.0018 | 0.0020 | 0.0024 | 0.0026 | 0.0028 | 0.0031 | 0.0035 | 0.0039 | 0.0047 |
|  | 820                  | 0.0008                                                                        | 0.0012 | 0.0014 | 0.0016 | 0.0018 | 0.0020 | 0.0022 | 0.0024 | 0.0026 | 0.0028 | 0.0031 | 0.0033 | 0.0035 | 0.0039 | 0.0047 |
|  | 750                  | 0.0008                                                                        | 0.0012 | 0.0014 | 0.0016 | 0.0018 | 0.0020 | 0.0022 | 0.0024 | 0.0026 | 0.0028 | 0.0031 | 0.0033 | 0.0035 | 0.0039 | 0.0047 |
|  | 600                  | 0.0008                                                                        | 0.0012 | 0.0014 | 0.0016 | 0.0018 | 0.0020 | 0.0022 | 0.0024 | 0.0026 | 0.0028 | 0.0031 | 0.0033 | 0.0035 | 0.0039 | 0.0047 |
|  | 425                  | 0.0004                                                                        | 0.0008 | 0.0010 | 0.0012 | 0.0014 | 0.0016 | 0.0018 | 0.0020 | 0.0022 | 0.0024 | 0.0026 | 0.0028 | 0.0030 | 0.0031 | 0.0035 |
|  | 525                  | 0.0004                                                                        | 0.0008 | 0.0010 | 0.0012 | 0.0014 | 0.0016 | 0.0018 | 0.0020 | 0.0022 | 0.0024 | 0.0024 | 0.0026 | 0.0028 | 0.0030 | 0.0031 |
|  | 1000                 | 0.0008                                                                        | 0.0012 | 0.0016 | 0.0018 | 0.0020 | 0.0022 | 0.0024 | 0.0028 | 0.0031 | 0.0035 | 0.0035 | 0.0039 | 0.0047 | 0.0051 | 0.0059 |
|  | 130                  | 0.0004                                                                        | 0.0004 | 0.0006 | 0.0008 | 0.0010 | 0.0012 | 0.0014 | 0.0016 | 0.0016 | 0.0018 | 0.0020 | 0.0022 | 0.0024 | 0.0026 | 0.0028 |
|  | 100                  | 0.0004                                                                        | 0.0004 | 0.0006 | 0.0008 | 0.0010 | 0.0012 | 0.0014 | 0.0016 | 0.0016 | 0.0018 | 0.0020 | 0.0022 | 0.0024 | 0.0026 | 0.0028 |
|  | 150                  | x                                                                             | 0.0004 | 0.0006 | 0.0008 | 0.0010 | 0.0012 | 0.0012 | 0.0014 | 0.0016 | 0.0018 | 0.0020 | 0.0022 | 0.0024 | 0.0026 | 0.0028 |
|  | 165                  | x                                                                             | 0.0004 | 0.0006 | 0.0008 | 0.0010 | 0.0012 | 0.0012 | 0.0014 | 0.0016 | 0.0018 | 0.0020 | 0.0022 | 0.0024 | 0.0026 | 0.0028 |



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