

TOGLON HARD SERIES

Tolerance H7 • up to 72 HRC

**HOLE TOLERANCE H7 BY DRILLING ONLY
NO REAMING NECESSARY**

FOR HARDENED STEELS 40-72 HRC


DRILLING DEPTH 5XD TO 50XD

3 FLUTE GEOMETRY

DOUBLE TIP ANGLE

ULTRA HARD AND THIN ALT-COATING

 **IWATA TOOL**



Iwata Tool, established in 1926, is a manufacturer of high-speed steel and carbide cutting tools. Situated in Nagoya, the heartland of Japan's automotive and machining industry, Iwata Tool is surrounded by many of its customers and major Japanese universities that allow Iwata Tool to combine the development demands of production with the innovation power of highest ranked technical institutes.

In its nearly 100-year history, Iwata Tool has transformed itself many times, always adapting to the new demands of the market. One of the latest developments is the TOGLON Hard® Line. TOGLON derives from the Japanese word for spiral, while HARD refers to the applications in work materials between 45 and 72 HRC. Originally designed for drilling holes for ejector pins in the mold and die industry, TOGLON Hard® drills are now used in a wide range of applications with one common requirement: drilling with H7 tolerance in hardened steel. This feature allows to finish molds, on CNC machining centers without the need to manufacture precision holes on EDM machines as done conventionally. The result is impressive! Holes that have taken hours to EDM can now be drilled in a few minutes. The setup times on the EDM machines and back to the CNC machining centers are completely eliminated. On top of this the precision of the holes is better as the work piece can be completed in one setup.

Apart from the use of highest quality micro grain carbide and the latest developments in coating technology, TOGLON Hard® tools feature a unique cutting geometry. The high spiral flute design features sharp cutting edges but only in combination with the double angle tip TOGLON Hard® drills to perform as they do.

The ability to drill directly into hardened steel with tolerance H7 is one of the outstanding properties of TOGLON Hard® drills. The second is the extreme roundness of the drilled holes. Air sealed holes can be manufactured in hardened steels within minutes without reaming. Both time and cost reduction achieved by TOGLON Hard® drills compared to conventional EDM are substantial, to the benefit of our customers.

 **IWATA TOOL**

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TOGLON HARD REAMERS

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|----------------|----------------|---------------|--------------|----------------|-----------|
|----------------|----------------|---------------|--------------|----------------|-----------|

TOGLON HARD SP

| | | | | | |
|----|------------------------------|--|----------------|----------|---|
| 06 | TOGLON HARD SP 90° MINIATURE | | TGHMSP-CBALT | 0.1~1.5 | - |
| 07 | TOGLON HARD SP 90° | | 90TGHSP-CBALD | 1.0~25.0 | - |
| 08 | TOGLON HARD SP 90° LONG | | 90LTGHSP-CBALD | 3.0~12.0 | - |
| 09 | TOGLON HARD SP 60° | | 60TGHSP-CBALD | 1.0~20.0 | - |

TOGLON HARD DRILLS

| | | | | | |
|-------|-------------------------------------|--|----------------|----------|-------------|
| 10 | TOGLON HARD DRILL MINIATURE SHORT | | TGHMDS-CBALT | 0.1~2.0 | +0 -0.01 |
| 11 | TOGLON HARD DRILL MINIATURE REGULAR | | TGHMDR-CBALT | 0.1~2.0 | +0 -0.01 |
| 12-13 | TOGLON HARD DRILL SHORT | | TGHDS-CBALD | 1.0~12.0 | +0 -0.02 |
| 14-15 | TOGLON HARD DRILL REGULAR 5D | | TGHDR-CBALT5D | 0.5~12.0 | H7 |
| 16-17 | TOGLON HARD DRILL REGULAR | | TGHDR-CBALT | 0.8~6.0 | H7 |
| 18-19 | TOGLON HARD DRILL LONG 20D | | TGHDL-CBALT20D | 0.8~6.0 | H7 |
| 20 | TOGLON HARD DRILL LONG 30D | | TGHDL-CBALT30D | 0.8~3.0 | H7 |
| 21 | TOGLON HARD DRILL LONG 50D | | TGHDL-CBALT50D | 0.8~2.0 | H7 |

TOGLON HARD REAMERS

| | | | | | |
|----|--------------------|--|------------|------------|---|
| 22 | TOGLON HARD REAMER | | TGHR-CBALT | 2.99~12.02 | - |
|----|--------------------|--|------------|------------|---|

PRODUCT INDEX

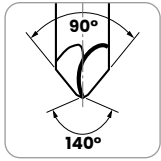
References

| Flutes | Tip Angle | Machinable Length | Coating | Alloy Steel | Heat treated Steel | Hardened Steel | Hardened Steel | Titanium Alloy | Aluminium Alloy | Zirconia Glass |
|-------------|----------------------|-------------------|----------------|-------------|--------------------|----------------|----------------|----------------|-----------------|----------------|
| | | | | SCM SCR | SKD SKS | ~45 HRC | 45~ HRC | | Al | Machinable |
| FLUTES 2 | TIP 90° 140° | - | ALT COATING | ○ | ●● | ●● | ●●● | ○ | - | ●● |
| FLUTES 3 | TIP 90° 140° | - | ALD COATING | ○ | ●● | ●● | ●●● | ○ | - | ●● |
| FLUTES 3 | TIP 90° 140° | - | ALD COATING | ○ | ●● | ●● | ●●● | ○ | - | ●● |
| FLUTES 3 | POINT 60° 140° | - | ALD COATING | ○ | ●● | ●● | ●●● | ○ | - | ●● |
| FLUTES 2 | TIP 90° 140° | 5xD | ALT COATING | - | ○ | ●●● | ●●● | ○ | - | ●● |
| FLUTES 2 | TIP 90° 140° | 10xD | ALT COATING | - | ○ | ●●● | ●●● | ○ | - | ●● |
| FLUTES 3 | TIP 90° 140° | 5xD | ALD COATING | - | ○ | ●●● | ●●● | ○ | - | ●● |
| FLUTES 3 | TIP 90° 140° | 5xD | ALT COATING | - | ○ | ●●● | ●●● | ○ | - | ●● |
| FLUTES 3 | TIP 90° 140° | 10xD | ALT COATING | - | ○ | ●●● | ●●● | ○ | - | ●● |
| FLUTES 3 | TIP 90° 140° | 20xD | ALT COATING | - | ○ | ●●● | ●●● | ○ | - | ●● |
| FLUTES 3 | TIP 90° 140° | 30xD | ALT COATING | - | ○ | ●●● | ●●● | ○ | - | ●● |
| FLUTES 3 | TIP 90° 140° | 50xD | ALT COATING | - | ○ | ●●● | ●●● | ○ | - | ●● |
| FLUTES 4 | CHAMFER 45° | - | ALT COATING | - | ○ | ●●● | ●●● | ○ | - | ●● |

Suitable Work Materials: Most Suitable [●●●] Suitable [●●] Possible [○]

TOGLON HARD SP 90°

ALD Coating



SOLID CARBIDE MATERIAL

ALD COATING

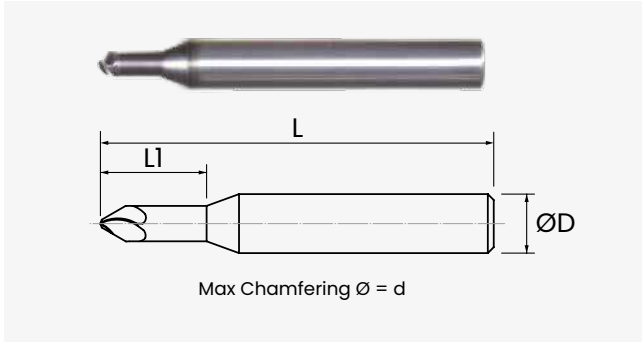
SHANK h6

FLUTES 3

TIP 90° 140°

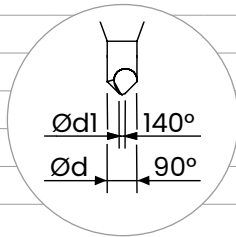


1.0~25.0



| Product Code | Ø d1 | Ø d | Ø D | L1 | L |
|------------------|------|-----|-----|-----|----|
| 90TGHSPICBALD | 0,2 | 1,0 | 3 | 3,0 | 40 |
| 90TGHSPI1.5CBALD | 0,3 | 1,5 | 3 | 4,5 | 40 |
| 90TGHSPI2CBALD | 0,4 | 2,0 | 3 | 6,0 | 40 |

| Product Code | Ø d1 | Ø d | Ø D | L1 | L |
|-----------------|------|-----|-----|----|-----|
| 90TGHSPI3CBALD | 0,6 | 3 | 3 | - | 40 |
| 90TGHSPI4CBALD | 0,8 | 4 | 4 | - | 40 |
| 90TGHSPI6CBALD | 1,2 | 6 | 6 | - | 50 |
| 90TGHSPI8CBALD | 1,6 | 8 | 8 | - | 60 |
| 90TGHSPI10CBALD | 2,0 | 10 | 10 | - | 70 |
| 90TGHSPI12CBALD | 2,4 | 12 | 12 | - | 75 |
| 90TGHSPI16CBALD | 3,0 | 16 | 16 | - | 80 |
| 90TGHSPI20CBALD | 4,0 | 20 | 20 | - | 100 |
| 90TGHSPI25CBALD | 5,0 | 25 | 25 | - | 100 |



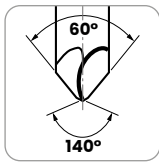
Suitable Work Materials: Most Suitable [●●●] Suitable [●●] Possible [○]

| Mild Steel | Carbon Steel | Alloy Steel | Heat treated Steel | Tool Steel | Hardened Steel | | Stainless Steel | Cast Iron | Ductile Cast Iron | Titanium Alloy | Aluminium Alloy | Copper | Plastic | Ceramics etc. | |
|------------|--------------|-------------|--------------------|------------|----------------|---------|-----------------|-----------|-------------------|----------------|-----------------|--------|---------|---------------|----------------|
| SS | S45C | SCM SCR | SKD SKS | ~40 HRC | ~45 HRC | 45~ HRC | SUS | FC | FDC | | Al | Cu | | Machinable | Zirconia Glass |
| | | ○ | ●● | | ●● | ●●● | | | | ○ | | | | ●● | |

