

Tool Selection Guide

Drilling tools

| Series | | Indexable drill | | | | | |
|----------------------------|----------------------------|---|---|---|---|--|---|
| | | TOPDRILL | | TDRILL | | TDEEP | |
| | | TOP 2/3/4/5 | TOP-CA | TDR 2/3/4/5 | TDR-CA | TRGD/TRGD3 | |
| | |  |  |  |  |  | |
| Pages | | D16 - D27 | D28 - D31 | D32 - D44 | D45 - D47 | D144 - D150 | |
| DC(mm) | | Ø12.0 - Ø50.0 | Ø51.0 - Ø80.0 | Ø12.5 - Ø50.0 | Ø51.0 - Ø80.0 | Ø14.0 - Ø36.0 | |
| Drilling depth(L/D) | | 2, 3, 4, 5 x Dc | 2, 3, 4 x Dc | 2, 3, 4, 5 x Dc | 2.5, 3.5 x Dc | 10-25 x Dc | |
| Hole tolerance | | IT 11-13 | IT 12-13 | IT 12-13 | IT 12-13 | IT 10-11 | |
| Application | General drilling |  | ● | ● | ● | ● | ● |
| | Cross hole drilling |  | ● | ● | ● | ● | ○ |
| | Irregular surface drilling |  | ○ | ○ | ○ | ○ | |
| | Interrupted drilling |  | ○ | ○ | ○ | ○ | |
| | Chamfering |  | | | | | |
| Coolant supply | | Internal | Internal | Internal | Internal | Internal | |

Tool Selection Guide












Drilling tools

| Head changeable drill | | | | | Solid carbide drill |
|---|---|---|---|---|---|
| <i>DRILLSFEED</i> | <i>DRILLRUSH</i> | | <i>MODURDRILL</i> | <i>SPADE RUSH</i> | <i>SOLID3DRILL</i> |
| 3ED | TCD | TCD-M | TNDH-TP/ MDB | LCD | 3HD |
|  |  |  |  |  |  |
| D49 - D50 | D51 - D59 | D60 | D62 - D65 | D66 - D68 | D69 - D70 |
| Ø15.0 - Ø20.9 | Ø6.0 - Ø25.9 | M8 - M24 (ISO) | Ø26.0 - Ø50.0 | Ø20.0 - Ø41.0 | Ø4.0 - Ø12.0 |
| 3, 5 x Dc | 1.5, 3, 5, 8, 12 x Dc | | 3, 5 x Dc | 3, 5, 8 x Dc | 3, 5 x Dc |
| IT 9-10 | IT 9-10 | IT 9-10 | IT 10-12 | IT 9-10 | IT 8-10 |
| ● | ● | ● | ● | ● | ● |
| ○ | ● | | ● | ● | ● |
| | | | | | |
| | | | | | |
| | | ● | | | |
| Internal | Internal | Internal | Internal | Internal | Internal |

● Recommended, ○ Suitable

Tool Selection Guide

Drilling tools

| Series | | Solid carbide drill | | | | | Multi-function |
|----------------------------|----------------------------|---|---|---|---|---|--|
| | | <i>HDRILL</i> | | | | | <i>TOPCAP</i> |
| | | NHD-PE/PI | NHD-KI | SHO 10/15/20 | SHO-M | CDF | TCAP |
| | |  |  |  |  |  |  |
| Pages | | D71 - D82 | D83 - D84 | D86 | D87 | D88 | D91 - D95 |
| DC(mm) | | Ø3.0 - Ø12.0 | Ø3.0 - Ø12.0 | Ø4.0 - Ø10.0 | M4 - M10 (ISO) | Ø3.0 - Ø12.7 | Ø8.0 - Ø32.0 |
| Drilling depth(L/D) | | 3, 5 x Dc | 3, 5 x Dc | 10, 15, 20 x Dc | | | 2.25, 3 x Dc |
| Hole tolerance | | IT 8-10 | IT 8-10 | IT 8-10 | IT 8-10 | IT 8-10 | IT 10-12 |
| Application | General drilling |  | ● | ● | ● | ● | ● |
| | Cross hole drilling |  | ● | ● | ○ | | |
| | Irregular surface drilling |  | | | | | ● |
| | Interrupted drilling |  | | | | | |
| | Chamfering |  | | | | ● | |
| Coolant supply | | External / Internal | Internal | Internal | Internal | External | Internal |

● Recommended, ○ Suitable

Tool Selection Guide

Deep drilling tools

| Series | | Indexable deep drill head | | | | |
|---------------------|---------------------|---------------------------|-------------------|-------------------|-------------------|-----------------|
| | | <i>TDEEP</i> | | | | |
| | | TBTA3 | TBTA5 | TBTA7 | TBTA9 | TBTA-FB |
| Pages | | D99 - D104 | D105 - D108 | D109 - D111 | D112 - D114 | D115 - D120 |
| DC(mm) | | Ø38.00 - Ø106.99 | Ø107.00 - Ø168.99 | Ø169.00 - Ø232.99 | Ø233.00 - Ø293.99 | Ø25.00 - Ø89.00 |
| Drilling depth(L/D) | | 100 x Dc | 100 x Dc | 100 x Dc | 100 x Dc | 100 x Dc |
| Hole tolerance | | IT 10 | IT 10 | IT 10 | IT 10 | IT 10 |
| Surface finish | | 3µm | 3µm | 3µm | 3µm | 3µm |
| Single tube | Outer four thread | ● | ● | ● | ● | ● |
| | Inner single thread | ● | ● | ●★ | ● | ● |
| Double tube | Outer four thread | ● | ● | | | ● |

★ In case of inner single thread connection TBTA7 series can cover up to dia. 245.99mm












| Series | | Indexable deep drill & boring head | | Brazed deep drill head | |
|---------------------|---------------------|------------------------------------|------------------|------------------------|----------------|
| | | <i>TDEEP</i> | | | |
| | | TBTA-TR | TBTA-R | BTA-SE/DE | BTS-SE |
| Pages | | D127 - D130 | D121 - D126 | D131 - D133 | D134 |
| DC(mm) | | Ø16.00 - Ø40.00 | Ø25.00 - Ø110.99 | Ø12.60 - Ø65.00 | Ø8.00 - Ø20.00 |
| Drilling depth(L/D) | | 100 x Dc | 100 x Dc | 100 x Dc | 100 x Dc |
| Hole tolerance | | IT 10 | IT 7 - IT 9 | IT 9 | IT 9 |
| Surface finish | | 3µm | 1-2µm | 2µm | 2µm |
| Single tube | Outer four thread | ● | ● | ● | ●★ |
| | Inner single thread | ● | ● | | |
| Double tube | Outer four thread | ● | | ● | |

★ Two start thread: Diameter 12.60 to 15.59mm

● Recommended

Tool Selection Guide

Reaming tools

| Series | | | | Solid reamer | Indexable reamer | | |
|---------------------------|---------------------------|---|---|---|---|---------------|---|
| | | | | <i>TSREAM</i> | <i>TMREAM</i> | <i>TBREAM</i> | |
| | | | | TS | TM | TB | |
| | | | |  |  | |  |
| Pages | | | | D226 - D227 | D228 - D229 | | D230 - D232 |
| DC(mm) | | | | Ø3.000 - Ø12.000 | Ø11.501 - Ø32.000 | | Ø8.000 - Ø32.000 |
| Reaming depth(L/D) | | | | 7.5-10 x Dc | 3, 5, 8 x Dc | | 5-9 x Dc |
| Hole tolerance | | | | IT 7 | IT 7 ★ | | IT 6 ★★ |
| Application | | Through | Blind | | | | |
| | General reaming |  |  | ● | ● | ● | |
| | Cross hole reaming |  |  | ● | | ● | |
| | Irregular surface reaming |  |  | ● | | ● | |
| | Interrupted reaming |  |  | ● | ● | ● | |
| Coolant supply | | | | Internal | Internal | | Internal |











★ Up to IT 6 tolerance

★★ Up to IT 5 tolerance

● Recommended

Tool Selection Guide










Drill inserts

| | | TOPDRILL | | TDRILL | DRILLSPEED | DRILLRUSH | |
|--------------------|----------------------------|---|---|---|---|--|---|
| | | SOMT | SPMG / SPGG | 3ED-P+ | TCD-P/M/K/N | TCD-P+ | |
| Series | |  |  |  |  |  | |
| Pages | | D152 - D153 | D154 - D155 | D156 - D157 | D158 - D164 | D165 - D169 | |
| Size | | 04/05/06/07/08 09/11/13/15 | 05/06/07/09 11/12/14 | Ø15.0 - Ø20.9 | Ø6.0 - Ø25.9 | Ø6.0 - Ø25.9 | |
| Chip former | | DP, DK, DL, DA | DG, DK, DA | P+ | P/M/K/N | P+ | |
| Grades | | TT9080, TT9300 TT8020, TT6080 K10 | TT9030, TT8020 TT7400, TT6030 K10 | TT5130 | TT9080 UF10 | TT9080 | |
| Application | General drilling |  | ● | ● | ● | ● | ● |
| | Cross hole drilling |  | ● | ● | ● | ● | ● |
| | Irregular surface drilling |  | ○ | ○ | ○ | ○ | ○ |
| | Interrupted drilling |  | ○ | ○ | | | |
| | Chamfering |  | | | | | |

● Recommended, ○ Suitable

Tool Selection Guide

Drill inserts

| | | <i>DRILLRUSH</i> | | <i>MODURDRILL</i> | |
|--------------------|----------------------------|---|---|---|--|
| | | TCD-F | AOMT | TCD-P-CO+ | SPGX...DW |
| Series | |  |  |  |  |
| Pages | | D170 - D171 | D172 | D173 | D173 |
| Size | | Ø8.0 - Ø25.5 | 06 - C45 | Ø15.9 - Ø25.9 | 06/07/09/11/14 |
| Chip former | | F | - | P-CO+ | DW |
| Grades | | TT9080 | TT9080 | TT9080 | TT9080 |
| Application | General drilling |  | • | • | • |
| | Cross hole drilling |  | • | • | • |
| | Irregular surface drilling |  | ○ | ○ | ○ |
| | Interrupted drilling |  | | | |
| | Chamfering |  | | • | |

Tool Selection Guide










Drill inserts

| <i>SPADE</i> RUSH | | <i>DRILL</i> RUSH | <i>T</i> CHAMFER | <i>TOP</i> CAP |
|--|---|---|---|--|
| LCD-P | LCD-F | CRNG | XCGT | XCGT XCMT |
|  |  |  |  |  |
| D174 - D175 | D176 - D177 | D172 | D178 | D179 - D180 |
| Ø20.0 - Ø41.0 | Ø20.0 - Ø41.0 | 08 - 45CD | 06/09 | 04/05/06/07/08 10/13/17 |
| P | F | - | C30/C45/C60 | TA/GV/TC |
| TT9080 | TT9080 | TT9080 | TT9080 | TT9080, TT8020, TT9030, K10 |
| ● | | | | ● |
| ● | | | | |
| ○ | | | | |
| | | | | |
| | ● | | ● | |

● Recommended, ○ Suitable











Tool Selection Guide

Drill inserts

| | | <i>TDEEP</i> | | | |
|--------------------|----------------------------|---|---|---|--|
| | | NPHT NPMT | NPMX TPMX | TOGT | TPMX XPMT |
| Series | |  |  |  |  |
| Pages | | D181 - D183 | D184 | D185 | D186 |
| Size | | 06/07/08/09 /11/13 | 08/14/17/24/28 | 07/08/09/10/11 /12/13/14 | 14/16/17/24 |
| Chip former | | R(L)-G... /R(L)-HF... | R-B/R-G | RS/GF | LG/-45 |
| Grades | | TT9030, TT9130, TT8125, TT6130, TT5030 | TT9030, TT9130, TT8125, TT7200, TT6130, TT6020, TT5100, TT5030 | TT9030 | TT9030, TT9130, TT6020, TT5100 |
| Application | General drilling |  | ● | ● | ● |
| | Cross hole drilling |  | ○ | ○ | ○ |
| | Irregular surface drilling |  | | | |
| | Interrupted drilling |  | | | |
| | Chamfering |  | | | |

Tool Selection Guide

Reamer heads & blades

| | | | <i>TM</i> REAM | <i>TB</i> REAM | |
|-------------|---------------------------|---|--|--|---|
| Series | | | TM  | TB  | |
| Pages | | | D233 - D234 | D235 | |
| Size | | | Ø11.501 - Ø32.000 | 1/2/3/4 | |
| Chip former | | | BL/AS | A06/B06/B12 | |
| Grades | | | TT9030 | TT5030, TT5050 | |
| Application | | Through | Blind | | |
| | General reaming |  |  | ● | ● |
| | Cross hole reaming |  |  | | |
| | Irregular surface reaming |  |  | | |
| | Interrupted reaming |  |  | | |

● Recommended, ○ Suitable

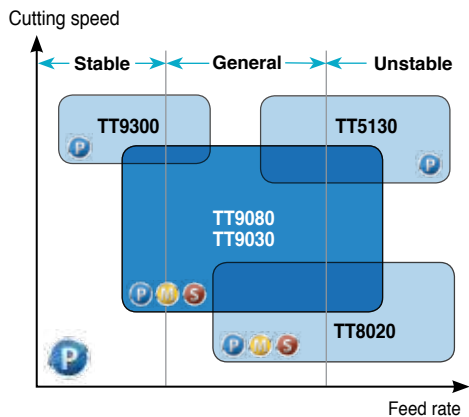
Grades

Holemaking grades

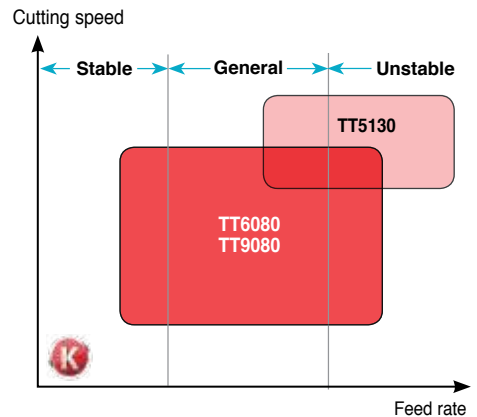
| Grades | ISO | Characteristics & applications |
|------------------------------|---|---|
| TT6080 PVD carbide | K05 – K25 H05 – H25 | <ul style="list-style-type: none"> • General machining for gray and ductile cast iron • Finish and medium machining of hardened steel |
| TT9300 CVD carbide | P10 – P25 | <ul style="list-style-type: none"> • High speed drilling of carbon & alloy steel |
| TT5130 PVD carbide | P20 – P40 K20 – K40 | <ul style="list-style-type: none"> • High speed drilling of carbon & alloy steel |
| TT9080 PVD carbide | P20 – P40 M20 – M40 S20 – S40 | <ul style="list-style-type: none"> • General machining of steel • General machining of stainless steel • General machining of heat-resistant alloy |
| TT9030 PVD carbide | P20 – P40 M20 – M40 S20 – S40 | <ul style="list-style-type: none"> • General machining of steel • General machining of stainless steel • General machining of heat-resistant alloy |
| TT8020 PVD carbide | P30 – P50 M30 – M50 S30 – S50 | <ul style="list-style-type: none"> • Interrupted and rough machining of steel • Interrupted and rough machining of stainless steel • Low speed and interrupted machining of heat-resistant alloy |
| K10 Uncoated | K05 – K15 N05 – N15 S05 – S15 | <ul style="list-style-type: none"> • General machining of cast iron • General machining of aluminum alloys and non-ferrous materials • General machining of heat-resistant alloy |
| UF1A/UF10 Uncoated | N10 – N25 S10 – S30 | <ul style="list-style-type: none"> • General machining of aluminum alloys and non-ferrous materials • General machining of heat-resistant alloy |