TOGLON HARD SP 90°

TOGLON HARD SP 60°

ALD Coating



SOLID CARBIDE MATERIAL

ALD COATING

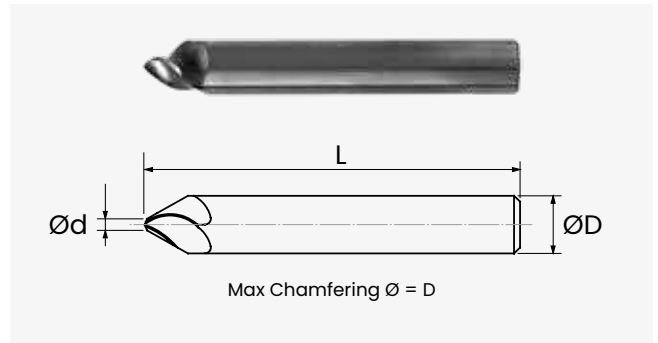
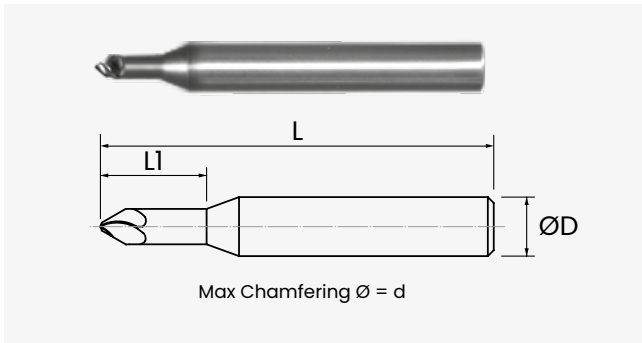
SHANK h6

FLUTES 3

POINT 60° 140°

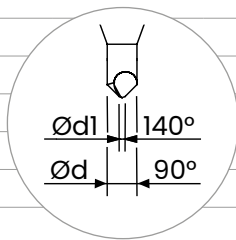


1.0~20.0



| Product Code | Ø d1 | Ø d | Ø D | L1 | L |
|-----------------|------|-----|-----|-----|----|
| 60TGHSPICBALD | 0,2 | 1,0 | 3 | 3,0 | 40 |
| 60TGHSP1.5CBALD | 0,3 | 1,5 | 3 | 4,5 | 40 |
| 60TGHSP2CBALD | 0,4 | 2,0 | 3 | 6,0 | 40 |

| Product Code | Ø d1 | Ø d | Ø D | L1 | L |
|----------------|------|-----|-----|----|-----|
| 60TGHSP3CBALD | 0,6 | 3 | 3 | - | 40 |
| 60TGHSP4CBALD | 0,8 | 4 | 4 | - | 40 |
| 60TGHSP6CBALD | 1,2 | 6 | 6 | - | 50 |
| 60TGHSP8CBALD | 1,6 | 8 | 8 | - | 60 |
| 60TGHSP10CBALD | 2,0 | 10 | 10 | - | 70 |
| 60TGHSP12CBALD | 2,4 | 12 | 12 | - | 75 |
| 60TGHSP16CBALD | 3,0 | 16 | 16 | - | 80 |
| 60TGHSP20CBALD | 4,0 | 20 | 20 | - | 100 |



Suitable Work Materials: Most Suitable [●●●] Suitable [●●] Possible [○]

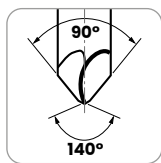
| Mild Steel | Carbon Steel | Alloy Steel | Heat treated Steel | Tool Steel | Hardened Steel | | Stainless Steel | Cast Iron | Ductile Cast Iron | Titanium Alloy | Aluminium Alloy | Copper | Plastic | Ceramics etc. | |
|------------|--------------|-------------|--------------------|------------|----------------|---------|-----------------|-----------|-------------------|----------------|-----------------|--------|---------|---------------|----------------|
| SS | S45C | SCM SCR | SKD SKS | ~40 HRC | ~45 HRC | 45~ HRC | SUS | FC | FDC | | Al | Cu | | Machinable | Zirconia Glass |
| | | ○ | ●● | | ●● | ●●● | | | | ○ | | | | ●● | |

TOGLON HARD SP 60°

TOGLON HARD DRILL SHORT

5xD • ALD Coating

IWATA TOOL



SOLID CARBIDE MATERIAL

ALD COATING

SHANK h6

FLUTES 3

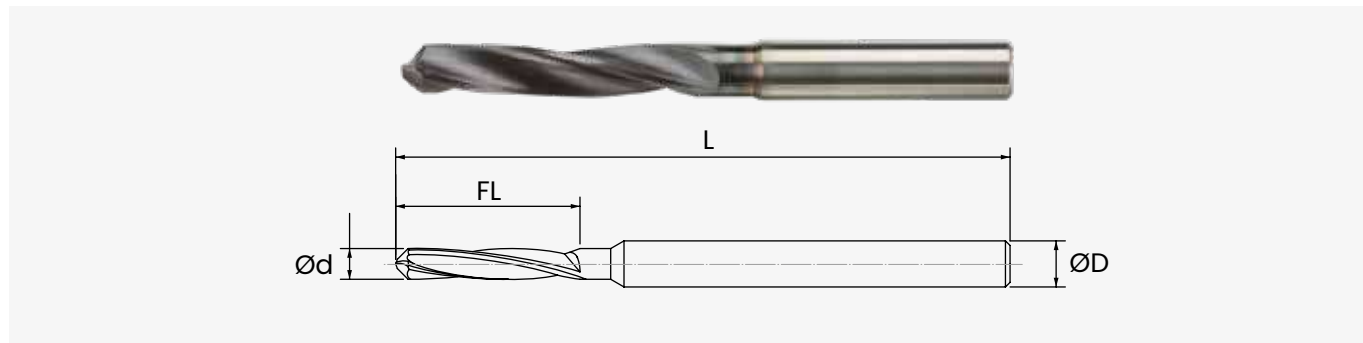
TIP 90° / 140°

5xD

R

1.0~12.0

+0 / -0.02



TOGLON HARD DRILL SHORT

| Product Code | Ø d | Ø D | FL | L |
|---------------|-----|-----|----|----|
| TGHDS1CBALD | 1,0 | 3 | 6 | 50 |
| TGHDS1.1CBALD | 1,1 | 3 | 7 | 50 |
| TGHDS1.2CBALD | 1,2 | 3 | 7 | 50 |
| TGHDS1.3CBALD | 1,3 | 3 | 8 | 50 |
| TGHDS1.4CBALD | 1,4 | 3 | 8 | 50 |
| TGHDS1.5CBALD | 1,5 | 3 | 9 | 50 |
| TGHDS1.6CBALD | 1,6 | 3 | 10 | 50 |
| TGHDS1.7CBALD | 1,7 | 3 | 10 | 50 |
| TGHDS1.8CBALD | 1,8 | 3 | 11 | 50 |
| TGHDS1.9CBALD | 1,9 | 3 | 11 | 50 |
| TGHDS2CBALD | 2,0 | 4 | 12 | 60 |
| TGHDS2.1CBALD | 2,1 | 4 | 12 | 60 |
| TGHDS2.2CBALD | 2,2 | 4 | 13 | 60 |
| TGHDS2.3CBALD | 2,3 | 4 | 13 | 60 |
| TGHDS2.4CBALD | 2,4 | 4 | 14 | 60 |
| TGHDS2.5CBALD | 2,5 | 4 | 14 | 60 |
| TGHDS2.6CBALD | 2,6 | 4 | 14 | 60 |
| TGHDS2.7CBALD | 2,7 | 4 | 16 | 60 |
| TGHDS2.8CBALD | 2,8 | 4 | 16 | 60 |
| TGHDS2.9CBALD | 2,9 | 4 | 16 | 60 |

| Product Code | Ø d | Ø D | FL | L |
|---------------|-----|-----|----|----|
| TGHDS3CBALD | 3,0 | 4 | 16 | 60 |
| TGHDS3.1CBALD | 3,1 | 4 | 18 | 60 |
| TGHDS3.2CBALD | 3,2 | 4 | 18 | 60 |
| TGHDS3.3CBALD | 3,3 | 4 | 18 | 60 |
| TGHDS3.4CBALD | 3,4 | 4 | 20 | 60 |
| TGHDS3.5CBALD | 3,5 | 4 | 20 | 60 |
| TGHDS3.6CBALD | 3,6 | 4 | 21 | 60 |
| TGHDS3.7CBALD | 3,7 | 4 | 21 | 60 |
| TGHDS3.8CBALD | 3,8 | 4 | 22 | 60 |
| TGHDS3.9CBALD | 3,9 | 4 | 22 | 60 |
| TGHDS4CBALD | 4,0 | 4 | 22 | 60 |
| TGHDS4.1CBALD | 4,1 | 6 | 24 | 60 |
| TGHDS4.2CBALD | 4,2 | 6 | 24 | 60 |
| TGHDS4.3CBALD | 4,3 | 6 | 24 | 60 |
| TGHDS4.4CBALD | 4,4 | 6 | 24 | 60 |
| TGHDS4.5CBALD | 4,5 | 6 | 24 | 60 |
| TGHDS4.6CBALD | 4,6 | 6 | 25 | 60 |
| TGHDS4.7CBALD | 4,7 | 6 | 25 | 60 |
| TGHDS4.8CBALD | 4,8 | 6 | 25 | 60 |
| TGHDS4.9CBALD | 4,9 | 6 | 25 | 60 |