Selection guide for holemaking grades

For steel



For cast iron



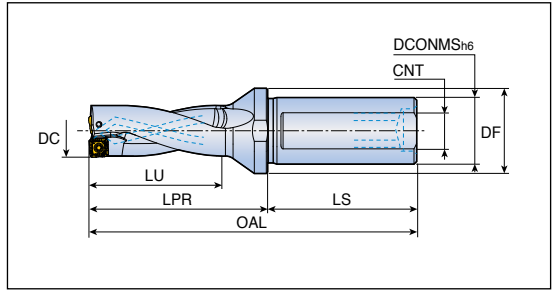
Drilling Tools



Indexable drill holders



- Drilling depth: 2x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|----|-----|----|---------|-----------------------------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TOP 2120-20T2-04 | 12.0 | 20 | 25 | 24 | 44 | 50 | M13X1.0 | SOMT 04...DP |
| 2125-20T2-04 | 12.5 | 20 | 25 | 26 | 46 | 50 | M13X1.0 | D152 |
| 2130-20T2-04 | 13.0 | 20 | 25 | 26 | 46 | 50 | M13X1.0 | |
| 2135-20T2-04 | 13.5 | 20 | 25 | 28 | 46 | 50 | M13X1.0 | SOMT 05...DP/DL/DK/DA D152-153 |
| 2140-20T2-05 | 14.0 | 20 | 25 | 28 | 46 | 50 | M13X1.0 | |
| 2145-20T2-05 | 14.5 | 20 | 25 | 30 | 49 | 50 | M13X1.0 | |
| 2150-20T2-05 | 15.0 | 20 | 25 | 30 | 49 | 50 | M13X1.0 | |
| 2155-20T2-05 | 15.5 | 20 | 25 | 32 | 52 | 50 | M13X1.0 | |
| 2160-20T2-05 | 16.0 | 20 | 25 | 32 | 52 | 50 | M13X1.0 | SOMT 06...DP/DL/DK/DA D152-153 |
| 2165-25T2-06 | 16.5 | 25 | 32 | 34 | 54 | 56 | M16X1.5 | |
| 2170-25T2-06 | 17.0 | 25 | 32 | 34 | 54 | 56 | M16X1.5 | |
| 2175-25T2-06 | 17.5 | 25 | 32 | 36 | 57 | 56 | M16X1.5 | |
| 2180-25T2-06 | 18.0 | 25 | 32 | 36 | 57 | 56 | M16X1.5 | |
| 2185-25T2-06 | 18.5 | 25 | 32 | 38 | 59 | 56 | M16X1.5 | |
| 2190-25T2-06 | 19.0 | 25 | 32 | 38 | 59 | 56 | M16X1.5 | |
| 2195-25T2-07 | 19.5 | 25 | 32 | 40 | 63 | 56 | M16X1.5 | SOMT 07...DP/DL/DK/DA D152-153 |
| 2200-25T2-07 | 20.0 | 25 | 32 | 40 | 63 | 56 | M16X1.5 | |
| 2205-25T2-07 | 20.5 | 25 | 32 | 42 | 65 | 56 | M16X1.5 | |
| 2210-25T2-07 | 21.0 | 25 | 32 | 42 | 65 | 56 | M16X1.5 | |
| 2215-25T2-07 | 21.5 | 25 | 32 | 44 | 67 | 56 | M16X1.5 | |
| 2220-25T2-07 | 22.0 | 25 | 32 | 44 | 67 | 56 | M16X1.5 | |
| 2225-25T2-08 | 22.5 | 25 | 32 | 46 | 68 | 56 | M16X1.5 | |
| 2230-25T2-08 | 23.0 | 25 | 32 | 46 | 68 | 56 | M16X1.5 | |
| 2230-32T2-08 | 23.0 | 32 | 40 | 46 | 68 | 60 | M22X2.0 | |
| 2235-25T2-08 | 23.5 | 25 | 32 | 48 | 70 | 56 | M16X1.5 | |
| 2235-32T2-08 | 23.5 | 32 | 40 | 48 | 70 | 60 | M22X2.0 | |
| 2240-25T2-08 | 24.0 | 25 | 32 | 48 | 70 | 56 | M16X1.5 | SOMT 08...DP/DL/DK/DA D152-153 |
| 2240-32T2-08 | 24.0 | 32 | 40 | 48 | 70 | 60 | M22X2.0 | |
| 2245-25T2-08 | 24.5 | 25 | 32 | 50 | 72 | 56 | M16X1.5 | |
| 2245-32T2-08 | 24.5 | 32 | 40 | 50 | 72 | 60 | M22X2.0 | |
| 2250-25T2-08 | 25.0 | 25 | 32 | 50 | 72 | 56 | M16X1.5 | |
| 2250-32T2-08 | 25.0 | 32 | 40 | 50 | 72 | 60 | M22X2.0 | |
| 2255-25T2-08 | 25.5 | 25 | 32 | 52 | 73 | 56 | M16X1.5 | |
| 2255-32T2-08 | 25.5 | 32 | 40 | 52 | 73 | 60 | M22X2.0 | |
| 2260-25T2-08 | 26.0 | 25 | 32 | 52 | 73 | 56 | M16X1.5 | |
| 2260-32T2-08 | 26.0 | 32 | 40 | 52 | 73 | 60 | M22X2.0 | |

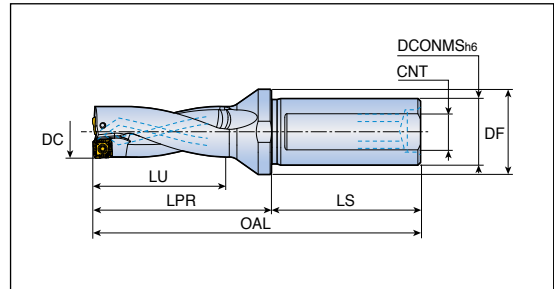
- OAL = LPR + LS



Indexable drill holders



- Drilling depth: 2xdiameter



| Designation | Dimension (mm) | | | | | | | Insert | |
|-------------------------|----------------|--------|----|----|-----|----|---------|-----------------------------------|-----------------------------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | | |
| TOP 2265-32T2-09 | 26.5 | 32 | 40 | 54 | 77 | 60 | M22X2.0 | SOMT 09...DP/DL/DK/DA D152-153 | |
| 2270-25T2-09 | 27.0 | 25 | 40 | 54 | 77 | 56 | M16X1.5 | | |
| 2270-32T2-09 | 27.0 | 32 | 40 | 54 | 77 | 60 | M22X2.0 | | |
| 2275-32T2-09 | 27.5 | 32 | 40 | 56 | 79 | 60 | M22X2.0 | | |
| 2280-25T2-09 | 28.0 | 25 | 40 | 56 | 79 | 56 | M16X1.5 | | |
| 2280-32T2-09 | 28.0 | 32 | 40 | 56 | 79 | 60 | M22X2.0 | | |
| 2285-32T2-09 | 28.5 | 32 | 40 | 58 | 81 | 60 | M22X2.0 | | |
| 2290-25T2-09 | 29.0 | 25 | 40 | 58 | 81 | 56 | M16X1.5 | | |
| 2290-32T2-09 | 29.0 | 32 | 40 | 58 | 81 | 60 | M22X2.0 | | |
| 2295-32T2-09 | 29.5 | 32 | 40 | 60 | 83 | 60 | M22X2.0 | | |
| 2300-32T2-09 | 30.0 | 32 | 40 | 60 | 83 | 60 | M22X2.0 | | |
| 2305-32T2-09 | 30.5 | 32 | 40 | 62 | 85 | 60 | M22X2.0 | | |
| 2310-32T2-09 | 31.0 | 32 | 40 | 62 | 85 | 60 | M22X2.0 | SOMT 11...DP/DL/DK/DA D152-153 | |
| 2320-32T2-11 | 32.0 | 32 | 40 | 64 | 87 | 60 | M22X2.0 | | |
| 2320-40T2-11 | 32.0 | 40 | 50 | 64 | 87 | 70 | M30X2.0 | | |
| 2330-32T2-11 | 33.0 | 32 | 40 | 66 | 89 | 60 | M22X2.0 | | |
| 2330-40T2-11 | 33.0 | 40 | 50 | 66 | 89 | 70 | M30X2.0 | | |
| 2340-32T2-11 | 34.0 | 32 | 40 | 68 | 91 | 60 | M22X2.0 | | |
| 2340-40T2-11 | 34.0 | 40 | 50 | 68 | 91 | 70 | M30X2.0 | | |
| 2350-32T2-11 | 35.0 | 32 | 40 | 70 | 93 | 60 | M22X2.0 | | |
| 2350-40T2-11 | 35.0 | 40 | 50 | 70 | 93 | 70 | M30X2.0 | | |
| 2360-32T2-11 | 36.0 | 32 | 40 | 72 | 95 | 60 | M22X2.0 | | |
| 2360-40T2-11 | 36.0 | 40 | 50 | 72 | 95 | 70 | M30X2.0 | | SOMT 13...DP/DL/DK/DA D152-153 |
| 2370-32T2-13 | 37.0 | 32 | 50 | 74 | 102 | 60 | M22X2.0 | | |
| 2370-40T2-13 | 37.0 | 40 | 50 | 74 | 102 | 70 | M30X2.0 | | |
| 2380-32T2-13 | 38.0 | 32 | 50 | 76 | 104 | 60 | M22X2.0 | | |
| 2380-40T2-13 | 38.0 | 40 | 50 | 76 | 104 | 70 | M30X2.0 | | |
| 2390-32T2-13 | 39.0 | 32 | 50 | 78 | 106 | 60 | M22X2.0 | | |
| 2390-40T2-13 | 39.0 | 40 | 50 | 78 | 106 | 70 | M30X2.0 | | |
| 2400-32T2-13 | 40.0 | 32 | 50 | 80 | 108 | 60 | M22X2.0 | | |
| 2400-40T2-13 | 40.0 | 40 | 50 | 80 | 108 | 70 | M30X2.0 | | |
| 2410-40T2-13 | 41.0 | 40 | 50 | 82 | 110 | 70 | M30X2.0 | | |
| 2420-40T2-13 | 42.0 | 40 | 50 | 84 | 112 | 70 | M30X2.0 | | |
| 2430-40T2-13 | 43.0 | 40 | 50 | 86 | 114 | 70 | M30X2.0 | | |

- OAL = LPR+LS

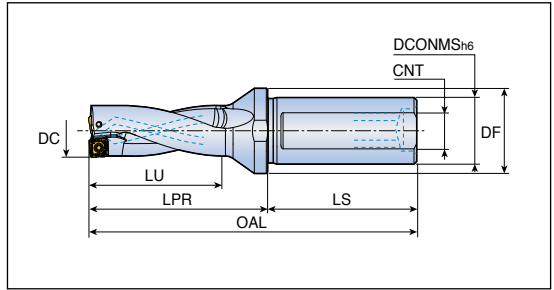


TOP 2...-T2

Indexable drill holders



- Drilling depth: 2x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-----------------------------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TOP 2440-40T2-15 | 44.0 | 40 | 60 | 88 | 123 | 70 | M30X2.0 | SOMT 15...DP/DL/DK/DA D152-153 |
| 2450-40T2-15 | 45.0 | 40 | 60 | 90 | 125 | 70 | M30X2.0 | |
| 2460-40T2-15 | 46.0 | 40 | 60 | 92 | 127 | 70 | M30X2.0 | |
| 2470-40T2-15 | 47.0 | 40 | 60 | 94 | 129 | 70 | M30X2.0 | |
| 2480-40T2-15 | 48.0 | 40 | 60 | 96 | 131 | 70 | M30X2.0 | |
| 2490-40T2-15 | 49.0 | 40 | 60 | 98 | 133 | 70 | M30X2.0 | |
| 2500-40T2-15 | 50.0 | 40 | 60 | 100 | 135 | 70 | M30X2.0 | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

- OAL = LPR+LS

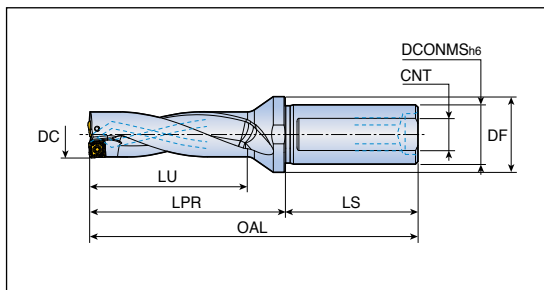
Spare parts

| Designation | Screw | Wrench | Plug* | |
|------------------------|---------------|--------|--------------------------|--|
| | | | | |
| TOP 2120 - 2135 | TS 18041/HG | TD 6P | SL 20M | |
| TOP 2140 - 2160 | TS 20043/HG-P | TD 6P | SL 20M | |
| TOP 2165 - 2220 | TS 22052/HG-P | TD 7P | SL 25M | |
| TOP 2225 - 2260 | SO 25065I | TD 7 | SL 25M / SL 32M | |
| TOP 2265 - 2360 | TS 35088I | TD 10 | SL 25M / SL 32M / SL 40M | |
| TOP 2370 - 2430 | TS 40093I | TD 15 | SL 32M / SL 40M | |
| TOP 2440 - 2550 | TS 50115I | TD 20 | SL 40M | |



- *Notice: Cooling hole plug for lathe should be ordered separately
Order example) Plug for shank diameter 25.0mm : SL 25M

Indexable drill holders



- Drilling depth: 3x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|----|-----|----|---------|-----------------------------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TOP 3120-20T2-04 | 12.0 | 20 | 25 | 36 | 56 | 50 | M13X1.0 | SOMT 04...DP |
| 3125-20T2-04 | 12.5 | 20 | 25 | 39 | 59 | 50 | M13X1.0 | D152-153 |
| 3130-20T2-04 | 13.0 | 20 | 25 | 39 | 59 | 50 | M13X1.0 | |
| 3135-20T2-04 | 13.5 | 20 | 25 | 42 | 60 | 50 | M13X1.0 | SOMT 05...DP/DL/DK/DA D152-153 |
| 3140-20T2-05 | 14.0 | 20 | 25 | 42 | 60 | 50 | M13X1.0 | |
| 3145-20T2-05 | 14.5 | 20 | 25 | 45 | 64 | 50 | M13X1.0 | |
| 3150-20T2-05 | 15.0 | 20 | 25 | 45 | 64 | 50 | M13X1.0 | |
| 3155-20T2-05 | 15.5 | 20 | 25 | 48 | 68 | 50 | M13X1.0 | |
| 3160-20T2-05 | 16.0 | 20 | 25 | 48 | 68 | 50 | M13X1.0 | |
| 3165-25T2-06 | 16.5 | 25 | 32 | 51 | 71 | 56 | M16X1.5 | SOMT 06...DP/DL/DK/DA D152-153 |
| 3167-25T2-06 * | 16.7 | 25 | 32 | 51 | 71 | 56 | M16X1.5 | |
| 3170-25T2-06 | 17.0 | 25 | 32 | 51 | 71 | 56 | M16X1.5 | |
| 3175-25T2-06 | 17.5 | 25 | 32 | 54 | 75 | 56 | M16X1.5 | |
| 3180-25T2-06 | 18.0 | 25 | 32 | 54 | 75 | 56 | M16X1.5 | |
| 3185-25T2-06 | 18.5 | 25 | 32 | 57 | 78 | 56 | M16X1.5 | |
| 3190-25T2-06 | 19.0 | 25 | 32 | 57 | 78 | 56 | M16X1.5 | |
| 3195-25T2-07 | 19.5 | 25 | 32 | 60 | 83 | 56 | M16X1.5 | SOMT 07...DP/DL/DK/DA D152-153 |
| 3200-25T2-07 | 20.0 | 25 | 32 | 60 | 83 | 56 | M16X1.5 | |
| 3205-25T2-07 | 20.5 | 25 | 32 | 63 | 86 | 56 | M16X1.5 | |
| 3210-25T2-07 | 21.0 | 25 | 32 | 63 | 86 | 56 | M16X1.5 | |
| 3215-25T2-07 | 21.5 | 25 | 32 | 66 | 89 | 56 | M16X1.5 | |
| 3220-25T2-07 | 22.0 | 25 | 32 | 66 | 89 | 56 | M16X1.5 | |
| 3222-25T2-07 * | 22.2 | 25 | 32 | 66 | 89 | 56 | M16X1.5 | |
| 3225-25T2-08 | 22.5 | 25 | 32 | 69 | 91 | 56 | M16X1.5 | |
| 3230-25T2-08 | 23.0 | 25 | 32 | 69 | 91 | 56 | M16X1.5 | |
| 3230-32T2-08 | 23.0 | 32 | 40 | 69 | 91 | 60 | M22X2.0 | |
| 3235-25T2-08 | 23.5 | 25 | 32 | 72 | 94 | 56 | M16X1.5 | |
| 3235-32T2-08 | 23.5 | 32 | 40 | 72 | 94 | 60 | M22X2.0 | |
| 3240-25T2-08 | 24.0 | 25 | 32 | 72 | 94 | 56 | M16X1.5 | |
| 3240-32T2-08 | 24.0 | 32 | 40 | 72 | 94 | 60 | M22X2.0 | |
| 3245-25T2-08 | 24.5 | 25 | 32 | 75 | 97 | 56 | M16X1.5 | |
| 3245-32T2-08 | 24.5 | 32 | 40 | 75 | 97 | 60 | M22X2.0 | |
| 3250-25T2-08 | 25.0 | 25 | 32 | 75 | 97 | 56 | M16X1.5 | |
| 3250-32T2-08 | 25.0 | 32 | 40 | 75 | 97 | 60 | M22X2.0 | |
| 3254-25T2-08 * | 25.4 | 25 | 32 | 75 | 97 | 56 | M16X1.5 | |