Continue >>

Suitable Work Materials: Most Suitable [●●●] Suitable [●●] Possible [○]

| Mild Steel | Carbon Steel | Alloy Steel | Heat treated Steel | Tool Steel | Hardened Steel | | Stainless Steel | Cast Iron | Ductile Cast Iron | Titanium Alloy | Aluminium Alloy | Copper | Plastic | Ceramics etc. | |
|------------|--------------|-------------|--------------------|------------|----------------|---------|-----------------|-----------|-------------------|----------------|-----------------|--------|---------|---------------|----------------|
| SS | S45C | SCM SCR | SKD SKS | ~40 HRC | ~45 HRC | 45~ HRC | SUS | FC | FDC | | Al | Cu | | Machinable | Zirconia Glass |
| | | | ○ | | ●●● | ●●● | | | | ○ | | | | ●● | |

TOGLON HARD DRILL SHORT

5xD • ALD Coating

 IWATA TOOL

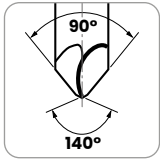
| Product Code | Ø d | Ø D | FL | L |
|---------------|-----|-----|----|----|
| TGHDS5CBALD | 5,0 | 6 | 26 | 60 |
| TGHDS5.1CBALD | 5,1 | 6 | 26 | 60 |
| TGHDS5.2CBALD | 5,2 | 6 | 26 | 60 |
| TGHDS5.3CBALD | 5,3 | 6 | 26 | 60 |
| TGHDS5.4CBALD | 5,4 | 6 | 26 | 60 |
| TGHDS5.5CBALD | 5,5 | 6 | 28 | 60 |
| TGHDS5.6CBALD | 5,6 | 6 | 28 | 60 |
| TGHDS5.7CBALD | 5,7 | 6 | 28 | 60 |
| TGHDS5.8CBALD | 5,8 | 6 | 28 | 60 |
| TGHDS5.9CBALD | 5,9 | 6 | 28 | 60 |
| TGHDS6CBALD | 6,0 | 6 | 28 | 60 |
| TGHDS6.1CBALD | 6,1 | 8 | 31 | 80 |
| TGHDS6.2CBALD | 6,2 | 8 | 31 | 80 |
| TGHDS6.5CBALD | 6,5 | 8 | 31 | 80 |
| TGHDS6.8CBALD | 6,8 | 8 | 34 | 80 |
| TGHDS6.9CBALD | 6,9 | 8 | 34 | 80 |
| TGHDS7CBALD | 7,0 | 8 | 34 | 80 |
| TGHDS7.5CBALD | 7,5 | 8 | 34 | 80 |
| TGHDS7.8CBALD | 7,8 | 8 | 37 | 80 |
| TGHDS7.9CBALD | 7,9 | 8 | 37 | 80 |

| Product Code | Ø d | Ø D | FL | L |
|----------------|------|-----|----|-----|
| TGHDS8CBALD | 8,0 | 8 | 37 | 80 |
| TGHDS8.5CBALD | 8,5 | 10 | 37 | 100 |
| TGHDS8.6CBALD | 8,6 | 10 | 40 | 100 |
| TGHDS8.7CBALD | 8,7 | 10 | 40 | 100 |
| TGHDS8.8CBALD | 8,8 | 10 | 40 | 100 |
| TGHDS9CBALD | 9 | 10 | 40 | 100 |
| TGHDS9.5CBALD | 9,5 | 10 | 40 | 100 |
| TGHDS9.6CBALD | 9,6 | 10 | 43 | 100 |
| TGHDS9.7CBALD | 9,7 | 10 | 43 | 100 |
| TGHDS9.8CBALD | 9,8 | 10 | 43 | 100 |
| TGHDS10CBALD | 10 | 10 | 43 | 100 |
| TGHDS10.3CBALD | 10,3 | 12 | 43 | 110 |
| TGHDS10.4CBALD | 10,4 | 12 | 43 | 110 |
| TGHDS10.5CBALD | 10,5 | 12 | 43 | 110 |
| TGHDS10.8CBALD | 10,8 | 12 | 47 | 110 |
| TGHDS11CBALD | 11 | 12 | 47 | 110 |
| TGHDS11.5CBALD | 11,5 | 12 | 47 | 110 |
| TGHDS11.8CBALD | 11,8 | 12 | 47 | 110 |
| TGHDS12CBALD | 12 | 12 | 51 | 110 |

TOGLON HARD DRILL REGULAR 5D

5xD • Tolerance H7 • ALT Coating

IWATA TOOL



SOLID CARBIDE MATERIAL

ALT COATING

SHANK h6

FLUTES 3

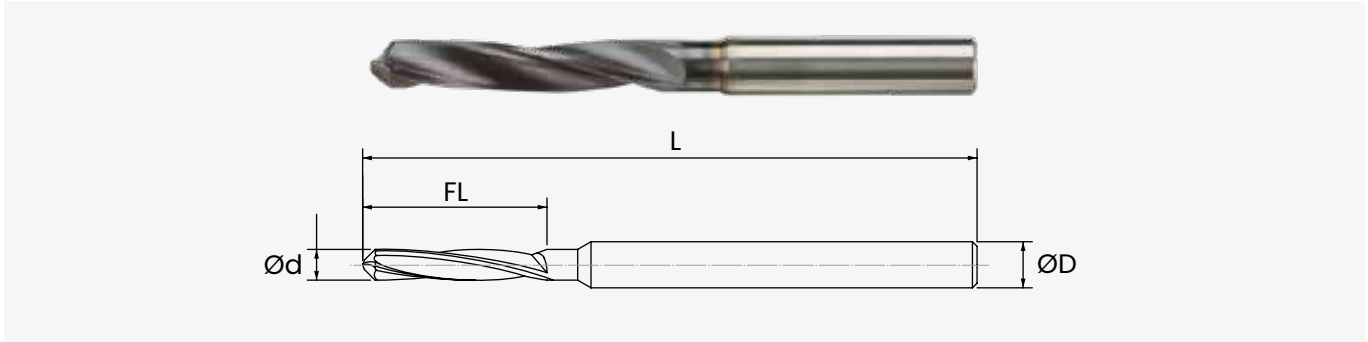
TIP 90° 140°

5xD

R

0.5~12.0

H7



TOGLON HARD DRILL REGULAR 5D

| Product Code | Ø d | Ø D | FL | L |
|-----------------|-----|-----|------|----|
| TGHDR0.5CBALT5D | 0,5 | 3 | 3,0 | 40 |
| TGHDR0.6CBALT5D | 0,6 | 3 | 3,6 | 40 |
| TGHDR0.7CBALT5D | 0,7 | 3 | 4,2 | 40 |
| TGHDR0.8CBALT5D | 0,8 | 3 | 4,8 | 40 |
| TGHDR0.9CBALT5D | 0,9 | 3 | 5,4 | 40 |
| TGHDR1.0CBALT5D | 1,0 | 3 | 6,0 | 50 |
| TGHDR1.1CBALT5D | 1,1 | 3 | 6,6 | 50 |
| TGHDR1.2CBALT5D | 1,2 | 3 | 7,2 | 50 |
| TGHDR1.3CBALT5D | 1,3 | 3 | 7,8 | 50 |
| TGHDR1.4CBALT5D | 1,4 | 3 | 8,4 | 50 |
| TGHDR1.5CBALT5D | 1,5 | 3 | 9,0 | 50 |
| TGHDR1.6CBALT5D | 1,6 | 3 | 9,6 | 50 |
| TGHDR1.7CBALT5D | 1,7 | 3 | 10,2 | 50 |
| TGHDR1.8CBALT5D | 1,8 | 3 | 10,8 | 50 |
| TGHDR1.9CBALT5D | 1,9 | 3 | 11,4 | 50 |
| TGHDR2.0CBALT5D | 2,0 | 3 | 12,0 | 50 |
| TGHDR2.1CBALT5D | 2,1 | 4 | 12,6 | 60 |
| TGHDR2.2CBALT5D | 2,2 | 4 | 13,2 | 60 |
| TGHDR2.3CBALT5D | 2,3 | 4 | 13,8 | 60 |
| TGHDR2.4CBALT5D | 2,4 | 4 | 14,4 | 60 |

| Product Code | Ø d | Ø D | FL | L |
|-----------------|-----|-----|------|----|
| TGHDR2.5CBALT5D | 2,5 | 4 | 15,0 | 60 |
| TGHDR2.6CBALT5D | 2,6 | 4 | 15,6 | 60 |
| TGHDR2.7CBALT5D | 2,7 | 4 | 16,2 | 60 |
| TGHDR2.8CBALT5D | 2,8 | 4 | 16,8 | 60 |
| TGHDR2.9CBALT5D | 2,9 | 4 | 17,4 | 60 |
| TGHDR3.0CBALT5D | 3,0 | 4 | 18,0 | 60 |
| TGHDR3.1CBALT5D | 3,1 | 4 | 18,6 | 60 |
| TGHDR3.2CBALT5D | 3,2 | 4 | 19,2 | 60 |
| TGHDR3.3CBALT5D | 3,3 | 4 | 19,8 | 60 |
| TGHDR3.4CBALT5D | 3,4 | 4 | 20,4 | 60 |
| TGHDR3.5CBALT5D | 3,5 | 4 | 21,0 | 60 |
| TGHDR3.6CBALT5D | 3,6 | 6 | 21,6 | 80 |
| TGHDR3.7CBALT5D | 3,7 | 6 | 22,2 | 80 |
| TGHDR3.8CBALT5D | 3,8 | 6 | 22,8 | 80 |
| TGHDR3.9CBALT5D | 3,9 | 6 | 23,4 | 80 |
| TGHDR4.0CBALT5D | 4,0 | 6 | 24,0 | 80 |
| TGHDR4.1CBALT5D | 4,1 | 6 | 24,6 | 80 |
| TGHDR4.2CBALT5D | 4,2 | 6 | 25,2 | 80 |
| TGHDR4.3CBALT5D | 4,3 | 6 | 25,8 | 80 |
| TGHDR4.4CBALT5D | 4,4 | 6 | 26,4 | 80 |

Continue >>

Suitable Work Materials: Most Suitable [●●●] Suitable [●●] Possible [○]

| Mild Steel | Carbon Steel | Alloy Steel | Heat treated Steel | Tool Steel | Hardened Steel | | Stainless Steel | Cast Iron | Ductile Cast Iron | Titanium Alloy | Aluminium Alloy | Copper | Plastic | Ceramics etc. | |
|------------|--------------|-------------|--------------------|------------|----------------|---------|-----------------|-----------|-------------------|----------------|-----------------|--------|---------|---------------|----------------|
| SS | S45C | SCM SCR | SKD SKS | ~40 HRC | ~45 HRC | 45~ HRC | SUS | FC | FDC | | Al | Cu | | Machinable | Zirconia Glass |
| | | | ○ | | ●●● | ●●● | | | | ○ | | | | ●● | |

TOGLON HARD DRILL REGULAR 5D

5xD • Tolerance H7 • ALT Coating



| Product Code | Ø d | Ø D | FL | L |
|-----------------|-----|-----|------|-----|
| TGHDR4.5CBALT5D | 4,5 | 6 | 27,0 | 80 |
| TGHDR4.6CBALT5D | 4,6 | 6 | 27,6 | 80 |
| TGHDR4.7CBALT5D | 4,7 | 6 | 28,2 | 80 |
| TGHDR4.8CBALT5D | 4,8 | 6 | 28,8 | 80 |
| TGHDR4.9CBALT5D | 4,9 | 6 | 29,4 | 80 |
| TGHDR5CBALT5D | 5,0 | 6 | 30,0 | 80 |
| TGHDR5.1CBALT5D | 5,1 | 6 | 30,6 | 80 |
| TGHDR5.2CBALT5D | 5,2 | 6 | 31,2 | 80 |
| TGHDR5.3CBALT5D | 5,3 | 6 | 31,8 | 80 |
| TGHDR5.4CBALT5D | 5,4 | 6 | 32,4 | 80 |
| TGHDR5.5CBALT5D | 5,5 | 6 | 33,0 | 80 |
| TGHDR5.6CBALT5D | 5,6 | 8 | 33,6 | 100 |
| TGHDR5.7CBALT5D | 5,7 | 8 | 34,2 | 100 |
| TGHDR5.8CBALT5D | 5,8 | 8 | 34,8 | 100 |
| TGHDR5.9CBALT5D | 5,9 | 8 | 35,4 | 100 |
| TGHDR6CBALT5D | 6,0 | 8 | 36,0 | 100 |
| TGHDR6.1CBALT5D | 6,1 | 8 | 36,6 | 100 |
| TGHDR6.2CBALT5D | 6,2 | 8 | 37,2 | 100 |
| TGHDR6.3CBALT5D | 6,3 | 8 | 37,8 | 100 |
| TGHDR6.4CBALT5D | 6,4 | 8 | 38,4 | 100 |
| TGHDR6.5CBALT5D | 6,5 | 8 | 39,0 | 100 |
| TGHDR6.6CBALT5D | 6,6 | 8 | 39,6 | 100 |
| TGHDR6.7CBALT5D | 6,7 | 8 | 40,2 | 100 |
| TGHDR6.8CBALT5D | 6,8 | 8 | 40,8 | 100 |
| TGHDR6.9CBALT5D | 6,9 | 8 | 41,4 | 100 |
| TGHDR7CBALT5D | 7,0 | 8 | 42,0 | 100 |
| TGHDR7.1CBALT5D | 7,1 | 8 | 42,6 | 100 |
| TGHDR7.2CBALT5D | 7,2 | 8 | 43,2 | 100 |
| TGHDR7.3CBALT5D | 7,3 | 8 | 43,8 | 100 |
| TGHDR7.4CBALT5D | 7,4 | 8 | 44,4 | 100 |
| TGHDR7.5CBALT5D | 7,5 | 8 | 45,0 | 100 |
| TGHDR7.6CBALT5D | 7,6 | 8 | 45,6 | 100 |
| TGHDR7.7CBALT5D | 7,7 | 10 | 46,2 | 110 |
| TGHDR7.8CBALT5D | 7,8 | 10 | 46,8 | 110 |
| TGHDR7.9CBALT5D | 7,9 | 10 | 47,4 | 110 |
| TGHDR8CBALT5D | 8,0 | 10 | 48,0 | 110 |
| TGHDR8.1CBALT5D | 8,1 | 10 | 48,6 | 110 |
| TGHDR8.2CBALT5D | 8,2 | 10 | 49,2 | 110 |

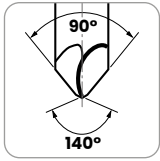
| Product Code | Ø d | Ø D | FL | L |
|------------------|------|-----|------|-----|
| TGHDR8.3CBALT5D | 8,3 | 10 | 49,8 | 110 |
| TGHDR8.4CBALT5D | 8,4 | 10 | 50,4 | 110 |
| TGHDR8.5CBALT5D | 8,5 | 10 | 51,0 | 110 |
| TGHDR8.6CBALT5D | 8,6 | 10 | 51,6 | 110 |
| TGHDR8.7CBALT5D | 8,7 | 10 | 52,2 | 110 |
| TGHDR8.8CBALT5D | 8,8 | 10 | 52,8 | 110 |
| TGHDR8.9CBALT5D | 8,9 | 10 | 53,4 | 110 |
| TGHDR9CBALT5D | 9,0 | 10 | 54,0 | 110 |
| TGHDR9.1CBALT5D | 9,1 | 10 | 54,6 | 110 |
| TGHDR9.2CBALT5D | 9,2 | 10 | 55,2 | 110 |
| TGHDR9.3CBALT5D | 9,3 | 10 | 55,8 | 110 |
| TGHDR9.4CBALT5D | 9,4 | 12 | 56,4 | 140 |
| TGHDR9.5CBALT5D | 9,5 | 12 | 57,0 | 140 |
| TGHDR9.6CBALT5D | 9,6 | 12 | 57,6 | 140 |
| TGHDR9.7CBALT5D | 9,7 | 12 | 58,2 | 140 |
| TGHDR9.8CBALT5D | 9,8 | 12 | 58,8 | 140 |
| TGHDR9.9CBALT5D | 9,9 | 12 | 59,4 | 140 |
| TGHDR10CBALT5D | 10,0 | 12 | 60,0 | 140 |
| TGHDR10.1CBALT5D | 10,1 | 12 | 60,6 | 140 |
| TGHDR10.2CBALT5D | 10,2 | 12 | 61,2 | 140 |
| TGHDR10.3CBALT5D | 10,3 | 12 | 61,8 | 140 |
| TGHDR10.4CBALT5D | 10,4 | 12 | 62,4 | 140 |
| TGHDR10.5CBALT5D | 10,5 | 12 | 63,0 | 140 |
| TGHDR10.6CBALT5D | 10,6 | 12 | 63,6 | 140 |
| TGHDR10.7CBALT5D | 10,7 | 12 | 64,2 | 140 |
| TGHDR10.8CBALT5D | 10,8 | 12 | 64,8 | 140 |
| TGHDR10.9CBALT5D | 10,9 | 12 | 65,4 | 140 |
| TGHDR11CBALT5D | 11,0 | 12 | 66,0 | 140 |
| TGHDR11.1CBALT5D | 11,1 | 12 | 66,6 | 140 |
| TGHDR11.2CBALT5D | 11,2 | 12 | 67,2 | 140 |
| TGHDR11.3CBALT5D | 11,3 | 12 | 67,8 | 140 |
| TGHDR11.4CBALT5D | 11,4 | 14 | 68,4 | 160 |
| TGHDR11.5CBALT5D | 11,5 | 14 | 69,0 | 160 |
| TGHDR11.6CBALT5D | 11,6 | 14 | 69,6 | 160 |
| TGHDR11.7CBALT5D | 11,7 | 14 | 70,2 | 160 |
| TGHDR11.8CBALT5D | 11,8 | 14 | 70,8 | 160 |
| TGHDR11.9CBALT5D | 11,9 | 14 | 71,4 | 160 |
| TGHDR12CBALT5D | 12,0 | 14 | 72,0 | 160 |