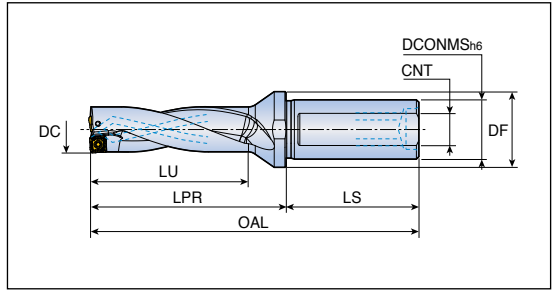


- *! Marked items are for inch sized hole
- OAL = LPR+LS

Indexable drill holders



• Drilling depth: 3x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-----------------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TOP 3255-25T2-08 | 25.5 | 25 | 32 | 78 | 99 | 56 | M16X1.5 | SOMT 08...DP/DL/DK/DA |
| 3255-32T2-08 | 25.5 | 32 | 40 | 78 | 99 | 60 | M22X2.0 | D152-153 |
| 3260-25T2-08 | 26.0 | 25 | 32 | 78 | 99 | 56 | M16X1.5 | |
| 3260-32T2-08 | 26.0 | 32 | 32 | 78 | 99 | 60 | M22X2.0 | |
| 3265-25T2-09 | 26.5 | 25 | 40 | 81 | 104 | 56 | M16X1.5 | SOMT 09...DP/DL/DK/DA |
| 3265-32T2-09 | 26.5 | 32 | 40 | 81 | 104 | 60 | M22X2.0 | D152-153 |
| 3270-25T2-09 | 27.0 | 25 | 40 | 81 | 104 | 56 | M16X1.5 | |
| 3270-32T2-09 | 27.0 | 32 | 40 | 81 | 104 | 60 | M22X2.0 | |
| 3275-25T2-09 | 27.5 | 25 | 40 | 84 | 107 | 56 | M16X1.5 | |
| 3275-32T2-09 | 27.5 | 32 | 40 | 84 | 107 | 60 | M22X2.0 | |
| 3280-25T2-09 | 28.0 | 25 | 40 | 84 | 107 | 56 | M16X1.5 | |
| 3280-32T2-09 | 28.0 | 32 | 40 | 84 | 107 | 60 | M22X2.0 | |
| 3285-25T2-09 | 28.5 | 25 | 40 | 87 | 110 | 56 | M16X1.5 | |
| 3285-32T2-09 | 28.5 | 32 | 40 | 87 | 110 | 60 | M22X2.0 | |
| 3290-25T2-09 | 29.0 | 25 | 40 | 87 | 110 | 56 | M16X1.5 | |
| 3290-32T2-09 | 29.0 | 32 | 40 | 87 | 110 | 60 | M22X2.0 | |
| 3295-32T2-09 | 29.5 | 32 | 40 | 90 | 113 | 60 | M22X2.0 | |
| 3300-32T2-09 | 30.0 | 32 | 40 | 90 | 113 | 60 | M22X2.0 | |
| 3305-32T2-09 | 30.5 | 32 | 40 | 93 | 116 | 60 | M22X2.0 | |
| 3310-32T2-09 | 31.0 | 32 | 40 | 93 | 116 | 60 | M22X2.0 | |
| 3320-32T2-11 | 32.0 | 32 | 40 | 96 | 119 | 60 | M22X2.0 | SOMT 11...DP/DL/DK/DA |
| 3320-40T2-11 | 32.0 | 40 | 50 | 96 | 119 | 70 | M30X2.0 | D152-153 |
| 3330-32T2-11 | 33.0 | 32 | 40 | 99 | 122 | 60 | M22X2.0 | |
| 3330-40T2-11 | 33.0 | 40 | 50 | 99 | 122 | 70 | M30X2.0 | |
| 3340-32T2-11 | 34.0 | 32 | 40 | 102 | 125 | 60 | M22X2.0 | |
| 3340-40T2-11 | 34.0 | 40 | 50 | 102 | 125 | 70 | M30X2.0 | |
| 3350-32T2-11 | 35.0 | 32 | 40 | 105 | 128 | 60 | M22X2.0 | |
| 3350-40T2-11 | 35.0 | 40 | 50 | 105 | 128 | 70 | M30X2.0 | |
| 3360-32T2-11 | 36.0 | 32 | 40 | 108 | 131 | 60 | M22X2.0 | |
| 3360-40T2-11 | 36.0 | 40 | 50 | 108 | 131 | 70 | M30X2.0 | |
| 3370-32T2-13 | 37.0 | 32 | 50 | 111 | 139 | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA |
| 3370-40T2-13 | 37.0 | 40 | 50 | 111 | 139 | 70 | M30X2.0 | D152-153 |
| 3380-32T2-13 | 38.0 | 32 | 50 | 114 | 142 | 60 | M22X2.0 | |
| 3380-40T2-13 | 38.0 | 40 | 50 | 114 | 142 | 70 | M30X2.0 | |
| 3390-32T2-13 | 39.0 | 32 | 50 | 117 | 145 | 60 | M22X2.0 | |

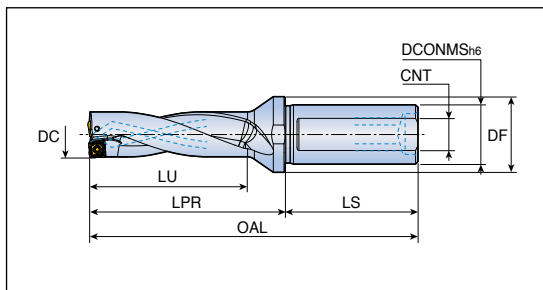
• OAL = LPR + LS



Indexable drill holders



- Drilling depth: 3xdiameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-----------------------------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TOP 3390-40T2-13 | 39.0 | 40 | 50 | 117 | 145 | 70 | M30X2.0 | SOMT 13...DP/DL/DK/DA D152-153 |
| 3400-32T2-13 | 40.0 | 32 | 50 | 120 | 148 | 60 | M22X2.0 | |
| 3400-40T2-13 | 40.0 | 40 | 50 | 120 | 148 | 70 | M30X2.0 | |
| 3410-40T2-13 | 41.0 | 40 | 50 | 123 | 151 | 70 | M30X2.0 | |
| 3420-40T2-13 | 42.0 | 40 | 50 | 126 | 154 | 70 | M30X2.0 | |
| 3430-40T2-13 | 43.0 | 40 | 50 | 129 | 157 | 70 | M30X2.0 | |
| 3440-40T2-15 | 44.0 | 40 | 60 | 132 | 167 | 70 | M30X2.0 | SOMT 15...DP/DL/DK/DA D152-153 |
| 3450-40T2-15 | 45.0 | 40 | 60 | 135 | 170 | 70 | M30X2.0 | |
| 3460-40T2-15 | 46.0 | 40 | 60 | 138 | 173 | 70 | M30X2.0 | |
| 3470-40T2-15 | 47.0 | 40 | 60 | 141 | 176 | 70 | M30X2.0 | |
| 3480-40T2-15 | 48.0 | 40 | 60 | 144 | 179 | 70 | M30X2.0 | |
| 3490-40T2-15 | 49.0 | 40 | 60 | 147 | 182 | 70 | M30X2.0 | |
| 3500-40T2-15 | 50.0 | 40 | 60 | 150 | 185 | 70 | M30X2.0 | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

- OAL = LPR+LS

Spare parts

| Designation | Screw | Wrench | Plug* | |
|------------------------|----------------|--------|--------------------------|--|
| | | | | |
| TOP 3120 - 3135 | TS 18041/HG | TD 6P | SL 20M | |
| TOP 3140 - 3160 | TS 20043I/HG-P | TD 6P | SL 20M | |
| TOP 3165 - 3220 | TS 22052I/HG-P | TD 7P | SL 25M | |
| TOP 3225 - 3260 | SO 25065I | TD 7 | SL 25M / SL 32M | |
| TOP 3265 - 3360 | TS 35088I | TD 10 | SL 25M / SL 32M / SL 40M | |
| TOP 3370 - 3430 | TS 40093I | TD 15 | SL 32M / SL 40M | |
| TOP 3440 - 3500 | TS 50115I | TD 20 | SL 40M | |

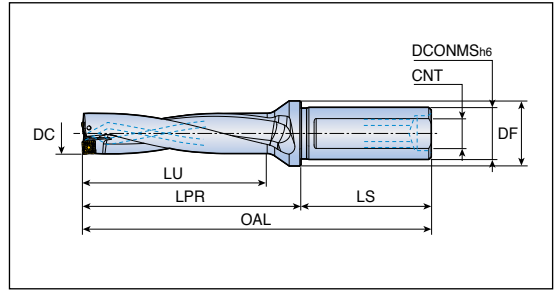
- *Notice: Cooling hole plug for lathe should be ordered separately
Order example) Plug for shank diameter 25.0mm : SL 25M



Indexable drill holders



- Drilling depth: 4x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-----------------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TOP 4120-20T2-04 | 12.0 | 20 | 25 | 48 | 68 | 50 | M13X1.0 | SOMT 04...DP |
| 4125-20T2-04 | 12.5 | 20 | 25 | 52 | 72 | 50 | M13X1.0 | D152 |
| 4130-20T2-04 | 13.0 | 20 | 25 | 52 | 72 | 50 | M13X1.0 | |
| 4135-20T2-04 | 13.5 | 20 | 25 | 56 | 74 | 50 | M13X1.0 | |
| 4140-20T2-05 | 14.0 | 20 | 25 | 56 | 74 | 50 | M13X1.0 | SOMT 05...DP/DL/DK/DA |
| 4145-20T2-05 | 14.5 | 20 | 25 | 60 | 79 | 50 | M13X1.0 | D152-153 |
| 4150-20T2-05 | 15.0 | 20 | 25 | 60 | 79 | 50 | M13X1.0 | |
| 4155-20T2-05 | 15.5 | 20 | 25 | 64 | 84 | 50 | M13X1.0 | |
| 4160-20T2-05 | 16.0 | 20 | 25 | 64 | 84 | 50 | M13X1.0 | |
| 4165-25T2-06 | 16.5 | 25 | 32 | 68 | 88 | 56 | M16X1.5 | SOMT 06...DP/DL/DK/DA |
| 4170-25T2-06 | 17.0 | 25 | 32 | 68 | 88 | 56 | M16X1.5 | D152-153 |
| 4175-25T2-06 | 17.5 | 25 | 32 | 72 | 93 | 56 | M16X1.5 | |
| 4180-25T2-06 | 18.0 | 25 | 32 | 72 | 93 | 56 | M16X1.5 | |
| 4185-25T2-06 | 18.5 | 25 | 32 | 76 | 97 | 56 | M16X1.5 | |
| 4190-25T2-06 | 19.0 | 25 | 32 | 76 | 97 | 56 | M16X1.5 | |
| 4195-25T2-07 | 19.5 | 25 | 32 | 80 | 103 | 56 | M16X1.5 | SOMT 07...DP/DL/DK/DA |
| 4200-25T2-07 | 20.0 | 25 | 32 | 80 | 103 | 56 | M16X1.5 | D152-153 |
| 4205-25T2-07 | 20.5 | 25 | 32 | 84 | 107 | 56 | M16X1.5 | |
| 4210-25T2-07 | 21.0 | 25 | 32 | 84 | 107 | 56 | M16X1.5 | |
| 4215-25T2-07 | 21.5 | 25 | 32 | 88 | 111 | 56 | M16X1.5 | |
| 4220-25T2-07 | 22.0 | 25 | 32 | 88 | 111 | 56 | M16X1.5 | |
| 4225-25T2-08 | 22.5 | 25 | 32 | 92 | 114 | 56 | M16X1.5 | SOMT 08...DP/DL/DK/DA |
| 4230-25T2-08 | 23.0 | 25 | 32 | 92 | 114 | 56 | M16X1.5 | D152-153 |
| 4230-32T2-08 | 23.0 | 32 | 40 | 92 | 114 | 60 | M22X2.0 | |
| 4235-25T2-08 | 23.5 | 25 | 32 | 96 | 118 | 56 | M16X1.5 | |
| 4235-32T2-08 | 23.5 | 32 | 40 | 96 | 118 | 60 | M22X2.0 | |
| 4240-25T2-08 | 24.0 | 25 | 32 | 96 | 118 | 56 | M16X1.5 | |
| 4240-32T2-08 | 24.0 | 32 | 40 | 96 | 118 | 60 | M22X2.0 | |
| 4245-25T2-08 | 24.5 | 25 | 32 | 100 | 122 | 56 | M16X1.5 | |
| 4245-32T2-08 | 24.5 | 32 | 40 | 100 | 122 | 60 | M22X2.0 | |
| 4250-25T2-08 | 25.0 | 25 | 32 | 100 | 122 | 56 | M16X1.5 | |
| 4250-32T2-08 | 25.0 | 32 | 40 | 100 | 122 | 60 | M22X2.0 | |
| 4254-25T2-08 * | 25.4 | 25 | 32 | 100 | 122 | 56 | M16X1.5 | |
| 4255-25T2-08 | 25.5 | 25 | 32 | 104 | 125 | 56 | M16X1.5 | |
| 4255-32T2-08 | 25.5 | 32 | 40 | 104 | 125 | 60 | M22X2.0 | |

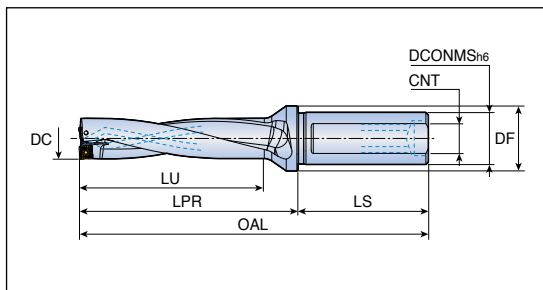


- *' Marked items are for inch sized hole
- OAL = LPR+LS

Indexable drill holders



- Drilling depth: 4xdiameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-----------------------------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TOP 4260-25T2-08 | 26.0 | 25 | 32 | 104 | 125 | 56 | M16X1.5 | SOMT 08...DP/DL/DK/DA D152-153 |
| 4260-32T2-08 | 26.0 | 32 | 40 | 104 | 125 | 60 | M22X2.0 | |
| 4265-25T2-09 | 26.5 | 25 | 40 | 108 | 131 | 56 | M16X1.5 | SOMT 09...DP/DL/DK/DA D152-153 |
| 4265-32T2-09 | 26.5 | 32 | 40 | 108 | 131 | 60 | M22X2.0 | |
| 4270-25T2-09 | 27.0 | 25 | 40 | 108 | 131 | 56 | M16X1.5 | SOMT 11...DP/DL/DK/DA D152-153 |
| 4270-32T2-09 | 27.0 | 32 | 40 | 108 | 131 | 60 | M22X2.0 | |
| 4275-25T2-09 | 27.5 | 25 | 40 | 112 | 135 | 56 | M16X1.5 | |
| 4275-32T2-09 | 27.5 | 32 | 40 | 112 | 135 | 60 | M22X2.0 | |
| 4280-25T2-09 | 28.0 | 25 | 40 | 112 | 135 | 56 | M16X1.5 | |
| 4280-32T2-09 | 28.0 | 32 | 40 | 112 | 135 | 60 | M22X2.0 | |
| 4285-25T2-09 | 28.5 | 25 | 40 | 116 | 139 | 56 | M16X1.5 | |
| 4285-32T2-09 | 28.5 | 32 | 40 | 116 | 139 | 60 | M22X2.0 | |
| 4286-32T2-09 * | 28.6 | 32 | 40 | 116 | 139 | 60 | M22X2.0 | |
| 4290-25T2-09 | 29.0 | 25 | 40 | 116 | 139 | 56 | M16X1.5 | |
| 4290-32T2-09 | 29.0 | 32 | 40 | 116 | 139 | 60 | M22X2.0 | |
| 4295-32T2-09 | 29.5 | 32 | 40 | 120 | 143 | 60 | M22X2.0 | |
| 4300-32T2-09 | 30.0 | 32 | 40 | 120 | 143 | 60 | M22X2.0 | |
| 4305-32T2-09 | 30.5 | 32 | 40 | 124 | 147 | 60 | M22X2.0 | |
| 4310-32T2-09 | 31.0 | 32 | 40 | 124 | 147 | 60 | M22X2.0 | |
| 4318-32T2-11 * | 31.8 | 32 | 40 | 128 | 151 | 60 | M22X2.0 | |
| 4320-32T2-11 | 32.0 | 32 | 40 | 128 | 151 | 60 | M22X2.0 | |
| 4320-40T2-11 | 32.0 | 40 | 50 | 128 | 151 | 70 | M30X2.0 | |
| 4330-32T2-11 | 33.0 | 32 | 40 | 132 | 155 | 60 | M22X2.0 | |
| 4330-40T2-11 | 33.0 | 40 | 50 | 132 | 155 | 70 | M30X2.0 | |
| 4340-32T2-11 | 34.0 | 32 | 40 | 136 | 159 | 60 | M22X2.0 | |
| 4340-40T2-11 | 34.0 | 40 | 50 | 136 | 159 | 70 | M30X2.0 | |
| 4349-40T2-11 * | 34.9 | 40 | 50 | 140 | 163 | 70 | M30X2.0 | |
| 4350-32T2-11 | 35.0 | 32 | 40 | 140 | 163 | 60 | M22X2.0 | |
| 4350-40T2-11 | 35.0 | 40 | 50 | 140 | 163 | 70 | M30X2.0 | |
| 4360-32T2-11 | 36.0 | 32 | 40 | 144 | 167 | 60 | M22X2.0 | |
| 4360-40T2-11 | 36.0 | 40 | 50 | 144 | 167 | 70 | M30X2.0 | |
| 4370-32T2-13 | 37.0 | 32 | 50 | 148 | 176 | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA D152-153 |
| 4370-40T2-13 | 37.0 | 40 | 50 | 148 | 176 | 70 | M30X2.0 | |
| 4371-40T2-13 * | 37.1 | 40 | 50 | 148 | 176 | 70 | M30X2.0 | |

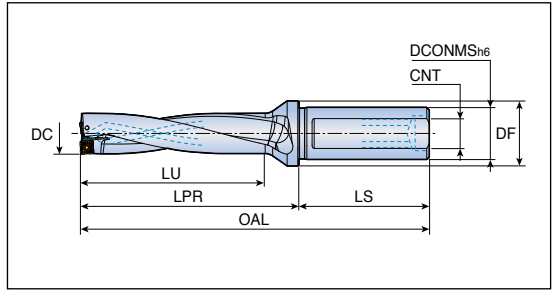


- '* *' Marked items are for inch sized hole
- OAL = LPR+LS

Indexable drill holders



- Drilling depth: 4x diameter



| Designation | Dimension (mm) | | | | | | | Insert | |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-----------------------------------|-----------------------------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | | |
| TOP 4380-32T2-13 | 38.0 | 32 | 50 | 152 | 180 | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA D152-153 | |
| 4380-40T2-13 | 38.0 | 40 | 50 | 152 | 180 | 70 | M30X2.0 | | |
| 4381-40T2-13 * | 38.1 | 40 | 50 | 152 | 180 | 70 | M30X2.0 | | |
| 4390-32T2-13 | 39.0 | 32 | 50 | 156 | 184 | 60 | M22X2.0 | | |
| 4390-40T2-13 | 39.0 | 40 | 50 | 156 | 184 | 70 | M30X2.0 | | |
| 4400-32T2-13 | 40.0 | 32 | 50 | 160 | 188 | 60 | M22X2.0 | | |
| 4400-40T2-13 | 40.0 | 40 | 50 | 160 | 188 | 70 | M30X2.0 | | |
| 4410-40T2-13 | 41.0 | 40 | 50 | 164 | 192 | 70 | M30X2.0 | | |
| 4413-40T2-13 * | 41.3 | 40 | 50 | 164 | 192 | 70 | M30X2.0 | | |
| 4420-40T2-13 | 42.0 | 40 | 50 | 168 | 196 | 70 | M30X2.0 | | |
| 4429-40T2-13 * | 42.9 | 40 | 50 | 172 | 200 | 70 | M30X2.0 | | |
| 4430-40T2-13 | 43.0 | 40 | 50 | 172 | 200 | 70 | M30X2.0 | | |
| 4440-40T2-15 | 44.0 | 40 | 60 | 176 | 211 | 70 | M30X2.0 | | SOMT 15...DP/DL/DK/DA D152-153 |
| 4445-40T2-15 * | 44.5 | 40 | 60 | 180 | 215 | 70 | M30X2.0 | | |
| 4450-40T2-15 | 45.0 | 40 | 60 | 180 | 215 | 70 | M30X2.0 | | |
| 4460-40T2-15 | 46.0 | 40 | 60 | 184 | 219 | 70 | M30X2.0 | | |
| 4470-40T2-15 | 47.0 | 40 | 60 | 188 | 223 | 70 | M30X2.0 | | |
| 4476-40T2-15 * | 47.6 | 40 | 60 | 192 | 227 | 70 | M30X2.0 | | |
| 4480-40T2-15 | 48.0 | 40 | 60 | 192 | 227 | 70 | M30X2.0 | | |
| 4490-40T2-15 | 49.0 | 40 | 60 | 196 | 231 | 70 | M30X2.0 | | |
| 4500-40T2-15 | 50.0 | 40 | 60 | 200 | 235 | 70 | M30X2.0 | | |
| 4508-40T2-15 * | 50.8 | 40 | 60 | 204 | 239 | 70 | M30X2.0 | | |

- *1* Marked items are for inch sized hole
- OAL = LPR+LS

Spare parts

| Designation | Screw | Wrench | Plug* | |
|------------------------|----------------|------------|--------------------------|--|
| TOP 4120 - 4135 | TS 18041/HG | TD 6P | SL 20M | |
| TOP 4140 - 4160 | TS 20043I/HG-P | TD 6P | SL 20M | |
| TOP 4165 - 4220 | TS 22052I/HG-P | TD 7P | SL 25M | |
| TOP 4225 - 4260 | SO 25065I | TD 7 | SL 25M / SL 32M | |
| TOP 4265 - 4360 | TS 35088I | TD 10 | SL 25M / SL 32M / SL 40M | |
| TOP 4370 - 4430 | TS 40093I | TD 15 | SL 32M / SL 40M | |
| TOP 4440 - 4508 | TS 50115I | TD 20 | SL 40M | |

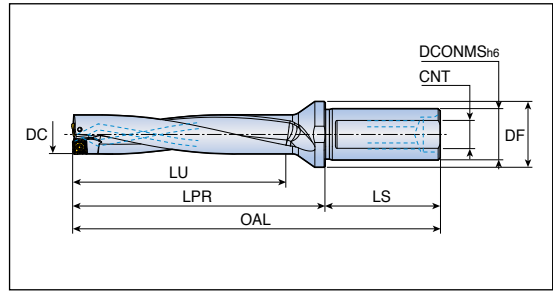


- *Notice: Cooling hole plug for lathe should be ordered separately
Order example) Plug for shank diameter 25.0mm : SL 25M

Indexable drill holders



- Drilling depth: 5x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-----------------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TOP 5120-20T2-04 | 12.0 | 20 | 25 | 60 | 80 | 50 | M13X1.0 | SOMT 04...DP |
| 5125-20T2-04 | 12.5 | 20 | 25 | 65 | 85 | 50 | M13X1.0 | D152 |
| 5130-20T2-04 | 13.0 | 20 | 25 | 65 | 85 | 50 | M13X1.0 | |
| 5135-20T2-04 | 13.5 | 20 | 25 | 70 | 88 | 50 | M13X1.0 | |
| 5140-20T2-05 | 14.0 | 20 | 25 | 70 | 88 | 50 | M13X1.0 | SOMT 05...DP/DL/DK/DA |
| 5145-20T2-05 | 14.5 | 20 | 25 | 75 | 94 | 50 | M13X1.0 | D152-153 |
| 5150-20T2-05 | 15.0 | 20 | 25 | 75 | 94 | 50 | M13X1.0 | |
| 5155-20T2-05 | 15.5 | 20 | 25 | 80 | 100 | 50 | M13X1.0 | |
| 5160-20T2-05 | 16.0 | 20 | 25 | 80 | 100 | 50 | M13X1.0 | |
| 5165-25T2-06 | 16.5 | 25 | 32 | 85 | 105 | 56 | M16X1.5 | SOMT 06...DP/DL/DK/DA |
| 5170-25T2-06 | 17.0 | 25 | 32 | 85 | 105 | 56 | M16X1.5 | D152-153 |
| 5175-25T2-06 | 17.5 | 25 | 32 | 90 | 111 | 56 | M16X1.5 | |
| 5180-25T2-06 | 18.0 | 25 | 32 | 90 | 111 | 56 | M16X1.5 | |
| 5185-25T2-06 | 18.5 | 25 | 32 | 95 | 116 | 56 | M16X1.5 | |
| 5190-25T2-06 | 19.0 | 25 | 32 | 95 | 116 | 56 | M16X1.5 | |
| 5195-25T2-07 | 19.5 | 25 | 32 | 100 | 123 | 56 | M16X1.5 | SOMT 07...DP/DL/DK/DA |
| 5200-25T2-07 | 20.0 | 25 | 32 | 100 | 123 | 56 | M16X1.5 | D152-153 |
| 5205-25T2-07 | 20.5 | 25 | 32 | 105 | 128 | 56 | M16X1.5 | |
| 5210-25T2-07 | 21.0 | 25 | 32 | 105 | 128 | 56 | M16X1.5 | |
| 5215-25T2-07 | 21.5 | 25 | 32 | 110 | 133 | 56 | M16X1.5 | |
| 5220-25T2-07 | 22.0 | 25 | 32 | 110 | 133 | 56 | M16X1.5 | |
| 5222-25T2-07 * | 22.2 | 25 | 32 | 110 | 133 | 56 | M16X1.5 | |
| 5225-25T2-08 | 22.5 | 25 | 32 | 115 | 137 | 56 | M16X1.5 | SOMT 08...DP/DL/DK/DA |
| 5230-25T2-08 | 23.0 | 25 | 32 | 115 | 137 | 56 | M16X1.5 | D152-153 |
| 5230-32T2-08 | 23.0 | 32 | 40 | 115 | 137 | 60 | M22X2.0 | |
| 5235-25T2-08 | 23.5 | 25 | 32 | 120 | 142 | 56 | M16X1.5 | |
| 5235-32T2-08 | 23.5 | 32 | 40 | 120 | 142 | 60 | M22X2.0 | |
| 5240-25T2-08 | 24.0 | 25 | 32 | 120 | 142 | 56 | M16X1.5 | |
| 5240-32T2-08 | 24.0 | 32 | 40 | 120 | 142 | 60 | M22X2.0 | |
| 5245-25T2-08 | 24.5 | 25 | 32 | 125 | 147 | 56 | M16X1.5 | |
| 5245-32T2-08 | 24.5 | 32 | 40 | 125 | 147 | 60 | M22X2.0 | |
| 5250-25T2-08 | 25.0 | 25 | 32 | 125 | 147 | 56 | M16X1.5 | |
| 5250-32T2-08 | 25.0 | 32 | 40 | 125 | 147 | 60 | M22X2.0 | |
| 5255-25T2-08 | 25.5 | 25 | 32 | 130 | 151 | 56 | M16X1.5 | |
| 5255-32T2-08 | 25.5 | 32 | 40 | 130 | 151 | 60 | M22X2.0 | |

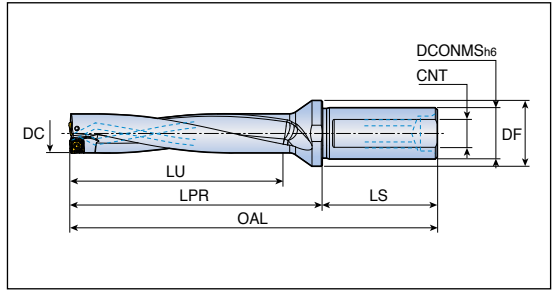


- *1 Marked items are for inch sized hole
- OAL = LPR+LS

Indexable drill holders



- Drilling depth: 5x diameter

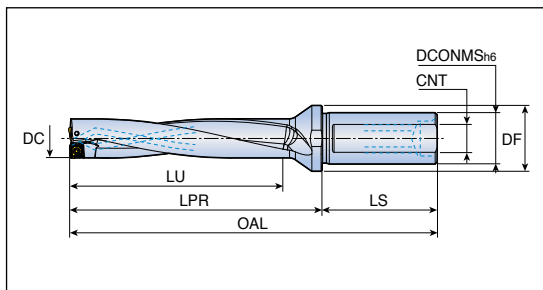


| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-----------------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TOP 5260-25T2-08 | 26.0 | 25 | 32 | 130 | 151 | 56 | M16X1.5 | SOMT 08...DP/DL/DK/DA |
| 5260-32T2-08 | 26.0 | 32 | 40 | 130 | 151 | 60 | M22X2.0 | D152-153 |
| 5265-32T2-09 | 26.5 | 32 | 40 | 135 | 158 | 60 | M22X2.0 | SOMT 09...DP/DL/DK/DA |
| 5270-25T2-09 | 27.0 | 25 | 40 | 135 | 158 | 56 | M16X1.5 | D152-153 |
| 5270-32T2-09 | 27.0 | 32 | 40 | 135 | 158 | 60 | M22X2.0 | |
| 5275-32T2-09 | 27.5 | 32 | 40 | 140 | 163 | 60 | M22X2.0 | |
| 5280-25T2-09 | 28.0 | 25 | 40 | 140 | 163 | 56 | M16X1.5 | |
| 5280-32T2-09 | 28.0 | 32 | 40 | 140 | 163 | 60 | M22X2.0 | |
| 5282-32T2-09 * | 28.2 | 32 | 40 | 140 | 163 | 60 | M22X2.0 | |
| 5285-32T2-09 | 28.5 | 32 | 40 | 145 | 168 | 60 | M22X2.0 | |
| 5290-25T2-09 | 29.0 | 25 | 40 | 145 | 168 | 56 | M16X1.5 | |
| 5290-32T2-09 | 29.0 | 32 | 40 | 145 | 168 | 60 | M22X2.0 | |
| 5295-32T2-09 | 29.5 | 32 | 40 | 150 | 173 | 60 | M22X2.0 | |
| 5300-32T2-09 | 30.0 | 32 | 40 | 150 | 173 | 60 | M22X2.0 | |
| 5305-32T2-09 | 30.5 | 32 | 40 | 155 | 178 | 60 | M22X2.0 | |
| 5310-32T2-09 | 31.0 | 32 | 40 | 155 | 178 | 60 | M22X2.0 | |
| 5320-32T2-11 | 32.0 | 32 | 40 | 160 | 183 | 60 | M22X2.0 | SOMT 11...DP/DL/DK/DA |
| 5320-40T2-11 | 32.0 | 40 | 50 | 160 | 183 | 70 | M30X2.0 | D152-153 |
| 5330-32T2-11 | 33.0 | 32 | 40 | 165 | 188 | 60 | M22X2.0 | |
| 5330-40T2-11 | 33.0 | 40 | 50 | 165 | 188 | 70 | M30X2.0 | |
| 5340-32T2-11 | 34.0 | 32 | 40 | 170 | 193 | 60 | M22X2.0 | |
| 5340-40T2-11 | 34.0 | 40 | 50 | 170 | 193 | 70 | M30X2.0 | |
| 5350-32T2-11 | 35.0 | 32 | 40 | 175 | 198 | 60 | M22X2.0 | |
| 5350-40T2-11 | 35.0 | 40 | 50 | 175 | 198 | 70 | M30X2.0 | |
| 5360-32T2-11 | 36.0 | 32 | 40 | 180 | 203 | 60 | M22X2.0 | |
| 5360-40T2-11 | 36.0 | 40 | 50 | 180 | 203 | 70 | M30X2.0 | |
| 5370-32T2-13 | 37.0 | 32 | 50 | 185 | 213 | 60 | M22X2.0 | SOMT 13...DP/DL/DK/DA |
| 5370-40T2-13 | 37.0 | 40 | 50 | 185 | 213 | 70 | M30X2.0 | D152-153 |
| 5380-32T2-13 | 38.0 | 32 | 50 | 190 | 218 | 60 | M22X2.0 | |
| 5380-40T2-13 | 38.0 | 40 | 50 | 190 | 218 | 70 | M30X2.0 | |
| 5390-32T2-13 | 39.0 | 32 | 50 | 195 | 223 | 60 | M22X2.0 | |
| 5390-40T2-13 | 39.0 | 40 | 50 | 195 | 223 | 70 | M30X2.0 | |
| 5400-32T2-13 | 40.0 | 32 | 50 | 200 | 228 | 60 | M22X2.0 | |
| 5400-40T2-13 | 40.0 | 40 | 50 | 200 | 228 | 70 | M30X2.0 | |



- '*1' Marked items are for inch sized hole
- OAL = LPR+LS

Indexable drill holders



- Drilling depth: 5x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-----------------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TOP 5410-40T2-13 | 41.0 | 40 | 50 | 205 | 233 | 70 | M30X2.0 | SOMT 13...DP/DL/DK/DA |
| 5420-40T2-13 | 42.0 | 40 | 50 | 210 | 238 | 70 | M30X2.0 | D152-153 |
| 5430-40T2-13 | 43.0 | 40 | 50 | 215 | 243 | 70 | M30X2.0 | |
| 5440-40T2-15 | 44.0 | 40 | 60 | 220 | 255 | 70 | M30X2.0 | SOMT 15...DP/DL/DK/DA |
| 5450-40T2-15 | 45.0 | 40 | 60 | 225 | 260 | 70 | M30X2.0 | D152-153 |
| 5460-40T2-15 | 46.0 | 40 | 60 | 230 | 265 | 70 | M30X2.0 | |
| 5470-40T2-15 | 47.0 | 40 | 60 | 235 | 270 | 70 | M30X2.0 | |
| 5480-40T2-15 | 48.0 | 40 | 60 | 240 | 275 | 70 | M30X2.0 | |
| 5490-40T2-15 | 49.0 | 40 | 60 | 245 | 280 | 70 | M30X2.0 | |
| 5500-40T2-15 | 50.0 | 40 | 60 | 250 | 285 | 70 | M30X2.0 | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

- OAL = LPR+LS

Spare parts

| Designation | Screw | Wrench | Plug* | |
|------------------------|----------------|--------|--------------------------|--|
| | | | | |
| TOP 5120 - 5135 | TS 18041/HG | TD 6P | SL 20M | |
| TOP 5140 - 5160 | TS 200431/HG-P | TD 6P | SL 20M | |
| TOP 5165 - 5220 | TS 220521/HG-P | TD 7P | SL 25M | |
| TOP 5225 - 5260 | SO 25065I | TD 7 | SL 25M / SL 32M | |
| TOP 5265 - 5360 | TS 35088I | TD 10 | SL 25M / SL 32M / SL 40M | |
| TOP 5370 - 5430 | TS 40093I | TD 15 | SL 32M / SL 40M | |
| TOP 5440 - 5500 | TS 50115I | TD 20 | SL 40M | |

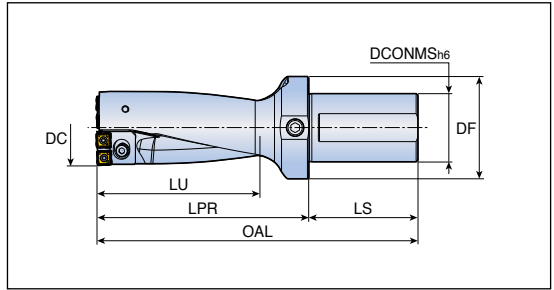


- *Notice: Cooling hole plug for lathe should be ordered separately
Order example) Plug for shank diameter 25.0mm : SL 25M