TOGLON HARD DRILL REGULAR 5D

TOGLON HARD DRILL REGULAR

10xD • Tolerance H7 • ALT Coating

IWATA TOOL



SOLID CARBIDE MATERIAL

ALT COATING

SHANK h6

FLUTES 3

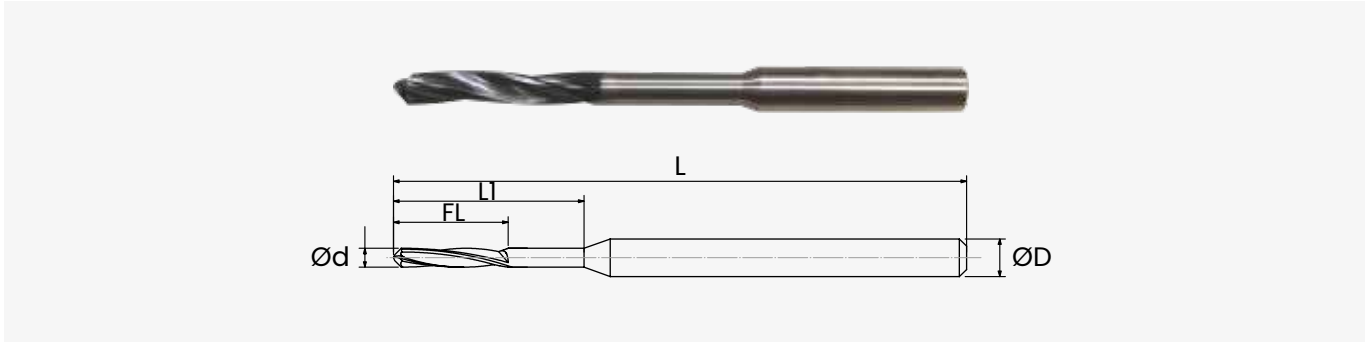
TIP 90° 140°

10xD

R

0.8~6.0

H7



TOGLON HARD DRILL REGULAR

| Product Code | Ø d | Ø D | FL | L1 | L |
|---------------|-----|-----|------|------|----|
| TGHDR0.8CBALT | 0,8 | 3 | 4,8 | 9,6 | 50 |
| TGHDR0.9CBALT | 0,9 | 3 | 5,4 | 10,8 | 50 |
| TGHDR1CBALT | 1,0 | 3 | 6,0 | 12,0 | 50 |
| TGHDR1.1CBALT | 1,1 | 3 | 6,6 | 13,2 | 50 |
| TGHDR1.2CBALT | 1,2 | 3 | 7,2 | 14,4 | 50 |
| TGHDR1.3CBALT | 1,3 | 3 | 7,8 | 15,6 | 50 |
| TGHDR1.4CBALT | 1,4 | 3 | 8,4 | 16,8 | 50 |
| TGHDR1.5CBALT | 1,5 | 3 | 9,0 | 18,0 | 50 |
| TGHDR1.6CBALT | 1,6 | 3 | 9,6 | 19,2 | 50 |
| TGHDR1.7CBALT | 1,7 | 3 | 10,2 | 20,4 | 50 |
| TGHDR1.8CBALT | 1,8 | 3 | 10,8 | 21,6 | 50 |
| TGHDR1.9CBALT | 1,9 | 3 | 11,4 | 22,8 | 50 |
| TGHDR2CBALT | 2,0 | 4 | 12,0 | 24,0 | 60 |
| TGHDR2.1CBALT | 2,1 | 4 | 12,6 | 25,2 | 60 |
| TGHDR2.2CBALT | 2,2 | 4 | 13,2 | 26,4 | 60 |
| TGHDR2.3CBALT | 2,3 | 4 | 13,8 | 27,6 | 60 |
| TGHDR2.4CBALT | 2,4 | 4 | 14,4 | 28,8 | 60 |
| TGHDR2.5CBALT | 2,5 | 4 | 15,0 | 30,0 | 60 |
| TGHDR2.6CBALT | 2,6 | 4 | 15,6 | 31,2 | 60 |
| TGHDR2.7CBALT | 2,7 | 4 | 16,2 | 32,4 | 60 |

| Product Code | Ø d | Ø D | FL | L1 | L |
|---------------|-----|-----|------|------|-----|
| TGHDR2.8CBALT | 2,8 | 4 | 16,8 | 33,6 | 60 |
| TGHDR2.9CBALT | 2,9 | 4 | 17,4 | 34,8 | 60 |
| TGHDR3CBALT | 3,0 | 4 | 18,0 | 36,0 | 60 |
| TGHDR3.1CBALT | 3,1 | 4 | 18,6 | 37,2 | 80 |
| TGHDR3.2CBALT | 3,2 | 4 | 19,2 | 38,4 | 80 |
| TGHDR3.3CBALT | 3,3 | 4 | 19,8 | 39,6 | 80 |
| TGHDR3.4CBALT | 3,4 | 4 | 20,4 | 40,8 | 80 |
| TGHDR3.5CBALT | 3,5 | 4 | 21,0 | 42,0 | 80 |
| TGHDR3.6CBALT | 3,6 | 6 | 21,6 | 43,2 | 100 |
| TGHDR3.7CBALT | 3,7 | 6 | 22,2 | 44,4 | 100 |
| TGHDR3.8CBALT | 3,8 | 6 | 22,8 | 45,6 | 100 |
| TGHDR3.9CBALT | 3,9 | 6 | 23,4 | 46,8 | 100 |
| TGHDR4CBALT | 4,0 | 6 | 24,0 | 48,0 | 100 |
| TGHDR4.1CBALT | 4,1 | 6 | 24,6 | 49,2 | 100 |
| TGHDR4.2CBALT | 4,2 | 6 | 25,2 | 50,4 | 100 |
| TGHDR4.3CBALT | 4,3 | 6 | 25,8 | 51,6 | 100 |
| TGHDR4.4CBALT | 4,4 | 6 | 26,4 | 52,8 | 100 |
| TGHDR4.5CBALT | 4,5 | 6 | 27,0 | 54,0 | 100 |
| TGHDR4.6CBALT | 4,6 | 6 | 27,6 | 55,2 | 100 |
| TGHDR4.7CBALT | 4,7 | 6 | 28,2 | 56,4 | 100 |

Continue >>

Suitable Work Materials: Most Suitable [●●●] Suitable [●●] Possible [○]

| Mild Steel | Carbon Steel | Alloy Steel | Heat treated Steel | Tool Steel | Hardened Steel | | Stainless Steel | Cast Iron | Ductile Cast Iron | Titanium Alloy | Aluminium Alloy | Copper | Plastic | Ceramics etc. | |
|------------|--------------|-------------|--------------------|------------|----------------|---------|-----------------|-----------|-------------------|----------------|-----------------|--------|---------|---------------|----------------|
| SS | S45C | SCM SCR | SKD SKS | ~40 HRC | ~45 HRC | 45~ HRC | SUS | FC | FDC | | Al | Cu | | Machinable | Zirconia Glass |
| | | | ○ | | ●●● | ●●● | | | | ○ | | | | ●● | |

TOGLON HARD DRILL REGULAR

10xD • Tolerance H7 • ALT Coating

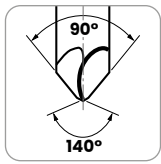
 IWATA TOOL

| Product Code | Ø d | Ø D | FL | L1 | L |
|---------------|-----|-----|------|------|-----|
| TGHDR4.8CBALT | 4,8 | 6 | 28,8 | 57,6 | 100 |
| TGHDR4.9CBALT | 4,9 | 6 | 29,4 | 58,8 | 100 |
| TGHDR5CBALT | 5,0 | 6 | 30,0 | 60,0 | 100 |
| TGHDR5.1CBALT | 5,1 | 6 | 30,6 | 61,2 | 120 |
| TGHDR5.2CBALT | 5,2 | 6 | 31,2 | 62,4 | 120 |
| TGHDR5.3CBALT | 5,3 | 6 | 31,8 | 63,6 | 120 |
| TGHDR5.4CBALT | 5,4 | 6 | 32,4 | 64,8 | 120 |
| TGHDR5.5CBALT | 5,5 | 6 | 33,0 | 66,0 | 120 |
| TGHDR5.6CBALT | 5,6 | 8 | 33,6 | 67,2 | 120 |
| TGHDR5.7CBALT | 5,7 | 8 | 34,2 | 68,4 | 120 |
| TGHDR5.8CBALT | 5,8 | 8 | 34,8 | 69,6 | 120 |

| Product Code | Ø d | Ø D | FL | L1 | L |
|---------------|-----|-----|------|------|-----|
| TGHDR5.9CBALT | 5,9 | 8 | 35,4 | 70,8 | 120 |
| TGHDR6CBALT | 6,0 | 8 | 36,0 | 72,0 | 120 |
| | | | | | |
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TOGLON HARD DRILL LONG 20D

20xD • Tolerance H7 • ALT Coating



SOLID CARBIDE MATERIAL

ALT COATING

SHANK h6

FLUTES 3

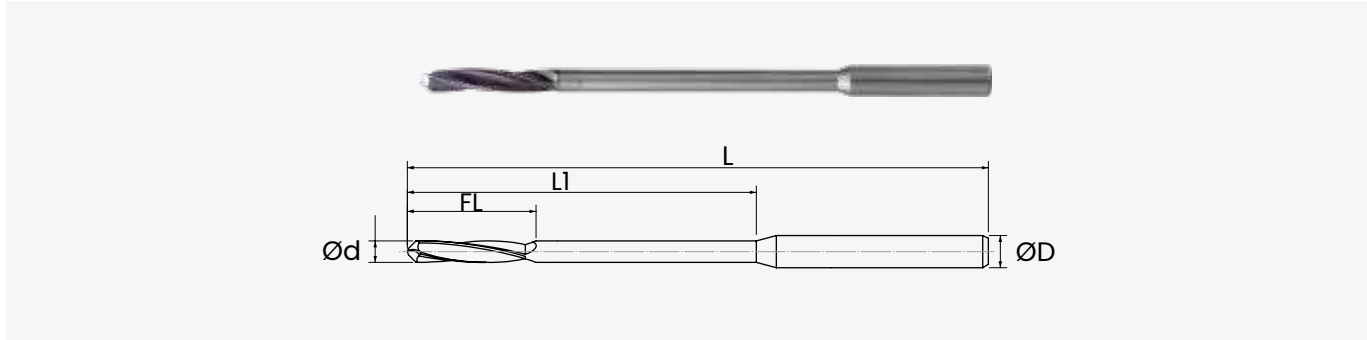
TIP 90° 140°

20xD



0.8~6.0

H7



TOGLON HARD DRILL LONG 20D

| Product Code | Ø d | Ø D | FL | L1 | L |
|------------------|-----|-----|------|------|-----|
| TGHDL0.8CBALT20D | 0,8 | 3 | 4,8 | 18,4 | 50 |
| TGHDL0.9CBALT20D | 0,9 | 3 | 5,4 | 20,7 | 50 |
| TGHDL1.0CBALT20D | 1,0 | 4 | 6,0 | 23,0 | 60 |
| TGHDL1.1CBALT20D | 1,1 | 4 | 6,6 | 25,3 | 60 |
| TGHDL1.2CBALT20D | 1,2 | 4 | 7,2 | 27,6 | 60 |
| TGHDL1.3CBALT20D | 1,3 | 4 | 7,8 | 29,9 | 60 |
| TGHDL1.4CBALT20D | 1,4 | 4 | 8,4 | 32,2 | 60 |
| TGHDL1.5CBALT20D | 1,5 | 4 | 9,0 | 34,5 | 60 |
| TGHDL1.6CBALT20D | 1,6 | 4 | 9,6 | 36,8 | 80 |
| TGHDL1.7CBALT20D | 1,7 | 4 | 10,2 | 39,1 | 80 |
| TGHDL1.8CBALT20D | 1,8 | 4 | 10,8 | 41,4 | 80 |
| TGHDL1.9CBALT20D | 1,9 | 4 | 11,4 | 43,7 | 80 |
| TGHDL2.0CBALT20D | 2,0 | 4 | 12,0 | 46,0 | 80 |
| TGHDL2.1CBALT20D | 2,1 | 4 | 12,6 | 48,3 | 80 |
| TGHDL2.2CBALT20D | 2,2 | 4 | 13,2 | 50,6 | 80 |
| TGHDL2.3CBALT20D | 2,3 | 4 | 13,8 | 52,9 | 80 |
| TGHDL2.4CBALT20D | 2,4 | 4 | 14,4 | 55,2 | 80 |
| TGHDL2.5CBALT20D | 2,5 | 6 | 15,0 | 57,5 | 100 |
| TGHDL2.6CBALT20D | 2,6 | 6 | 15,6 | 59,8 | 100 |
| TGHDL2.7CBALT20D | 2,7 | 6 | 16,2 | 62,1 | 100 |