Indexable drill holders for cartridge



- Drilling depth: 2x diameter



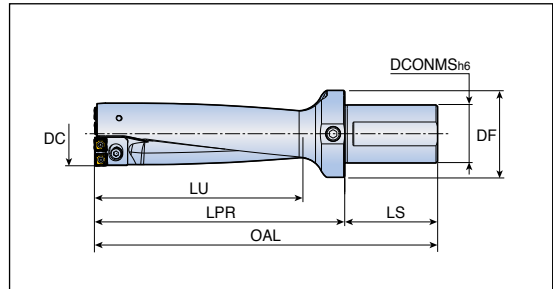
| Designation | Dimension (mm) | | | | | | | Setting Plate | Insert |
|------------------------------|----------------|--------|----|-----|-----|-----|----|---------------|-------------|
| | DC | DCONMS | DF | OAL | LU | LPR | LS | | |
| TOP 2051-55-50T2-09CA | 51 | 50 | 75 | 223 | 110 | 143 | 80 | - | SOMT 09 ... |
| | 52 | 50 | 75 | 223 | 110 | 143 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 53 | 50 | 75 | 223 | 110 | 143 | 80 | TOP-0902 | D152-153 |
| | 54 | 50 | 75 | 223 | 110 | 143 | 80 | TOP-0903 | |
| | 55 | 50 | 75 | 223 | 110 | 143 | 80 | TOP-0904 | |
| TOP 2056-60-50T2-11CA | 56 | 50 | 75 | 236 | 120 | 156 | 80 | - | SOMT 11 ... |
| | 57 | 50 | 75 | 236 | 120 | 156 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 58 | 50 | 75 | 236 | 120 | 156 | 80 | TOP-0902 | D152-153 |
| | 59 | 50 | 75 | 236 | 120 | 156 | 80 | TOP-0903 | |
| | 60 | 50 | 75 | 236 | 120 | 156 | 80 | TOP-0904 | |
| TOP 2061-65-50T2-11CA | 61 | 50 | 75 | 249 | 130 | 169 | 80 | - | SOMT 11 ... |
| | 62 | 50 | 75 | 249 | 130 | 169 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 63 | 50 | 75 | 249 | 130 | 169 | 80 | TOP-0902 | D152-153 |
| | 64 | 50 | 75 | 249 | 130 | 169 | 80 | TOP-0903 | |
| | 65 | 50 | 75 | 249 | 130 | 169 | 80 | TOP-0904 | |
| TOP 2066-70-50T2-11CA | 66 | 50 | 75 | 262 | 140 | 182 | 80 | - | SOMT 11 ... |
| | 67 | 50 | 75 | 262 | 140 | 182 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 68 | 50 | 75 | 262 | 140 | 182 | 80 | TOP-0902 | D152-153 |
| | 69 | 50 | 75 | 262 | 140 | 182 | 80 | TOP-0903 | |
| | 70 | 50 | 75 | 262 | 140 | 182 | 80 | TOP-0904 | |
| TOP 2071-75-50T2-13CA | 71 | 50 | 75 | 275 | 150 | 195 | 80 | - | SOMT 13 ... |
| | 72 | 50 | 75 | 275 | 150 | 195 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 73 | 50 | 75 | 275 | 150 | 195 | 80 | TOP-0902 | D152-153 |
| | 74 | 50 | 75 | 275 | 150 | 195 | 80 | TOP-0903 | |
| | 75 | 50 | 75 | 275 | 150 | 195 | 80 | TOP-0904 | |
| TOP 2076-80-50T2-13CA | 76 | 50 | 75 | 288 | 160 | 208 | 80 | - | SOMT 13 ... |
| | 77 | 50 | 75 | 288 | 160 | 208 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 78 | 50 | 75 | 288 | 160 | 208 | 80 | TOP-0902 | D152-153 |
| | 79 | 50 | 75 | 288 | 160 | 208 | 80 | TOP-0903 | |
| | 80 | 50 | 75 | 288 | 160 | 208 | 80 | TOP-0904 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |



Indexable drill holders for cartridge



- Drilling depth: 3x diameter



| Designation | Dimension (mm) | | | | | | | Setting Plate | Insert |
|------------------------------|----------------|--------|----|-----|-----|-----|----|---------------|-------------|
| | DC | DCONMS | DF | OAL | LU | LPR | LS | | |
| TOP 3051-55-50T2-09CA | 51 | 50 | 75 | 278 | 165 | 198 | 80 | - | SOMT 09... |
| | 52 | 50 | 75 | 278 | 165 | 198 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 53 | 50 | 75 | 278 | 165 | 198 | 80 | TOP-0902 | D152-153 |
| | 54 | 50 | 75 | 278 | 165 | 198 | 80 | TOP-0903 | |
| | 55 | 50 | 75 | 278 | 165 | 198 | 80 | TOP-0904 | |
| TOP 3056-60-50T2-11CA | 56 | 50 | 75 | 296 | 180 | 216 | 80 | - | SOMT 11... |
| | 57 | 50 | 75 | 296 | 180 | 216 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 58 | 50 | 75 | 296 | 180 | 216 | 80 | TOP-0902 | D152-153 |
| | 59 | 50 | 75 | 296 | 180 | 216 | 80 | TOP-0903 | |
| | 60 | 50 | 75 | 296 | 180 | 216 | 80 | TOP-0904 | |
| TOP 3061-65-50T2-11CA | 61 | 50 | 75 | 314 | 195 | 234 | 80 | - | SOMT 11... |
| | 62 | 50 | 75 | 314 | 195 | 234 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 63 | 50 | 75 | 314 | 195 | 234 | 80 | TOP-0902 | D152-153 |
| | 64 | 50 | 75 | 314 | 195 | 234 | 80 | TOP-0903 | |
| | 65 | 50 | 75 | 314 | 195 | 234 | 80 | TOP-0904 | |
| TOP 3066-70-50T2-11CA | 66 | 50 | 75 | 332 | 210 | 252 | 80 | - | SOMT 11... |
| | 67 | 50 | 75 | 332 | 210 | 252 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 68 | 50 | 75 | 332 | 210 | 252 | 80 | TOP-0902 | D152-153 |
| | 69 | 50 | 75 | 332 | 210 | 252 | 80 | TOP-0903 | |
| | 70 | 50 | 75 | 332 | 210 | 252 | 80 | TOP-0904 | |
| TOP 3071-75-50T2-13CA | 71 | 50 | 75 | 350 | 225 | 270 | 80 | - | SOMT 13... |
| | 72 | 50 | 75 | 350 | 225 | 270 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 73 | 50 | 75 | 350 | 225 | 270 | 80 | TOP-0902 | D152-153 |
| | 74 | 50 | 75 | 350 | 225 | 270 | 80 | TOP-0903 | |
| | 75 | 50 | 75 | 350 | 225 | 270 | 80 | TOP-0904 | |
| TOP 3076-80-50T2-13CA | 76 | 50 | 75 | 368 | 240 | 288 | 80 | - | SOMT 13... |
| | 77 | 50 | 75 | 368 | 240 | 288 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 78 | 50 | 75 | 368 | 240 | 288 | 80 | TOP-0902 | D152-153 |
| | 79 | 50 | 75 | 368 | 240 | 288 | 80 | TOP-0903 | |
| | 80 | 50 | 75 | 368 | 240 | 288 | 80 | TOP-0904 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

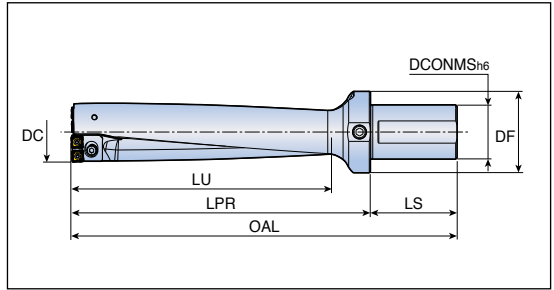


TOP 40...CA

Indexable drill holders for cartridge



- Drilling depth: 4x diameter






| Designation | Dimension (mm) | | | | | | | Setting Plate | Insert |
|------------------------------|----------------|--------|----|-----|-----|-----|----|---------------|-------------|
| | DC | DCONMS | DF | OAL | LU | LPR | LS | | |
| TOP 4051-55-50T2-09CA | 51 | 50 | 75 | 333 | 220 | 253 | 80 | - | SOMT 09 ... |
| | 52 | 50 | 75 | 333 | 220 | 253 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 53 | 50 | 75 | 333 | 220 | 253 | 80 | TOP-0902 | D152-153 |
| | 54 | 50 | 75 | 333 | 220 | 253 | 80 | TOP-0903 | |
| | 55 | 50 | 75 | 333 | 220 | 253 | 80 | TOP-0904 | |
| TOP 4056-60-50T2-11CA | 56 | 50 | 75 | 356 | 240 | 276 | 80 | - | SOMT 11 ... |
| | 57 | 50 | 75 | 356 | 240 | 276 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 58 | 50 | 75 | 356 | 240 | 276 | 80 | TOP-0902 | D152-153 |
| | 59 | 50 | 75 | 356 | 240 | 276 | 80 | TOP-0903 | |
| | 60 | 50 | 75 | 356 | 240 | 276 | 80 | TOP-0904 | |
| TOP 4061-65-50T2-11CA | 61 | 50 | 75 | 379 | 260 | 299 | 80 | - | SOMT 11 ... |
| | 62 | 50 | 75 | 379 | 260 | 299 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 63 | 50 | 75 | 379 | 260 | 299 | 80 | TOP-0902 | D152-153 |
| | 64 | 50 | 75 | 379 | 260 | 299 | 80 | TOP-0903 | |
| | 65 | 50 | 75 | 379 | 260 | 299 | 80 | TOP-0904 | |
| TOP 4066-70-50T2-11CA | 66 | 50 | 75 | 402 | 280 | 322 | 80 | - | SOMT 11 ... |
| | 67 | 50 | 75 | 402 | 280 | 322 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 68 | 50 | 75 | 402 | 280 | 322 | 80 | TOP-0902 | D152-153 |
| | 69 | 50 | 75 | 402 | 280 | 322 | 80 | TOP-0903 | |
| | 70 | 50 | 75 | 402 | 280 | 322 | 80 | TOP-0904 | |
| TOP 4071-75-50T2-13CA | 71 | 50 | 75 | 425 | 300 | 345 | 80 | - | SOMT 13 ... |
| | 72 | 50 | 75 | 425 | 300 | 345 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 73 | 50 | 75 | 425 | 300 | 345 | 80 | TOP-0902 | D152-153 |
| | 74 | 50 | 75 | 425 | 300 | 345 | 80 | TOP-0903 | |
| | 75 | 50 | 75 | 425 | 300 | 345 | 80 | TOP-0904 | |
| TOP 4076-80-50T2-13CA | 76 | 50 | 75 | 448 | 320 | 368 | 80 | - | SOMT 13 ... |
| | 77 | 50 | 75 | 448 | 320 | 368 | 80 | TOP-0901 | DP/DL/DK/DA |
| | 78 | 50 | 75 | 448 | 320 | 368 | 80 | TOP-0902 | D152-153 |
| | 79 | 50 | 75 | 448 | 320 | 368 | 80 | TOP-0903 | |
| | 80 | 50 | 75 | 448 | 320 | 368 | 80 | TOP-0904 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |



Indexable drill holders for cartridge

Spare parts

| Designation | Screw | Cartridge for peripheral | Cartridge for center |
|------------------------------|---|---|---|
| |  |  |  |
| TOP ..51-55-50T2-09CA | TS 35088I | TOP 09CA-P1 | TOP 09CA-C1 |
| TOP ..56-60-50T2-11CA | TS 35088I | TOP 11CA-P1 | TOP 11CA-C1 |
| TOP ..61-65-50T2-11CA | TS 35088I | TOP 11CA-P2 | TOP 11CA-C2 |
| TOP ..66-70-50T2-11CA | TS 35088I | TOP 11CA-P3 | TOP 11CA-C3 |
| TOP ..71-75-50T2-13CA | TS 40093I | TOP 13CA-P1 | TOP 13CA-C1 |
| TOP ..76-80-50T2-13CA | TS 40093I | TOP 13CA-P2 | TOP 13CA-C2 |

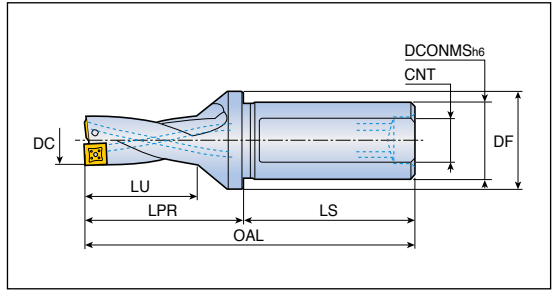
Spare parts for cartridge

| Designation | Cartridge clamping screw | Washer | Setting plate screw |
|--------------------|--------------------------|-----------|---------------------|
| TOP 09CA-P1 | SH M4x0.7x16 | MW 4.3x8 | TS 20043I/HG-P |
| TOP 09CA-C1 | SH M4x0.7x16 | MW 4.3x8 | - |
| TOP 11CA-P1 | SH M5x0.8x16 | MW 5.5x10 | TS 20043I/HG-P |
| TOP 11CA-C1 | SH M5x0.8x16 | MW 5.5x10 | - |
| TOP 11CA-P2 | SH M5x0.8x16 | MW 5.5x10 | TS 20043I/HG-P |
| TOP 11CA-C2 | SH M5x0.8x16 | MW 5.5x10 | - |
| TOP 11CA-P3 | SH M5x0.8x16 | MW 5.5x10 | TS 20043I/HG-P |
| TOP 11CA-C3 | SH M5x0.8x16 | MW 5.5x10 | - |
| TOP 13CA-P1 | SH M6x1.0x20 | MW 6.4x12 | TS 20043I/HG-P |
| TOP 13CA-C1 | SH M6x1.0x20 | MW 6.4x12 | - |
| TOP 13CA-P2 | SH M6x1.0x20 | MW 6.4x12 | TS 20043I/HG-P |
| TOP 13CA-C2 | SH M6x1.0x20 | MW 6.4x12 | - |

Indexable drill holders



- Drilling depth: 2x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|----|-----|----|---------|-------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TDR 2125-20T2-05 | 12.5 | 20 | 25 | 26 | 44 | 50 | M13X1.0 | SPMG 05... |
| 2130-20T2-05 | 13.0 | 20 | 25 | 26 | 44 | 50 | M13X1.0 | DG/DK |
| 2135-20T2-05 | 13.5 | 20 | 25 | 28 | 46 | 50 | M13X1.0 | SPGG 05..DA |
| 2140-20T2-05 | 14.0 | 20 | 25 | 28 | 46 | 50 | M13X1.0 | D154-155 |
| 2145-20T2-05 | 14.5 | 20 | 25 | 30 | 49 | 50 | M13X1.0 | |
| 2150-20T2-05 | 15.0 | 20 | 25 | 30 | 49 | 50 | M13X1.0 | |
| 2155-25T2-06 | 15.5 | 25 | 32 | 32 | 52 | 56 | M16X1.5 | SPMG 06... |
| 2160-25T2-06 | 16.0 | 25 | 32 | 32 | 52 | 56 | M16X1.5 | DG/DK |
| 2165-25T2-06 | 16.5 | 25 | 32 | 34 | 54 | 56 | M16X1.5 | SPGG 06..DA |
| 2170-25T2-06 | 17.0 | 25 | 32 | 34 | 54 | 56 | M16X1.5 | D154-155 |
| 2175-25T2-06 | 17.5 | 25 | 32 | 36 | 57 | 56 | M16X1.5 | |
| 2180-25T2-06 | 18.0 | 25 | 32 | 36 | 57 | 56 | M16X1.5 | |
| 2185-25T2-06 | 18.5 | 25 | 32 | 38 | 59 | 56 | M16X1.5 | |
| 2190-25T2-06 | 19.0 | 25 | 32 | 38 | 59 | 56 | M16X1.5 | |
| 2195-25T2-06 | 19.5 | 25 | 32 | 40 | 63 | 56 | M16X1.5 | |
| 2200-25T2-06 | 20.0 | 25 | 32 | 40 | 63 | 56 | M16X1.5 | |
| 2205-25T2-06 | 20.5 | 25 | 32 | 42 | 65 | 56 | M16X1.5 | |
| 2210-25T2-06 | 21.0 | 25 | 32 | 42 | 65 | 56 | M16X1.5 | |
| 2215-25T2-06 | 21.5 | 25 | 32 | 44 | 67 | 56 | M16X1.5 | |
| 2220-25T2-07 | 22.0 | 25 | 32 | 44 | 67 | 56 | M16X1.5 | SPMG 07... |
| 2225-25T2-07 | 22.5 | 25 | 32 | 46 | 71 | 56 | M16X1.5 | DG/DK |
| 2225-32T2-07 | 22.5 | 32 | 40 | 46 | 71 | 60 | M22X2.0 | SPGG 07..DA |
| 2230-25T2-07 | 23.0 | 25 | 32 | 46 | 71 | 56 | M16X1.5 | D154-155 |
| 2230-32T2-07 | 23.0 | 32 | 40 | 46 | 71 | 60 | M22X2.0 | |
| 2235-25T2-07 | 23.5 | 25 | 32 | 48 | 74 | 56 | M16X1.5 | |
| 2235-32T2-07 | 23.5 | 32 | 40 | 48 | 74 | 60 | M22X2.0 | |
| 2240-25T2-07 | 24.0 | 25 | 32 | 48 | 74 | 56 | M16X1.5 | |
| 2240-32T2-07 | 24.0 | 32 | 40 | 48 | 74 | 60 | M22X2.0 | |
| 2245-25T2-07 | 24.5 | 25 | 32 | 50 | 77 | 56 | M16X1.5 | |
| 2245-32T2-07 | 24.5 | 32 | 40 | 50 | 77 | 60 | M22X2.0 | |
| 2250-25T2-07 | 25.0 | 25 | 32 | 50 | 77 | 56 | M16X1.5 | |
| 2250-32T2-07 | 25.0 | 32 | 40 | 50 | 77 | 60 | M22X2.0 | |
| 2255-25T2-07 | 25.5 | 25 | 32 | 52 | 79 | 56 | M16X1.5 | |
| 2255-32T2-07 | 25.5 | 32 | 40 | 52 | 79 | 60 | M22X2.0 | |
| 2260-25T2-07 | 26.0 | 25 | 32 | 52 | 79 | 56 | M16X1.5 | |

• OAL = LPR+LS

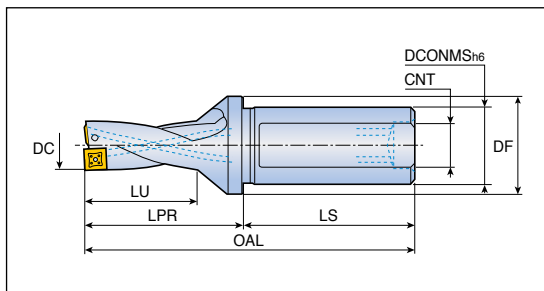


TDR 2...-T2

Indexable drill holders



- Drilling depth: 2x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|----|-----|----|---------|--|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TDR 2260-32T2-07 | 26.0 | 32 | 40 | 52 | 79 | 60 | M22X2.0 | SPMG 07... DG/DK SPGG 07..DA D154-155 |
| 2265-25T2-07 | 26.5 | 25 | 32 | 54 | 81 | 56 | M16X1.5 | |
| 2265-32T2-07 | 26.5 | 32 | 40 | 54 | 81 | 60 | M22X2.0 | |
| 2270-25T2-07 | 27.0 | 25 | 32 | 54 | 81 | 56 | M16X1.5 | |
| 2270-32T2-07 | 27.0 | 32 | 40 | 54 | 81 | 60 | M22X2.0 | |
| 2275-25T2-07 | 27.5 | 25 | 32 | 56 | 84 | 56 | Rc 1/8 | |
| 2275-32T2-07 | 27.5 | 32 | 40 | 56 | 84 | 60 | Rc 1/4 | |
| 2280-25T2-09 | 28.0 | 25 | 40 | 56 | 84 | 56 | Rc 1/8 | SPMG 09... DG/DK SPGG 09..DA D154-155 |
| 2280-32T2-09 | 28.0 | 32 | 40 | 56 | 84 | 60 | Rc 1/4 | |
| 2285-25T2-09 | 28.5 | 25 | 40 | 58 | 86 | 56 | Rc 1/8 | |
| 2285-32T2-09 | 28.5 | 32 | 40 | 58 | 86 | 60 | Rc 1/4 | |
| 2290-25T2-09 | 29.0 | 25 | 40 | 58 | 86 | 56 | Rc 1/8 | |
| 2290-32T2-09 | 29.0 | 32 | 40 | 58 | 86 | 60 | Rc 1/4 | |
| 2295-32T2-09 | 29.5 | 32 | 40 | 60 | 91 | 60 | Rc 1/4 | |
| 2295-40T2-09 | 29.5 | 40 | 50 | 60 | 91 | 70 | Rc 1/4 | |
| 2300-32T2-09 | 30.0 | 32 | 40 | 60 | 91 | 60 | Rc 1/4 | |
| 2300-40T2-09 | 30.0 | 40 | 50 | 60 | 91 | 70 | Rc 1/4 | |
| 2305-32T2-09 | 30.5 | 32 | 40 | 62 | 94 | 60 | Rc 1/4 | |
| 2305-40T2-09 | 30.5 | 40 | 50 | 62 | 94 | 70 | Rc 1/4 | |
| 2310-32T2-09 | 31.0 | 32 | 40 | 62 | 94 | 60 | Rc 1/4 | |
| 2310-40T2-09 | 31.0 | 40 | 50 | 62 | 94 | 70 | Rc 1/4 | |
| 2315-32T2-09 | 31.5 | 32 | 40 | 64 | 96 | 60 | Rc 1/4 | |
| 2315-40T2-09 | 31.5 | 40 | 50 | 64 | 96 | 70 | Rc 1/4 | |
| 2320-32T2-09 | 32.0 | 32 | 40 | 64 | 96 | 60 | Rc 1/4 | |
| 2320-40T2-09 | 32.0 | 40 | 50 | 64 | 96 | 70 | Rc 1/4 | |
| 2325-32T2-09 | 32.5 | 32 | 40 | 66 | 99 | 60 | Rc 1/4 | |
| 2325-40T2-09 | 32.5 | 40 | 50 | 66 | 99 | 70 | Rc 1/4 | |
| 2330-32T2-09 | 33.0 | 32 | 40 | 66 | 99 | 60 | Rc 1/4 | |
| 2330-40T2-09 | 33.0 | 40 | 50 | 66 | 99 | 70 | Rc 1/4 | |
| 2340-32T2-11 | 34.0 | 32 | 50 | 68 | 101 | 60 | Rc 1/4 | SPMG 11... DG/DK SPGG 11..DA D154-155 |
| 2340-40T2-11 | 34.0 | 40 | 55 | 68 | 101 | 70 | Rc 1/4 | |
| 2350-32T2-11 | 35.0 | 32 | 50 | 70 | 104 | 60 | Rc 1/4 | |
| 2350-40T2-11 | 35.0 | 40 | 55 | 70 | 104 | 70 | Rc 1/4 | |
| 2360-32T2-11 | 36.0 | 32 | 50 | 72 | 107 | 60 | Rc 1/4 | |
| 2360-40T2-11 | 36.0 | 40 | 55 | 72 | 107 | 70 | Rc 1/4 | |

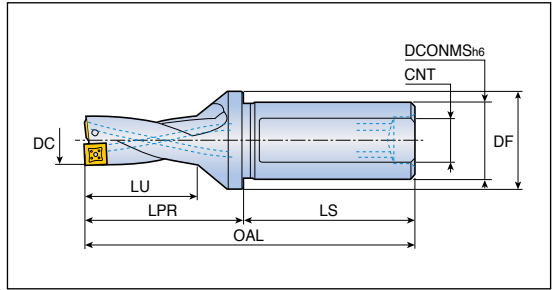
- OAL = LPR+LS



Indexable drill holders



- Drilling depth: 2x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|--------|--|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TDR 2370-32T2-11 | 37.0 | 32 | 50 | 74 | 110 | 60 | Rc 1/4 | SPMG 11... DG/DK SPGG 11..DA D154-155 |
| 2370-40T2-11 | 37.0 | 40 | 55 | 74 | 110 | 70 | Rc 1/4 | |
| 2380-32T2-11 | 38.0 | 32 | 50 | 76 | 113 | 60 | Rc 1/4 | |
| 2380-40T2-11 | 38.0 | 40 | 55 | 76 | 113 | 70 | Rc 1/4 | |
| 2390-32T2-11 | 39.0 | 32 | 50 | 78 | 115 | 60 | Rc 1/4 | |
| 2390-40T2-11 | 39.0 | 40 | 55 | 78 | 115 | 70 | Rc 1/4 | |
| 2400-32T2-11 | 40.0 | 32 | 50 | 80 | 118 | 60 | Rc 1/4 | |
| 2400-40T2-11 | 40.0 | 40 | 55 | 80 | 118 | 70 | Rc 1/4 | |
| 2410-40T2-11 | 41.0 | 40 | 55 | 82 | 121 | 70 | Rc 1/4 | |
| 2420-40T2-14 | 42.0 | 40 | 60 | 84 | 123 | 70 | Rc 1/4 | |
| 2430-40T2-14 | 43.0 | 40 | 60 | 86 | 126 | 70 | Rc 1/4 | |
| 2440-40T2-14 | 44.0 | 40 | 60 | 88 | 128 | 70 | Rc 1/4 | |
| 2450-40T2-14 | 45.0 | 40 | 60 | 90 | 132 | 70 | Rc 1/4 | |
| 2460-40T2-14 | 46.0 | 40 | 60 | 92 | 135 | 70 | Rc 1/4 | |
| 2470-40T2-14 | 47.0 | 40 | 60 | 94 | 137 | 70 | Rc 1/4 | |
| 2480-40T2-14 | 48.0 | 40 | 60 | 96 | 140 | 70 | Rc 1/4 | |
| 2490-40T2-14 | 49.0 | 40 | 60 | 98 | 142 | 70 | Rc 1/4 | |
| 2500-40T2-14 | 50.0 | 40 | 60 | 100 | 145 | 70 | Rc 1/4 | |

- OAL = LPR + LS

Spare parts

| Designation | Screw | Wrench | Plug | |
|------------------------|----------------|--------|-------------------|--|
| | | | | |
| TDR 2125 - 2150 | TS 20043I/HG-P | TD 6P | SL 20 M | |
| TDR 2155 - 2215 | TS 22052I/HG | TD 7 | SL 25 M | |
| TDR 2220 - 2270 | TS 25064I | TD 8 | SL 25 M / SL 32 M | |
| TDR 2275 | TS 25064I | TD 8 | - | |
| TDR 2280 - 2330 | TS 35088I | TD 10 | - | |
| TDR 2340 - 2390 | TS 40093I | TD 15 | - | |
| TDR 2400 - 2410 | TS 40093I | TD 15 | - | |
| TDR 2420 - 2500 | SO 50090I | TD 20 | - | |

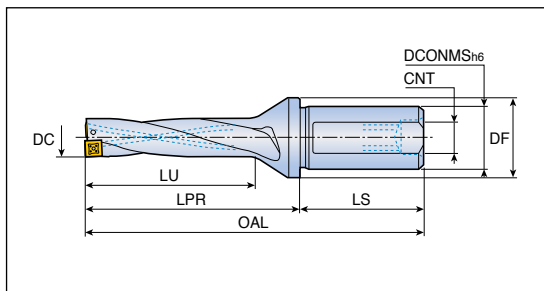


TDR 3...-T2

Indexable drill holders



- Drilling depth: 3x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|----|-----|----|---------|-------------------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TDR 3125-20T2-05 | 12.5 | 20 | 25 | 39 | 57 | 50 | M13X1.0 | SPMG 05... DG/DK |
| 3130-20T2-05 | 13.0 | 20 | 25 | 39 | 57 | 50 | M13X1.0 | |
| 3135-20T2-05 | 13.5 | 20 | 25 | 42 | 60 | 50 | M13X1.0 | SPGG 05..DA D154-155 |
| 3140-20T2-05 | 14.0 | 20 | 25 | 42 | 60 | 50 | M13X1.0 | |
| 3145-20T2-05 | 14.5 | 20 | 25 | 45 | 64 | 50 | M13X1.0 | SPMG 06... DG/DK |
| 3150-20T2-05 | 15.0 | 20 | 25 | 45 | 64 | 50 | M13X1.0 | |
| 3155-25T2-06 | 15.5 | 25 | 32 | 48 | 68 | 56 | M16X1.5 | SPGG 06..DA D154-155 |
| 3160-25T2-06 | 16.0 | 25 | 32 | 48 | 68 | 56 | M16X1.5 | |
| 3165-25T2-06 | 16.5 | 25 | 32 | 51 | 71 | 56 | M16X1.5 | SPMG 07... DG/DK |
| 3170-25T2-06 | 17.0 | 25 | 32 | 51 | 71 | 56 | M16X1.5 | |
| 3175-25T2-06 | 17.5 | 25 | 32 | 54 | 75 | 56 | M16X1.5 | SPGG 07..DA D154-155 |
| 3180-25T2-06 | 18.0 | 25 | 32 | 54 | 75 | 56 | M16X1.5 | |
| 3185-25T2-06 | 18.5 | 25 | 32 | 57 | 78 | 56 | M16X1.5 | SPMG 07... DG/DK |
| 3190-25T2-06 | 19.0 | 25 | 32 | 57 | 78 | 56 | M16X1.5 | |
| 3195-25T2-06 | 19.5 | 25 | 32 | 60 | 83 | 56 | M16X1.5 | SPGG 07..DA D154-155 |
| 3200-25T2-06 * | 20.0 | 25 | 32 | 60 | 83 | 56 | M16X1.5 | |
| 3205-25T2-06 | 20.5 | 25 | 32 | 63 | 86 | 56 | M16X1.5 | SPMG 07... DG/DK |
| 3209-25T2-06 * | 20.9 | 25 | 32 | 63 | 86 | 56 | M16X1.5 | |
| 3210-25T2-06 | 21.0 | 25 | 32 | 63 | 86 | 56 | M16X1.5 | SPGG 07..DA D154-155 |
| 3215-25T2-06 | 21.5 | 25 | 32 | 66 | 89 | 56 | M16X1.5 | |
| 3220-25T2-07 | 22.0 | 25 | 32 | 66 | 89 | 56 | M16X1.5 | SPMG 07... DG/DK |
| 3225-25T2-07 | 22.5 | 25 | 32 | 69 | 94 | 56 | M16X1.5 | |
| 3225-32T2-07 | 22.5 | 32 | 40 | 69 | 94 | 60 | M22X2.0 | SPGG 07..DA D154-155 |
| 3230-25T2-07 | 23.0 | 25 | 32 | 69 | 94 | 56 | M16X1.5 | |
| 3230-32T2-07 | 23.0 | 32 | 40 | 69 | 94 | 60 | M22X2.0 | SPMG 07... DG/DK |
| 3235-25T2-07 | 23.5 | 25 | 32 | 72 | 98 | 56 | M16X1.5 | |
| 3235-32T2-07 | 23.5 | 32 | 40 | 72 | 98 | 60 | M22X2.0 | SPGG 07..DA D154-155 |
| 3239-25T2-07 * | 23.9 | 25 | 32 | 72 | 98 | 56 | M16X1.5 | |
| 3239-32T2-07 * | 23.9 | 32 | 45 | 72 | 98 | 60 | M22X2.0 | SPMG 07... DG/DK |
| 3240-25T2-07 | 24.0 | 25 | 32 | 72 | 98 | 56 | M16X1.5 | |
| 3240-32T2-07 | 24.0 | 32 | 40 | 72 | 98 | 60 | M22X2.0 | SPGG 07..DA D154-155 |
| 3245-25T2-07 | 24.5 | 25 | 32 | 75 | 102 | 56 | M16X1.5 | |
| 3245-32T2-07 | 24.5 | 32 | 40 | 75 | 102 | 60 | M22X2.0 | SPMG 07... DG/DK |
| 3250-25T2-07 | 25.0 | 25 | 32 | 75 | 102 | 56 | M16X1.5 | |
| 3250-32T2-07 | 25.0 | 32 | 40 | 75 | 102 | 60 | M22X2.0 | |

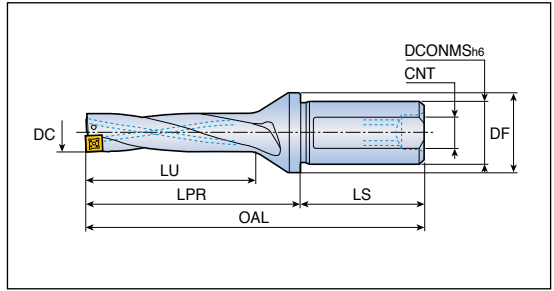


- *! Marked items are for pre-thread hole making
- OAL = LPR+LS

Indexable drill holders



- Drilling depth: 3x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|----|-----|----|---------|--|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TDR 3255-25T2-07 | 25.5 | 25 | 32 | 78 | 105 | 56 | M16X1.5 | SPMG 07... DG/DK SPGG 07..DA D154-155 |
| 3255-32T2-07 | 25.5 | 32 | 40 | 78 | 105 | 60 | M22X2.0 | |
| 3260-25T2-07 | 26.0 | 25 | 32 | 78 | 105 | 56 | M16X1.5 | |
| 3260-32T2-07 | 26.0 | 32 | 40 | 78 | 105 | 60 | M22X2.0 | |
| 3264-25T2-07 * | 26.4 | 25 | 45 | 81 | 108 | 56 | M16X1.5 | |
| 3264-32T2-07 * | 26.4 | 32 | 45 | 81 | 108 | 60 | M22X2.0 | |
| 3265-25T2-07 | 26.5 | 25 | 32 | 81 | 108 | 56 | M16X1.5 | |
| 3265-32T2-07 | 26.5 | 32 | 40 | 81 | 108 | 60 | M22X2.0 | |
| 3270-25T2-07 | 27.0 | 25 | 32 | 81 | 108 | 56 | M16X1.5 | |
| 3270-32T2-07 | 27.0 | 32 | 40 | 81 | 108 | 60 | M22X2.0 | |
| 3275-25T2-07 | 27.5 | 25 | 32 | 84 | 112 | 56 | Rc 1/8 | |
| 3275-32T2-07 | 27.5 | 32 | 40 | 84 | 112 | 60 | Rc 1/4 | |
| 3280-25T2-09 | 28.0 | 25 | 40 | 84 | 112 | 56 | Rc 1/8 | SPMG 09... DG/DK SPGG 09..DA D154-155 |
| 3280-32T2-09 | 28.0 | 32 | 40 | 84 | 112 | 60 | Rc 1/4 | |
| 3285-25T2-09 | 28.5 | 25 | 40 | 87 | 115 | 56 | Rc 1/8 | |
| 3285-32T2-09 | 28.5 | 32 | 40 | 87 | 115 | 56 | Rc 1/4 | |
| 3290-25T2-09 | 29.0 | 25 | 40 | 87 | 115 | 56 | Rc 1/8 | |
| 3290-32T2-09 | 29.0 | 32 | 40 | 87 | 115 | 60 | Rc 1/4 | |
| 3294-32T2-09 * | 29.4 | 32 | 55 | 90 | 121 | 60 | Rc 1/4 | |
| 3294-40T2-09 * | 29.4 | 40 | 55 | 90 | 121 | 70 | Rc 1/4 | |
| 3295-32T2-09 | 29.5 | 32 | 40 | 90 | 121 | 60 | Rc 1/4 | |
| 3295-40T2-09 | 29.5 | 40 | 50 | 90 | 121 | 70 | Rc 1/4 | |
| 3300-32T2-09 | 30.0 | 32 | 40 | 90 | 121 | 60 | Rc 1/4 | |
| 3300-40T2-09 | 30.0 | 40 | 50 | 90 | 121 | 70 | Rc 1/4 | |
| 3305-32T2-09 | 30.5 | 32 | 40 | 93 | 125 | 60 | Rc 1/4 | |
| 3305-40T2-09 | 30.5 | 40 | 50 | 93 | 125 | 70 | Rc 1/4 | |
| 3310-32T2-09 | 31.0 | 32 | 40 | 93 | 125 | 60 | Rc 1/4 | |
| 3310-40T2-09 | 31.0 | 40 | 50 | 93 | 125 | 70 | Rc 1/4 | |
| 3315-32T2-09 | 31.5 | 32 | 40 | 96 | 128 | 60 | Rc 1/4 | |
| 3315-40T2-09 | 31.5 | 40 | 50 | 96 | 128 | 70 | Rc 1/4 | |
| 3320-32T2-09 | 32.0 | 32 | 40 | 96 | 128 | 60 | Rc 1/4 | |
| 3320-40T2-09 | 32.0 | 40 | 50 | 96 | 128 | 70 | Rc 1/4 | |