| Product Code | Ø d | Ø D | FL | L1 | L |
|------------------|-----|-----|------|-------|-----|
| TGHDL2.8CBALT20D | 2,8 | 6 | 16,8 | 64,4 | 100 |
| TGHDL2.9CBALT20D | 2,9 | 6 | 17,4 | 66,7 | 100 |
| TGHDL3.0CBALT20D | 3,0 | 6 | 18,0 | 69,0 | 100 |
| TGHDL3.1CBALT20D | 3,1 | 6 | 18,6 | 71,3 | 120 |
| TGHDL3.2CBALT20D | 3,2 | 6 | 19,2 | 73,6 | 120 |
| TGHDL3.3CBALT20D | 3,3 | 6 | 19,8 | 75,9 | 120 |
| TGHDL3.4CBALT20D | 3,4 | 6 | 20,4 | 78,2 | 120 |
| TGHDL3.5CBALT20D | 3,5 | 6 | 21,0 | 80,5 | 120 |
| TGHDL3.6CBALT20D | 3,6 | 6 | 21,6 | 82,8 | 120 |
| TGHDL3.7CBALT20D | 3,7 | 6 | 22,2 | 85,1 | 120 |
| TGHDL3.8CBALT20D | 3,8 | 6 | 22,8 | 87,4 | 120 |
| TGHDL3.9CBALT20D | 3,9 | 6 | 23,4 | 89,7 | 120 |
| TGHDL4.0CBALT20D | 4,0 | 6 | 24,0 | 92,0 | 120 |
| TGHDL4.1CBALT20D | 4,1 | 6 | 24,6 | 94,3 | 150 |
| TGHDL4.2CBALT20D | 4,2 | 6 | 25,2 | 96,6 | 150 |
| TGHDL4.3CBALT20D | 4,3 | 6 | 25,8 | 98,9 | 150 |
| TGHDL4.4CBALT20D | 4,4 | 6 | 26,4 | 101,2 | 150 |
| TGHDL4.5CBALT20D | 4,5 | 6 | 27,0 | 103,5 | 150 |
| TGHDL4.6CBALT20D | 4,6 | 6 | 27,6 | 105,8 | 150 |
| TGHDL4.7CBALT20D | 4,7 | 6 | 28,2 | 108,1 | 150 |

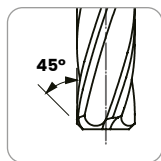
Continue >>

Suitable Work Materials: Most Suitable [●●●] Suitable [●●] Possible [○]

| Mild Steel | Carbon Steel | Alloy Steel | Heat treated Steel | Tool Steel | Hardened Steel | | Stainless Steel | Cast Iron | Ductile Cast Iron | Titanium Alloy | Aluminium Alloy | Copper | Plastic | Ceramics etc. | |
|------------|--------------|-------------|--------------------|------------|----------------|---------|-----------------|-----------|-------------------|----------------|-----------------|--------|---------|---------------|----------------|
| SS | S45C | SCM SCR | SKD SKS | ~40 HRC | ~45 HRC | 45~ HRC | SUS | FC | FDC | | Al | Cu | | Machinable | Zirconia Glass |
| | | | ○ | | ●●● | ●●● | | | | ○ | | | | ●● | |

TOGLON HARD REAMER

ALT Coating



SOLID CARBIDE MATERIAL

ALT COATING

SHANK h6

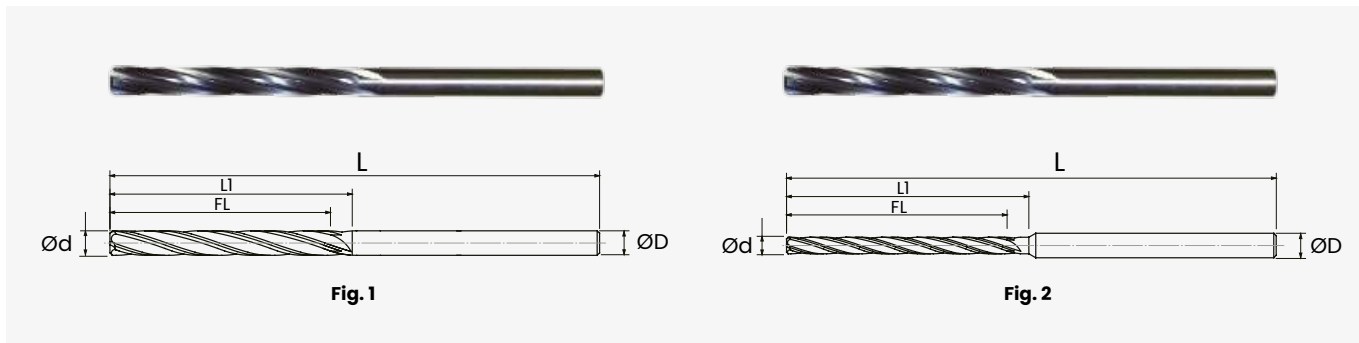
FLUTES 4

CHAMFER 45°



2.99~12.02

H7



TOGLON HARD REAMER

| Product Code | Ø d | Ø D | FL | L1 | L | Tol. | Fig. |
|---------------|------|-----|----|----|-----|------|------|
| TGHR2.99CBALT | 2,99 | 4 | 40 | 44 | 80 | A | 2 |
| TGHR3.00CBALT | 3,00 | 4 | 40 | 44 | 80 | A | 2 |
| TGHR3.01CBALT | 3,01 | 4 | 40 | 44 | 80 | A | 2 |
| TGHR3.02CBALT | 3,02 | 4 | 40 | 44 | 80 | A | 2 |
| TGHR3.99CBALT | 3,99 | 4 | 40 | 44 | 80 | B | 1 |
| TGHR4.00CBALT | 4,00 | 4 | 40 | 44 | 80 | B | 1 |
| TGHR4.01CBALT | 4,01 | 4 | 40 | 44 | 80 | B | 1 |
| TGHR4.02CBALT | 4,02 | 4 | 40 | 44 | 80 | B | 1 |
| TGHR4.99CBALT | 4,99 | 6 | 50 | 57 | 100 | B | 2 |
| TGHR5.00CBALT | 5,00 | 6 | 50 | 57 | 100 | B | 2 |
| TGHR5.01CBALT | 5,01 | 6 | 50 | 57 | 100 | B | 2 |
| TGHR5.02CBALT | 5,02 | 6 | 50 | 57 | 100 | B | 2 |
| TGHR5.99CBALT | 5,99 | 6 | 50 | 57 | 100 | B | 1 |
| TGHR6.00CBALT | 6,00 | 6 | 50 | 57 | 100 | B | 1 |
| TGHR6.01CBALT | 6,01 | 6 | 50 | 57 | 100 | B | 1 |
| TGHR6.02CBALT | 6,02 | 6 | 50 | 57 | 100 | B | 1 |
| TGHR6.99CBALT | 6,99 | 8 | 50 | 60 | 100 | C | 2 |
| TGHR7.00CBALT | 7,00 | 8 | 50 | 60 | 100 | C | 2 |
| TGHR7.01CBALT | 7,01 | 8 | 50 | 60 | 100 | C | 2 |
| TGHR7.02CBALT | 7,02 | 8 | 50 | 60 | 100 | C | 2 |

| Product Code | Ø d | Ø D | FL | L1 | L | Tol. | Fig. |
|----------------|-------|-----|----|----|-----|------|------|
| TGHR7.99CBALT | 7,99 | 8 | 50 | 60 | 100 | C | 1 |
| TGHR8.00CBALT | 8,00 | 8 | 50 | 60 | 100 | C | 1 |
| TGHR8.01CBALT | 8,01 | 8 | 50 | 60 | 100 | C | 1 |
| TGHR8.02CBALT | 8,02 | 8 | 50 | 60 | 100 | C | 1 |
| TGHR8.99CBALT | 8,99 | 10 | 60 | 73 | 120 | C | 2 |
| TGHR9.00CBALT | 9,00 | 10 | 60 | 73 | 120 | C | 2 |
| TGHR9.01CBALT | 9,01 | 10 | 60 | 73 | 120 | C | 2 |
| TGHR9.02CBALT | 9,02 | 10 | 60 | 73 | 120 | C | 2 |
| TGHR9.99CBALT | 9,99 | 10 | 60 | 73 | 120 | C | 1 |
| TGHR10.00CBALT | 10,00 | 10 | 60 | 73 | 120 | C | 1 |
| TGHR10.01CBALT | 10,01 | 10 | 60 | 73 | 120 | C | 1 |
| TGHR10.02CBALT | 10,02 | 10 | 60 | 73 | 120 | C | 1 |
| TGHR10.99CBALT | 10,99 | 12 | 70 | 86 | 140 | D | 2 |
| TGHR11.00CBALT | 11,00 | 12 | 70 | 86 | 140 | D | 2 |
| TGHR11.01CBALT | 11,01 | 12 | 70 | 86 | 140 | D | 2 |
| TGHR11.02CBALT | 11,02 | 12 | 70 | 86 | 140 | D | 2 |
| TGHR11.99CBALT | 11,99 | 12 | 70 | 86 | 140 | D | 1 |
| TGHR12.00CBALT | 12,00 | 12 | 70 | 86 | 140 | D | 1 |
| TGHR12.01CBALT | 12,01 | 12 | 70 | 86 | 140 | D | 1 |
| TGHR12.02CBALT | 12,02 | 12 | 70 | 86 | 140 | D | 1 |

| Ø D Tolerance | A | | B | | C | | D | |
|---------------|--------|--------|--------|--------|--------|--------|--------|--------|
| | +0.007 | +0.002 | +0.009 | +0.003 | +0.011 | +0.004 | +0.013 | +0.006 |