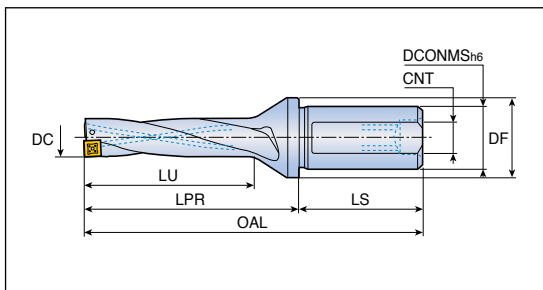


- !*! Marked items are for pre-thread hole making
- OAL = LPR + LS

Indexable drill holders



- Drilling depth: 3x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|--------|-------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TDR 3325-32T2-09 | 32.5 | 32 | 40 | 99 | 132 | 60 | Rc 1/4 | SPMG 09... |
| 3325-40T2-09 | 32.5 | 40 | 50 | 99 | 132 | 70 | Rc 1/4 | DG/DK |
| 3330-32T2-09 | 33.0 | 32 | 40 | 99 | 132 | 60 | Rc 1/4 | SPGG 09..DA |
| 3330-40T2-09 | 33.0 | 40 | 50 | 99 | 132 | 70 | Rc 1/4 | D154-155 |
| 3340-32T2-11 | 34.0 | 32 | 50 | 102 | 135 | 60 | Rc 1/4 | SPMG 11... |
| 3340-40T2-11 | 34.0 | 40 | 55 | 102 | 135 | 70 | Rc 1/4 | DG/DK |
| 3350-32T2-11 | 35.0 | 32 | 50 | 105 | 139 | 60 | Rc 1/4 | SPGG 09..DA |
| 3350-40T2-11 | 35.0 | 40 | 55 | 105 | 139 | 70 | Rc 1/4 | D154-155 |
| 3360-32T2-11 | 36.0 | 32 | 50 | 108 | 143 | 60 | Rc 1/4 | |
| 3360-40T2-11 | 36.0 | 40 | 55 | 108 | 143 | 70 | Rc 1/4 | |
| 3370-32T2-11 | 37.0 | 32 | 50 | 111 | 147 | 60 | Rc 1/4 | |
| 3370-40T2-11 | 37.0 | 40 | 55 | 111 | 147 | 70 | Rc 1/4 | |
| 3375-32T2-11 * | 37.5 | 32 | 55 | 114 | 151 | 60 | Rc 1/4 | |
| 3375-40T2-11 * | 37.5 | 40 | 55 | 114 | 151 | 70 | Rc 1/4 | |
| 3380-32T2-11 | 38.0 | 32 | 50 | 114 | 151 | 60 | Rc 1/4 | |
| 3380-40T2-11 | 38.0 | 40 | 55 | 114 | 151 | 70 | Rc 1/4 | |
| 3390-32T2-11 | 39.0 | 32 | 50 | 117 | 154 | 60 | Rc 1/4 | |
| 3390-40T2-11 | 39.0 | 40 | 55 | 117 | 154 | 70 | Rc 1/4 | |
| 3400-32T2-11 | 40.0 | 32 | 50 | 120 | 158 | 60 | Rc 1/4 | |
| 3400-40T2-11 | 40.0 | 40 | 55 | 120 | 158 | 70 | Rc 1/4 | |
| 3405-40T2-11 * | 40.5 | 40 | 60 | 123 | 162 | 70 | Rc 1/4 | |
| 3410-40T2-11 | 41.0 | 40 | 55 | 123 | 162 | 70 | Rc 1/4 | |
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- *! Marked items are for pre-thread hole making
- OAL = LPR+LS

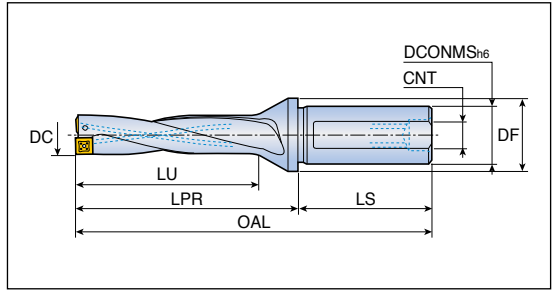
TDR 3...-T2



Indexable drill holders



- Drilling depth: 3x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|--------|-------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TDR 3420-40T2-14 | 42.0 | 40 | 60 | 126 | 165 | 70 | Rc 1/4 | SPMG 14... |
| 3430-40T2-14 | 43.0 | 40 | 60 | 129 | 169 | 70 | Rc 1/4 | DG/DK |
| 3440-40T2-14 | 44.0 | 40 | 60 | 132 | 172 | 70 | Rc 1/4 | SPGG 14..DA |
| 3450-40T2-14 | 45.0 | 40 | 60 | 135 | 177 | 70 | Rc 1/4 | D154-155 |
| 3460-40T2-14 | 46.0 | 40 | 60 | 138 | 181 | 70 | Rc 1/4 | |
| 3470-40T2-14 | 47.0 | 40 | 60 | 141 | 184 | 70 | Rc 1/4 | |
| 3480-40T2-14 | 48.0 | 40 | 60 | 144 | 188 | 70 | Rc 1/4 | |
| 3490-40T2-14 | 49.0 | 40 | 60 | 147 | 191 | 70 | Rc 1/4 | |
| 3500-40T2-14 | 50.0 | 40 | 60 | 150 | 195 | 70 | Rc 1/4 | |
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- OAL = LPR+LS

Spare parts

| Designation | Screw | Wrench | Plug | |
|------------------------|----------------|------------|-------------------|--|
| TDR 3125 - 3150 | TS 20043I/HG-P | TD 6P | SL 20 M | |
| TDR 3155 - 3215 | TS 22052I/HG | TD 7 | SL 25 M | |
| TDR 3220 - 3270 | TS 25064I | TD 8 | SL 25 M / SL 32 M | |
| TDR 3275 | TS 25064I | TD 8 | - | |
| TDR 3280 - 3330 | TS 35088I | TD 10 | - | |
| TDR 3340 - 3390 | TS 40093I | TD 15 | - | |
| TDR 3400 - 3410 | TS 40093I | TD 15 | - | |
| TDR 3420 - 3500 | SO 50090I | TD 20 | - | |

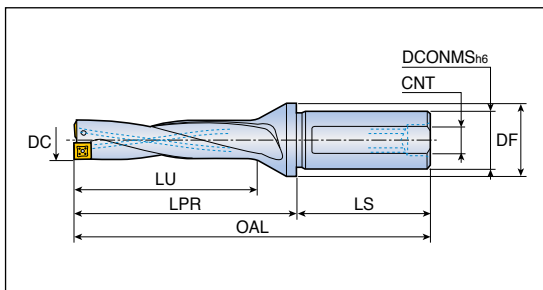


TDR 4...-T2

Indexable drill holders



- Drilling depth: 4xdiameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TDR 4125-20T2-05 | 12.5 | 20 | 25 | 52 | 70 | 50 | M13X1.0 | SPMG 05... |
| 4130-20T2-05 | 13.0 | 20 | 25 | 52 | 70 | 50 | M13X1.0 | DG/DK |
| 4135-20T2-05 | 13.5 | 20 | 25 | 56 | 74 | 50 | M13X1.0 | SPGG 05..DA |
| 4140-20T2-05 | 14.0 | 20 | 25 | 56 | 74 | 50 | M13X1.0 | D154-155 |
| 4145-20T2-05 | 14.5 | 20 | 25 | 60 | 79 | 50 | M13X1.0 | |
| 4150-20T2-05 | 15.0 | 20 | 25 | 60 | 79 | 50 | M13X1.0 | |
| 4155-25T2-06 | 15.5 | 25 | 32 | 64 | 84 | 56 | M16X1.5 | SPMG 06... |
| 4160-25T2-06 | 16.0 | 25 | 32 | 64 | 84 | 56 | M16X1.5 | DG/DK |
| 4165-25T2-06 | 16.5 | 25 | 32 | 68 | 88 | 56 | M16X1.5 | SPGG 06..DA |
| 4170-25T2-06 | 17.0 | 25 | 32 | 68 | 88 | 56 | M16X1.5 | D154-155 |
| 4175-25T2-06 | 17.5 | 25 | 32 | 72 | 93 | 56 | M16X1.5 | |
| 4180-25T2-06 | 18.0 | 25 | 32 | 72 | 93 | 56 | M16X1.5 | |
| 4185-25T2-06 | 18.5 | 25 | 32 | 76 | 97 | 56 | M16X1.5 | |
| 4190-25T2-06 | 19.0 | 25 | 32 | 76 | 97 | 56 | M16X1.5 | |
| 4195-25T2-06 | 19.5 | 25 | 32 | 80 | 103 | 56 | M16X1.5 | |
| 4200-25T2-06 | 20.0 | 25 | 32 | 80 | 103 | 56 | M16X1.5 | |
| 4205-25T2-06 | 20.5 | 25 | 32 | 84 | 107 | 56 | M16X1.5 | |
| 4210-25T2-06 | 21.0 | 25 | 32 | 84 | 107 | 56 | M16X1.5 | |
| 4215-25T2-06 | 21.5 | 25 | 32 | 88 | 111 | 56 | M16X1.5 | |
| 4220-25T2-07 | 22.0 | 25 | 32 | 88 | 111 | 56 | M16X1.5 | SPMG 07... |
| 4225-25T2-07 | 22.5 | 25 | 32 | 92 | 117 | 56 | M16X1.5 | DG/DK |
| 4225-32T2-07 | 22.5 | 32 | 40 | 92 | 117 | 60 | M22X2.0 | SPGG 07..DA |
| 4230-25T2-07 | 23.0 | 25 | 32 | 92 | 117 | 56 | M16X1.5 | D154-155 |
| 4230-32T2-07 | 23.0 | 32 | 40 | 92 | 117 | 60 | M22X2.0 | |
| 4235-25T2-07 | 23.5 | 25 | 32 | 96 | 122 | 56 | M16X1.5 | |
| 4235-32T2-07 | 23.5 | 32 | 40 | 96 | 122 | 60 | M22X2.0 | |
| 4240-25T2-07 | 24.0 | 25 | 32 | 96 | 122 | 56 | M16X1.5 | |
| 4240-32T2-07 | 24.0 | 32 | 40 | 96 | 122 | 60 | M22X2.0 | |
| 4245-25T2-07 | 24.5 | 25 | 32 | 100 | 127 | 56 | M16X1.5 | |
| 4245-32T2-07 | 24.5 | 32 | 40 | 100 | 127 | 60 | M22X2.0 | |
| 4250-25T2-07 | 25.0 | 25 | 32 | 100 | 127 | 56 | M16X1.5 | |
| 4250-32T2-07 | 25.0 | 32 | 40 | 100 | 127 | 60 | M22X2.0 | |
| 4255-25T2-07 | 25.5 | 25 | 32 | 104 | 131 | 56 | M16X1.5 | |
| 4255-32T2-07 | 25.5 | 32 | 40 | 104 | 131 | 60 | M22X2.0 | |
| 4260-25T2-07 | 26.0 | 25 | 32 | 104 | 131 | 56 | M16X1.5 | |

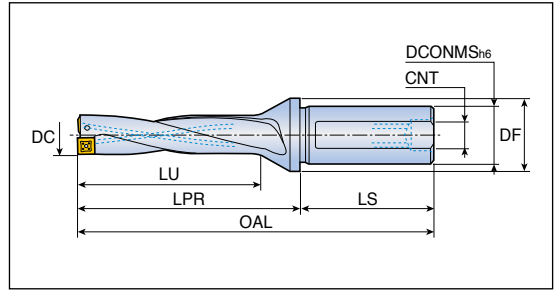
- OAL = LPR+LS



Indexable drill holders



- Drilling depth: 4x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TDR 4260-32T2-07 | 26.0 | 32 | 40 | 104 | 131 | 60 | M22X2.0 | SPMG 07... |
| 4265-25T2-07 | 26.5 | 25 | 32 | 108 | 135 | 56 | M16X1.5 | DG/DK |
| 4265-32T2-07 | 26.5 | 32 | 40 | 108 | 135 | 60 | M22X2.0 | SPGG 07..DA |
| 4270-25T2-07 | 27.0 | 25 | 32 | 108 | 135 | 56 | M16X1.5 | D154-155 |
| 4270-32T2-07 | 27.0 | 32 | 40 | 108 | 135 | 60 | M22X2.0 | |
| 4275-25T2-07 | 27.5 | 25 | 32 | 112 | 140 | 56 | Rc 1/8 | |
| 4275-32T2-07 | 27.5 | 32 | 40 | 112 | 140 | 60 | Rc 1/4 | |
| 4280-25T2-09 | 28.0 | 25 | 40 | 112 | 140 | 56 | Rc 1/8 | SPMG 09... |
| 4280-32T2-09 | 28.0 | 32 | 40 | 112 | 140 | 60 | Rc 1/4 | DG/DK |
| 4285-25T2-09 | 28.5 | 25 | 40 | 116 | 144 | 56 | Rc 1/8 | SPGG 09..DA |
| 4285-32T2-09 | 28.5 | 32 | 40 | 116 | 144 | 60 | Rc 1/4 | D154-155 |
| 4290-25T2-09 | 29.0 | 25 | 40 | 116 | 144 | 56 | Rc 1/8 | |
| 4290-32T2-09 | 29.0 | 32 | 40 | 116 | 144 | 60 | Rc 1/4 | |
| 4295-32T2-09 | 29.5 | 32 | 40 | 120 | 151 | 60 | Rc 1/4 | |
| 4295-40T2-09 | 29.5 | 40 | 50 | 120 | 151 | 70 | Rc 1/4 | |
| 4300-32T2-09 | 30.0 | 32 | 40 | 120 | 151 | 60 | Rc 1/4 | |
| 4300-40T2-09 | 30.0 | 40 | 50 | 120 | 151 | 70 | Rc 1/4 | |
| 4305-32T2-09 | 30.5 | 32 | 40 | 124 | 156 | 60 | Rc 1/4 | |
| 4305-40T2-09 | 30.5 | 40 | 50 | 124 | 156 | 70 | Rc 1/4 | |
| 4310-32T2-09 | 31.0 | 32 | 40 | 124 | 156 | 60 | Rc 1/4 | |
| 4310-40T2-09 | 31.0 | 40 | 50 | 124 | 156 | 70 | Rc 1/4 | |
| 4315-32T2-09 | 31.5 | 32 | 40 | 128 | 160 | 60 | Rc 1/4 | |
| 4315-40T2-09 | 31.5 | 40 | 50 | 128 | 160 | 70 | Rc 1/4 | |
| 4320-32T2-09 | 32.0 | 32 | 40 | 128 | 160 | 60 | Rc 1/4 | |
| 4320-40T2-09 | 32.0 | 40 | 50 | 128 | 160 | 70 | Rc 1/4 | |
| 4325-32T2-09 | 32.5 | 32 | 40 | 132 | 165 | 60 | Rc 1/4 | |
| 4325-40T2-09 | 32.5 | 40 | 50 | 132 | 165 | 70 | Rc 1/4 | |
| 4330-32T2-09 | 33.0 | 32 | 40 | 132 | 165 | 60 | Rc 1/4 | |
| 4330-40T2-09 | 33.0 | 40 | 50 | 132 | 165 | 70 | Rc 1/4 | |
| 4340-32T2-11 | 34.0 | 32 | 50 | 136 | 169 | 60 | Rc 1/4 | SPMG 11... |
| 4340-40T2-11 | 34.0 | 40 | 55 | 136 | 169 | 70 | Rc 1/4 | DG/DK |
| 4350-32T2-11 | 35.0 | 32 | 50 | 140 | 174 | 60 | Rc 1/4 | SPGG 11..DA |
| 4350-40T2-11 | 35.0 | 40 | 55 | 140 | 174 | 70 | Rc 1/4 | D154-155 |
| 4360-32T2-11 | 36.0 | 32 | 50 | 144 | 179 | 60 | Rc 1/4 | |
| 4360-40T2-11 | 36.0 | 40 | 55 | 144 | 179 | 70 | Rc 1/4 | |