Suitable Work Materials: Most Suitable [●●●] Suitable [●●] Possible [○]

| Mild Steel | Carbon Steel | Alloy Steel | Heat treated Steel | Tool Steel | Hardened Steel | | Stainless Steel | Cast Iron | Ductile Cast Iron | Titanium Alloy | Aluminium Alloy | Copper | Plastic | Ceramics etc. | |
|------------|--------------|-------------|--------------------|------------|----------------|---------|-----------------|-----------|-------------------|----------------|-----------------|--------|---------|---------------|----------------|
| SS | S45C | SCM SCR | SKD SKS | ~40 HRC | ~45 HRC | 45~ HRC | SUS | FC | FDC | | Al | Cu | | Machinable | Zirconia Glass |
| | | | ○ | | ●●● | ●●● | | | | ○ | | | | ●● | |



△ IWATA TOOL

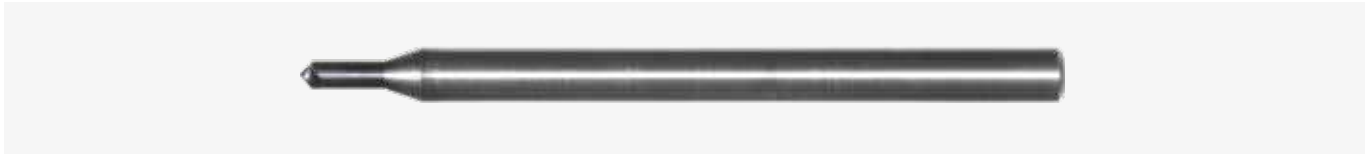
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| TOGLON HARD REAMER | 30 |



TOGLON HARD SP 90° MINIATURE

CUTTING CONDITIONS



| | |
|----------------------|--|
| Work Material | 50~60 HRC Hardened Steels (SKD, HSS) |
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| | |
|----------------------|-----------------------|
| V_c | 10-30 m/min |
|----------------------|-----------------------|

| Max chamfering diameter mm | Speed Min-1 | | Feed (drilling) Mm/rev-1 | | Feed (V grooving) Mm/rev-1 | |
|----------------------------|-------------|-------|--------------------------|-------|----------------------------|-------|
| | Min | Max | Min | Max | Min | Max |
| 0,3 | 10600 | 31800 | 0,002 | 0,010 | 0,003 | 0,012 |
| 0,5 | 6400 | 1900 | 0,005 | 0,015 | 0,010 | 0,020 |
| 1,0 | 3200 | 9500 | 0,010 | 0,030 | 0,020 | 0,040 |
| 1,5 | 2100 | 6400 | 0,020 | 0,040 | 0,030 | 0,050 |

PLEASE OBSERVE WHEN CHOOSING THE CUTTING CONDITIONS

- The above values are standard conditions. They need to be adapted for optimal use of the tools.
- For drilling please use ample water soluble coolant or oil mist.
- Please lower the speed when working conditions are not stable (vibrations, moving of work piece, etc.).
- If the recommended cutting speed exceeds the maximum speed of the machine used, please use the maximum speed of the machine and adjust the other work parameters accordingly.
- For smoother surfaces please decrease the feed rate (this may cause shorter tool life).
- Drilling without step cycles is possible.



- Please chose the size of the centering drill equal to the drill diameter. If this size does not exist please chose the next bigger size.

For example:

For TGHDR5.2CBALT please chose 90TGHSP6CBALD

- The drilling depth of the center drill is calculated by 0.6 x the diameter of the DRILL (not of the Center Drill).

For example:

For drilling a bore of diameter 5.2 mm please use the center drill 90TGHSP6CBALD and a depth of 0.3 x 5.2 = 1,56 mm



- For centering a Toglon Hard Drill always use 90° Toglon Hard SP center drills (NEVER 60° Toglon Hard SP)
- The Drilling depth may not exceed 45% of the tool diameter.



| | |
|----------------------|--|
| Work Material | 50~60 HRC Hardened Steels (SKD, HSS) |
|----------------------|--|

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|----------------------|-----------------------|
| V_c | 20-40 m/min |
|----------------------|-----------------------|

| Max chamfering diameter mm | Speed Min-1 | | Feed (drilling) Mm/rev-1 | | Feed (V grooving) Mm/rev-1 | |
|----------------------------|-------------|------|--------------------------|-------|----------------------------|-------|
| | Min | Max | Min | Max | Min | Max |
| 1 | 3600 | 7200 | 0,100 | 0,030 | 0,010 | 0,030 |
| 2 | 2800 | 5500 | 0,015 | 0,050 | 0,015 | 0,050 |
| 3 | 2100 | 4200 | 0,020 | 0,060 | 0,030 | 0,080 |
| 4 | 1600 | 3200 | 0,020 | 0,060 | 0,030 | 0,080 |
| 6 | 1100 | 2100 | 0,020 | 0,060 | 0,050 | 0,100 |
| 8 | 800 | 1600 | 0,030 | 0,080 | 0,100 | 0,200 |
| 10 | 600 | 1300 | 0,050 | 0,130 | 0,200 | 0,300 |
| 12 | 500 | 1100 | 0,100 | 0,200 | 0,200 | 0,500 |
| 16 | 400 | 800 | 0,100 | 0,200 | 0,300 | 0,600 |
| 20 | 300 | 600 | 0,100 | 0,200 | 0,300 | 0,600 |

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- For drilling please use ample water soluble coolant or oil mist.
- Please lower the speed when working conditions are not stable (vibrations, moving of work piece, etc.).
- If the recommended cutting speed exceeds the maximum speed of the machine used, please use the maximum speed of the machine and adjust the other work parameters accordingly.
- For smoother surfaces please decrease the feed rate (this may cause shorter tool life).
- Drilling without step cycles is possible.



- Please chose the size of the centering drill equal to the drill diameter. If this size does not exist please chose the next bigger size.

For example:

For TGHDR5.2CBALT please chose 90TGHSP6CBALD

- The drilling depth of the center drill is calculated by 0.6 x the diameter of the DRILL (not of the Center Drill).

For example:

For drilling a bore of diameter 5.2 mm please use the center drill 90TGHSP6CBALD and a depth of 0.3 x 5.2 = 1,56 mm



- For centering a Toglon Hard Drill always use 90° Toglon Hard SP center drills (NEVER 60° Toglon Hard SP)
- The Drilling depth may not exceed 45% of the tool diameter.

TOGLON HARD DRILL MINIATURE

CUTTING CONDITIONS



| | |
|----------------------|--|
| Work Material | 50~60 HRC Hardened Steels (SKD, HSS) |
|----------------------|--|

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|---|
| 50~60 HRC High Vanadium or Chromium Steels / Super Clean Steels |
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| | |
|----------------------|-----------------------|
| V_c | 10~30 m/min |
|----------------------|-----------------------|

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|----------------------|
| 5-15 m/min |
|----------------------|

| Max Chamfering Diameter Mm | Speed Min-1 | | Feed Mm/rev-1 | |
|----------------------------|-------------|-------|---------------|-------|
| | Min | Max | Min | Max |
| 0,3 | 10600 | 31800 | 0,002 | 0,010 |
| 0,5 | 6400 | 19000 | 0,005 | 0,015 |
| 1,0 | 3200 | 9500 | 0,010 | 0,030 |
| 1,5 | 2100 | 6400 | 0,020 | 0,040 |
| 2,0 | 1600 | 4800 | 0,020 | 0,050 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

| Speed Min-1 | | Feed Mm/rev-1 | |
|-------------|-------|---------------|-------|
| Min | Max | Min | Max |
| 5300 | 15900 | 0,0015 | 0,007 |
| 3200 | 9500 | 0,0040 | 0,010 |
| 1600 | 4750 | 0,0070 | 0,020 |
| 1050 | 3200 | 0,0140 | 0,030 |
| 800 | 2400 | 0,0140 | 0,035 |
| | | | |
| | | | |
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| | | | |

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- For drilling please use ample water soluble coolant or oil mist.
- Please lower the speed when working conditions are not stable (vibrations, moving of work piece, etc.).
- If the recommended cutting speed exceeds the maximum speed of the machine used, please use the maximum speed of the machine and adjust the other work parameters accordingly.
- For smoother surfaces please decrease the feed rate (this may cause shorter tool life).
- Drilling without step cycles is possible. When drilling deeper than 3xD step drilling is recommended for better chip removal. We recommend step cycles of 10% to 50% of the tool diameter. Shorter step cycles will improve the chip removal, the cooling of the cutting edges and increase tool life.

TOGLON HARD DRILL SHORT • REGULAR • LONG 20D

CUTTING CONDITIONS



| Work Material | 40~50 HRC Hardened Steels | | | | | 50~60 HRC Hardened Steels | | | | | 60~65 HRC Hardened Steels | | | | | | | |
|---------------|------------------------------|----------------------|-------------|---------------|-------------|------------------------------|-------------|----------------------|-------------|---------------|------------------------------|------------|-------------|----------------------|-------------|---------------|-------------|------------|
| | Diameter mm | V _c m/min | Speed Min-1 | Feed Mm/rev-1 | Feed mm/min | Pecking mm | Diameter mm | V _c m/min | Speed Min-1 | Feed Mm/rev-1 | Feed mm/min | Pecking mm | Diameter mm | V _c m/min | Speed Min-1 | Feed Mm/rev-1 | Feed mm/min | Pecking mm |
| | 0,8 | 26 | 10300 | 0,020 | 210 | 0,2 | 20 | 8000 | 0,015 | 120 | 0,18 | 13 | 5200 | 0,010 | 50 | 0,15 | | |
| | 1,0 | 30 | 9500 | 0,025 | 240 | 0,3 | 22 | 7000 | 0,020 | 140 | 0,24 | 15 | 4800 | 0,015 | 70 | 0,22 | | |
| | 1,5 | 35 | 7400 | 0,035 | 260 | 0,4 | 24 | 5100 | 0,030 | 150 | 0,36 | 18 | 3800 | 0,020 | 80 | 0,30 | | |
| | 2,0 | 40 | 6400 | 0,045 | 290 | 0,5 | 30 | 4800 | 0,035 | 170 | 0,42 | 20 | 3200 | 0,025 | 80 | 0,38 | | |
| | 3,0 | 40 | 4200 | 0,060 | 250 | 0,6 | 30 | 3200 | 0,050 | 160 | 0,60 | 20 | 2100 | 0,035 | 70 | 0,53 | | |
| | 4,0 | 40 | 3200 | 0,075 | 240 | 0,8 | 30 | 2400 | 0,060 | 140 | 0,72 | 20 | 1600 | 0,040 | 60 | 0,60 | | |
| | 6,0 | 40 | 2100 | 0,100 | 210 | 1,0 | 30 | 1600 | 0,080 | 130 | 0,96 | 20 | 1100 | 0,050 | 60 | 0,75 | | |
| | 8,0 | 40 | 1600 | 0,120 | 190 | 1,2 | 30 | 1200 | 0,100 | 120 | 1,20 | 20 | 800 | 0,050 | 40 | 0,75 | | |
| | 10,0 | 40 | 1300 | 0,130 | 170 | 1,3 | 30 | 1000 | 0,110 | 110 | 1,32 | 20 | 600 | 0,050 | 30 | 0,75 | | |
| | 12,0 | 40 | 1100 | 0,140 | 150 | 1,4 | 30 | 800 | 0,110 | 90 | 1,32 | 20 | 500 | 0,050 | 30 | 0,75 | | |

| Work Material | 65 HRC Hardened Steels | | | | |
|---------------|---------------------------|-------------|---------------|-------------|------------|
| Diameter mm | V _c m/min | Speed Min-1 | Feed Mm/rev-1 | Feed mm/min | Pecking mm |
| 0,8 | 10 | 4000 | 0,006 | 20 | 0,09 |
| 1,0 | 11 | 3500 | 0,008 | 30 | 0,12 |
| 1,5 | 13 | 2800 | 0,010 | 30 | 0,15 |
| 2,0 | 15 | 2400 | 0,012 | 30 | 0,18 |
| 3,0 | 15 | 1600 | 0,018 | 30 | 0,27 |
| 4,0 | 15 | 1200 | 0,025 | 30 | 0,38 |
| 6,0 | 15 | 800 | 0,035 | 30 | 0,53 |
| 8,0 | 15 | 600 | 0,040 | 20 | 0,60 |
| 10,0 | 15 | 500 | 0,040 | 20 | 0,60 |
| 12,0 | 15 | 400 | 0,040 | 20 | 0,60 |

| 50~60 HRC High Vanadium or Chromium Steels / Super Clean Steels | | | | |
|--|-------------|---------------|-------------|------------|
| V _c m/min | Speed Min-1 | Feed Mm/rev-1 | Feed mm/min | Pecking mm |
| 10 | 4000 | 0,010 | 40 | 0,05 |
| 11 | 3500 | 0,015 | 50 | 0,07 |
| 12 | 2500 | 0,020 | 50 | 0,10 |
| 15 | 2400 | 0,025 | 60 | 0,12 |
| 15 | 1600 | 0,035 | 55 | 0,18 |
| 15 | 1200 | 0,040 | 50 | 0,20 |
| 15 | 800 | 0,055 | 45 | 0,30 |
| 15 | 600 | 0,070 | 40 | 0,35 |
| 15 | 500 | 0,080 | 40 | 0,40 |
| 15 | 400 | 0,080 | 30 | 0,40 |

PLEASE OBSERVE WHEN CHOOSING THE CUTTING CONDITIONS

- The above values are standard conditions. They need to be adapted for optimal use of the tools
- For drilling please use ample water soluble coolant or oil mist.
- Please lower the speed when working conditions are not stable (vibrations, moving of work piece, etc.).
- If the recommended cutting speed exceeds the maximum speed of the machine used, please use the maximum speed of the machine and adjust the other work parameters accordingly.
- For smoother surfaces please decrease the feed rate (this may cause shorter tool life).
- Drilling without step cycles is possible. When drilling deeper than 3xD step drilling is recommended for better chip removal. We recommend step cycles of 10% to 50% of the tool diameter. Shorter step cycles will improve the chip removal, the cooling of the cutting edges and increase tool life.
- Drilling without step cycles is possible until 3xD. When drilling deeper than 3xD step drilling is necessary. We recommend step cycles of 10% to 50% of the tool diameter. Shorter step cycles will improve the chip removal, the cooling of the cutting edges and increase tool life.

TOGLON HARD DRILL LONG 30D • 50D

CUTTING CONDITIONS



| Work Material | 40~50 HRC Hardened Steels | | | | | 50~60 HRC Hardened Steels | | | | | 60~65 HRC Hardened Steels | | | | |
|---------------|------------------------------|--|--|--|--|------------------------------|--|--|--|--|------------------------------|--|--|--|--|
|---------------|------------------------------|--|--|--|--|------------------------------|--|--|--|--|------------------------------|--|--|--|--|

| Diameter mm | V _c m/min | Speed Min-1 | Feed Mm/rev-1 | Feed mm/min | Pecking mm | V _c m/min | Speed Min-1 | Feed Mm/rev-1 | Feed mm/min | Pecking mm | V _c m/min | Speed Min-1 | Feed Mm/rev-1 | Feed mm/min | Pecking mm |
|-------------|----------------------|-------------|---------------|-------------|------------|----------------------|-------------|---------------|-------------|------------|----------------------|-------------|---------------|-------------|------------|
| 0,8 | 22 | 8800 | 0,017 | 150 | 0,1 | 17 | 6800 | 0,013 | 90 | 0,1 | 11 | 4400 | 0,009 | 40 | 0,1 |
| 1,0 | 26 | 8300 | 0,021 | 170 | 0,2 | 19 | 6000 | 0,017 | 100 | 0,1 | 13 | 4100 | 0,013 | 50 | 0,1 |
| 1,5 | 30 | 6400 | 0,030 | 190 | 0,2 | 20 | 4200 | 0,026 | 110 | 0,2 | 15 | 3200 | 0,017 | 50 | 0,1 |
| 2,0 | 34 | 5400 | 0,038 | 210 | 0,3 | 26 | 4100 | 0,030 | 120 | 0,2 | 17 | 2700 | 0,021 | 60 | 0,2 |
| 3,0 | 34 | 3600 | 0,051 | 180 | 0,4 | 26 | 2800 | 0,043 | 120 | 0,3 | 17 | 1800 | 0,030 | 50 | 0,2 |

| Work Material | 65 HRC Hardened Steels | | | | |
|---------------|---------------------------|--|--|--|--|
|---------------|---------------------------|--|--|--|--|

| Diameter mm | V _c m/min | Speed Min-1 | Feed Mm/rev-1 | Feed mm/min | Pecking mm |
|-------------|----------------------|-------------|---------------|-------------|------------|
| 0,8 | 9 | 3600 | 0,005 | 20 | 0,06 |
| 1,0 | 9 | 2900 | 0,007 | 20 | 0,10 |
| 1,5 | 11 | 2300 | 0,009 | 20 | 0,10 |
| 2,0 | 13 | 2100 | 0,010 | 20 | 0,10 |
| 3,0 | 13 | 1400 | 0,015 | 20 | 0,10 |

| 50~60 HRC High Vanadium or Chromium Steels / Super Clean Steels | | | | |
|--|--|--|--|--|
|--|--|--|--|--|

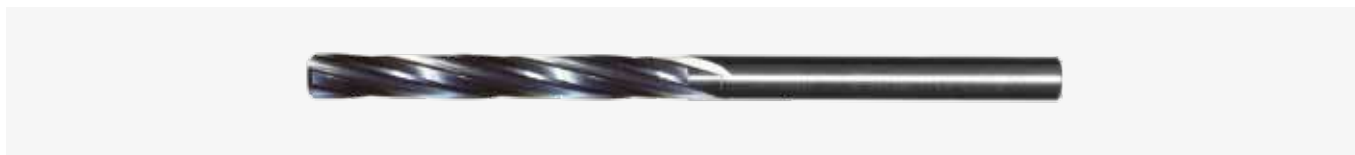
| V _c m/min | Speed Min-1 | Feed Mm/rev-1 | Feed mm/min | Pecking mm |
|----------------------|-------------|---------------|-------------|------------|
| 9 | 3600 | 0,009 | 30 | 0,1 |
| 9 | 2900 | 0,013 | 40 | 0,1 |
| 10 | 2100 | 0,017 | 40 | 0,1 |
| 13 | 2100 | 0,021 | 40 | 0,2 |
| 13 | 1400 | 0,030 | 40 | 0,2 |

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TOGLON HARD REAMER

CUTTING CONDITIONS



| | |
|----------------------|--|
| Work Material | 50~60 HRC Hardened Steels (SKD, HSS) |
|----------------------|--|

| | |
|-------------------------|-----------------------|
| V_c | 10-20 m/min |
|-------------------------|-----------------------|

| Diameter mm | Speed Min-1 | | Feed Mm/rev-1 | |
|--------------------|--------------------|------|----------------------|------|
| | Min | Max | Min | Max |
| 3 | 1100 | 2100 | 0,02 | 0,06 |
| 4 | 800 | 1600 | 0,02 | 0,07 |
| 6 | 500 | 1100 | 0,02 | 0,07 |
| 8 | 400 | 800 | 0,02 | 0,08 |
| 10 | 320 | 640 | 0,03 | 0,08 |
| 12 | 270 | 530 | 0,03 | 0,09 |

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 **IWATA TOOL**

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