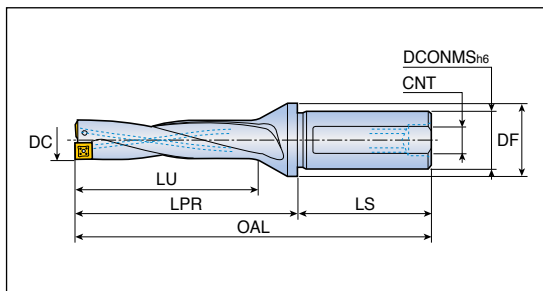
- OAL = LPR+LS



Indexable drill holders



- Drilling depth: 4x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|--------|-------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TDR 4370-32T2-11 | 37.0 | 32 | 50 | 148 | 184 | 60 | Rc 1/4 | SPMG 11... |
| 4370-40T2-11 | 37.0 | 40 | 55 | 148 | 184 | 70 | Rc 1/4 | DG/DK |
| 4380-32T2-11 | 38.0 | 32 | 50 | 152 | 189 | 60 | Rc 1/4 | SPGG 11..DA |
| 4380-40T2-11 | 38.0 | 40 | 55 | 152 | 189 | 70 | Rc 1/4 | D154-155 |
| 4390-32T2-11 | 39.0 | 32 | 50 | 156 | 193 | 60 | Rc 1/4 | |
| 4390-40T2-11 | 39.0 | 40 | 55 | 156 | 193 | 70 | Rc 1/4 | |
| 4400-32T2-11 | 40.0 | 32 | 50 | 160 | 198 | 60 | Rc 1/4 | |
| 4400-40T2-11 | 40.0 | 40 | 55 | 160 | 198 | 70 | Rc 1/4 | |
| 4410-40T2-11 | 41.0 | 40 | 55 | 164 | 203 | 70 | Rc 1/4 | |
| 4420-40T2-14 | 42.0 | 40 | 60 | 168 | 207 | 70 | Rc 1/4 | SPMG 14... |
| 4430-40T2-14 | 43.0 | 40 | 60 | 172 | 212 | 70 | Rc 1/4 | DG/DK |
| 4440-40T2-14 | 44.0 | 40 | 60 | 176 | 216 | 70 | Rc 1/4 | SPGG 14..DA |
| 4450-40T2-14 | 45.0 | 40 | 60 | 180 | 222 | 70 | Rc 1/4 | D154-155 |
| 4460-40T2-14 | 46.0 | 40 | 60 | 184 | 227 | 70 | Rc 1/4 | |
| 4470-40T2-14 | 47.0 | 40 | 60 | 188 | 231 | 70 | Rc 1/4 | |
| 4480-40T2-14 | 48.0 | 40 | 60 | 192 | 236 | 70 | Rc 1/4 | |
| 4490-40T2-14 | 49.0 | 40 | 60 | 196 | 240 | 70 | Rc 1/4 | |
| 4500-40T2-14 | 50.0 | 40 | 60 | 200 | 245 | 70 | Rc 1/4 | |

- OAL = LPR+LS

Spare parts

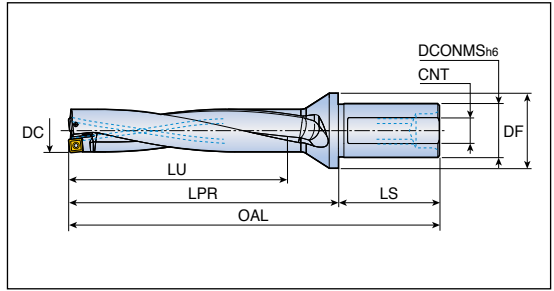
| Designation | Screw | Wrench | Plug | |
|------------------------|----------------|------------|-------------------|--|
| TDR 4125 - 4150 | TS 20043I/HG-P | TD 6P | SL 20 M | |
| TDR 4155 - 4215 | TS 22052I/HG | TD 7 | SL 25 M | |
| TDR 4220 - 4270 | TS 25064I | TD 8 | SL 25 M / SL 32 M | |
| TDR 4275 | TS 25064I | TD 8 | - | |
| TDR 4280 - 4330 | TS 35088I | TD 10 | - | |
| TDR 4340 - 4390 | TS 40093I | TD 15 | - | |
| TDR 4400 - 4410 | TS 40093I | TD 15 | - | |
| TDR 4420 - 4500 | SO 50090I | TD 20 | - | |



Indexable drill holders



- Drilling depth: 5x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|---------|-------------|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TDR 5125-20T2-05 | 12.5 | 20 | 25 | 65 | 83 | 50 | M13X1.0 | SPMG 05... |
| 5130-20T2-05 | 13.0 | 20 | 25 | 65 | 83 | 50 | M13X1.0 | DG/DK |
| 5135-20T2-05 | 13.5 | 20 | 25 | 70 | 88 | 50 | M13X1.0 | SPGG 05..DA |
| 5140-20T2-05 | 14.0 | 20 | 25 | 70 | 88 | 50 | M13X1.0 | D154-155 |
| 5145-20T2-05 | 14.5 | 20 | 25 | 75 | 94 | 50 | M13X1.0 | |
| 5150-20T2-05 | 15.0 | 20 | 25 | 75 | 94 | 50 | M13X1.0 | |
| 5155-25T2-06 | 15.5 | 25 | 32 | 80 | 100 | 56 | M16X1.5 | SPMG 06... |
| 5160-25T2-06 | 16.0 | 25 | 32 | 80 | 100 | 56 | M16X1.5 | DG/DK |
| 5165-25T2-06 | 16.5 | 25 | 32 | 85 | 105 | 56 | M16X1.5 | SPGG 06..DA |
| 5170-25T2-06 | 17.0 | 25 | 32 | 85 | 105 | 56 | M16X1.5 | D154-155 |
| 5175-25T2-06 | 17.5 | 25 | 32 | 90 | 111 | 56 | M16X1.5 | |
| 5180-25T2-06 | 18.0 | 25 | 32 | 90 | 111 | 56 | M16X1.5 | |
| 5185-25T2-06 | 18.5 | 25 | 32 | 95 | 116 | 56 | M16X1.5 | |
| 5190-25T2-06 | 19.0 | 25 | 32 | 95 | 116 | 56 | M16X1.5 | |
| 5195-25T2-06 | 19.5 | 25 | 32 | 100 | 123 | 56 | M16X1.5 | |
| 5200-25T2-06 | 20.0 | 25 | 32 | 100 | 123 | 56 | M16X1.5 | |
| 5205-25T2-06 | 20.5 | 25 | 32 | 105 | 128 | 56 | M16X1.5 | |
| 5210-25T2-06 | 21.0 | 25 | 32 | 105 | 128 | 56 | M16X1.5 | |
| 5215-25T2-06 | 21.5 | 25 | 32 | 110 | 133 | 56 | M16X1.5 | |
| 5220-25T2-07 | 22.0 | 25 | 32 | 110 | 133 | 56 | M22X2.0 | SPMG 07... |
| 5225-32T2-07 | 22.5 | 32 | 40 | 115 | 140 | 60 | M22X2.0 | DG/DK |
| 5230-32T2-07 | 23.0 | 32 | 40 | 115 | 140 | 60 | M22X2.0 | SPGG 07..DA |
| 5235-32T2-07 | 23.5 | 32 | 40 | 120 | 146 | 60 | M22X2.0 | D154-155 |
| 5240-32T2-07 | 24.0 | 32 | 40 | 120 | 146 | 60 | M22X2.0 | |
| 5245-32T2-07 | 24.5 | 32 | 40 | 125 | 152 | 60 | M22X2.0 | |
| 5250-32T2-07 | 25.0 | 32 | 40 | 125 | 152 | 60 | M22X2.0 | |
| 5255-32T2-07 | 25.5 | 32 | 40 | 130 | 157 | 60 | M22X2.0 | |
| 5260-32T2-07 | 26.0 | 32 | 40 | 130 | 157 | 60 | M22X2.0 | |
| 5265-32T2-07 | 26.5 | 32 | 40 | 135 | 162 | 60 | M22X2.0 | |
| 5270-32T2-07 | 27.0 | 32 | 40 | 135 | 162 | 60 | M22X2.0 | |
| 5275-32T2-07 | 27.5 | 32 | 40 | 140 | 168 | 60 | Rc 1/4 | |
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- OAL = LPR+LS



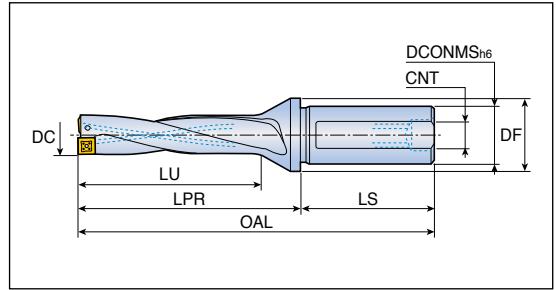
TDR 5...-T2



Indexable drill holders



- Drilling depth: 5x diameter



| Designation | Dimension (mm) | | | | | | | Insert | |
|-------------------------|----------------|--------|----|-----|-----|----|--------|--|--|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | | |
| TDR 5280-32T2-09 | 28.0 | 32 | 40 | 140 | 168 | 60 | Rc 1/4 | SPMG 09... DG/DK SPGG 09..DA D154-155 | |
| 5285-32T2-09 | 28.5 | 32 | 40 | 145 | 173 | 60 | Rc 1/4 | | |
| 5290-32T2-09 | 29.0 | 32 | 40 | 145 | 173 | 60 | Rc 1/4 | | |
| 5295-32T2-09 | 29.5 | 32 | 40 | 150 | 181 | 60 | Rc 1/4 | | |
| 5300-32T2-09 | 30.0 | 32 | 40 | 150 | 181 | 60 | Rc 1/4 | | |
| 5300-40T2-09 | 30.0 | 40 | 50 | 150 | 181 | 70 | Rc 1/4 | | |
| 5310-32T2-09 | 31.0 | 32 | 40 | 155 | 187 | 60 | Rc 1/4 | | |
| 5310-40T2-09 | 31.0 | 40 | 50 | 155 | 187 | 70 | Rc 1/4 | | |
| 5320-32T2-09 | 32.0 | 32 | 40 | 160 | 192 | 60 | Rc 1/4 | | |
| 5320-40T2-09 | 32.0 | 40 | 50 | 160 | 192 | 70 | Rc 1/4 | | |
| 5330-32T2-09 | 33.0 | 32 | 40 | 165 | 198 | 60 | Rc 1/4 | SPMG 11... DG/DK SPGG 11..DA D154-155 | |
| 5330-40T2-09 | 33.0 | 40 | 50 | 165 | 198 | 70 | Rc 1/4 | | |
| 5340-32T2-11 | 34.0 | 32 | 50 | 170 | 203 | 60 | Rc 1/4 | | |
| 5340-40T2-11 | 34.0 | 40 | 55 | 170 | 203 | 70 | Rc 1/4 | | |
| 5350-32T2-11 | 35.0 | 32 | 50 | 175 | 209 | 60 | Rc 1/4 | | |
| 5350-40T2-11 | 35.0 | 40 | 55 | 175 | 209 | 70 | Rc 1/4 | | |
| 5360-32T2-11 | 36.0 | 32 | 50 | 180 | 215 | 60 | Rc 1/4 | | |
| 5360-40T2-11 | 36.0 | 40 | 55 | 180 | 215 | 70 | Rc 1/4 | | |
| 5370-32T2-11 | 37.0 | 32 | 50 | 185 | 221 | 60 | Rc 1/4 | | |
| 5370-40T2-11 | 37.0 | 40 | 55 | 185 | 221 | 70 | Rc 1/4 | | |
| 5380-32T2-11 | 38.0 | 32 | 50 | 190 | 227 | 60 | Rc 1/4 | | |
| 5380-40T2-11 | 38.0 | 40 | 55 | 190 | 227 | 70 | Rc 1/4 | | |
| 5390-32T2-11 | 39.0 | 32 | 50 | 195 | 232 | 60 | Rc 1/4 | | |
| 5390-40T2-11 | 39.0 | 40 | 55 | 195 | 232 | 70 | Rc 1/4 | | |
| 5400-32T2-11 | 40.0 | 32 | 50 | 200 | 238 | 60 | Rc 1/4 | | |
| 5400-40T2-11 | 40.0 | 40 | 55 | 200 | 238 | 70 | Rc 1/4 | | |
| 5410-40T2-11 | 41.0 | 40 | 55 | 205 | 244 | 70 | Rc 1/4 | | |
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- OAL = LPR+LS



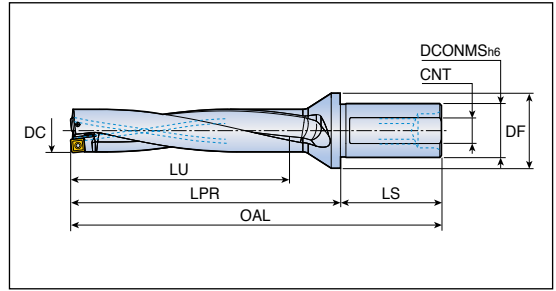
TDR 5...-T2



Indexable drill holders



- Drilling depth: 5x diameter



| Designation | Dimension (mm) | | | | | | | Insert |
|-------------------------|----------------|--------|----|-----|-----|----|--------|--|
| | DC | DCONMS | DF | LU | LPR | LS | CNT | |
| TDR 5420-40T2-14 | 42.0 | 40 | 60 | 210 | 249 | 70 | Rc 1/4 | SPMG 14... DG/DK SPGG 14..DA D154-155 |
| 5430-40T2-14 | 43.0 | 40 | 60 | 215 | 255 | 70 | Rc 1/4 | |
| 5440-40T2-14 | 44.0 | 40 | 60 | 220 | 260 | 70 | Rc 1/4 | |
| 5450-40T2-14 | 45.0 | 40 | 60 | 225 | 267 | 70 | Rc 1/4 | |
| 5460-40T2-14 | 46.0 | 40 | 60 | 230 | 273 | 70 | Rc 1/4 | |
| 5470-40T2-14 | 47.0 | 40 | 60 | 235 | 278 | 70 | Rc 1/4 | |
| 5480-40T2-14 | 48.0 | 40 | 60 | 240 | 284 | 70 | Rc 1/4 | |
| 5490-40T2-14 | 49.0 | 40 | 60 | 245 | 289 | 70 | Rc 1/4 | |
| 5500-40T2-14 | 50.0 | 40 | 60 | 250 | 295 | 70 | Rc 1/4 | |
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- OAL = LPR+LS

Spare parts

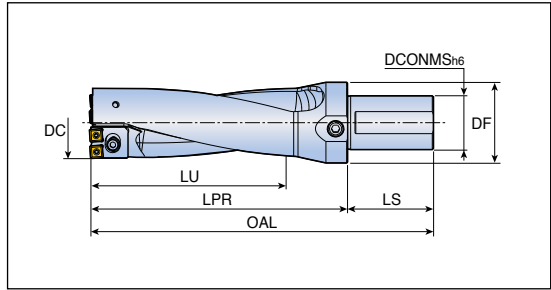
| Designation | Screw | Wrench | Plug | |
|------------------------|----------------|--------|-------------------|--|
| | | | | |
| TDR 5125 - 5150 | TS 20043I/HG-P | TD 6P | SL 20 M | |
| TDR 5155 - 5215 | TS 22052I/HG | TD 7 | SL 25 M | |
| TDR 5220 - 5270 | TS 25064I | TD 8 | SL 25 M / SL 32 M | |
| TDR 5275 | TS 25064I | TD 8 | - | |
| TDR 5280 - 5330 | TS 35088I | TD 10 | - | |
| TDR 5340 - 5390 | TS 40093I | TD 15 | - | |
| TDR 5400 - 5410 | TS 40093I | TD 15 | - | |
| TDR 5420 - 5500 | SO 50090I | TD 20 | - | |



TDR 25...CA-T



Indexable cartridge drill holders



- Drilling depth: 2.5x diameter



| Designation | Dimension (mm) | | | | | | Setting plate | Insert |
|--------------------------------|----------------|--------|----|-----|-----|----|---------------|--|
| | DC | DCONMS | DF | LU | LPR | LS | | |
| TDR 2551-53-50T2-07CA-T | 51 | 50 | 75 | 133 | 170 | 80 | - | SPMG 07... DG/DK SPGG 07..DA D154-155 |
| | 52 | 50 | 75 | 133 | 170 | 80 | TDP-0701 | |
| | 53 | 50 | 75 | 133 | 170 | 80 | TDP-0702 | |
| 2554-56-50T2-07CA-T | 54 | 50 | 75 | 140 | 180 | 80 | - | SPMG 07... DG/DK SPGG 07..DA D154-155 |
| | 55 | 50 | 75 | 140 | 180 | 80 | TDP-0701 | |
| | 56 | 50 | 75 | 140 | 180 | 80 | TDP-0702 | |
| 2557-62-50T2-09CA-T | 57 | 50 | 75 | 155 | 201 | 80 | - | SPMG 09... DG/DK SPGG 09..DA D154-155 |
| | 58 | 50 | 75 | 155 | 201 | 80 | TDP-0901 | |
| | 59 | 50 | 75 | 155 | 201 | 80 | TDP-0902 | |
| | 60 | 50 | 75 | 155 | 201 | 80 | TDP-0903 | |
| | 61 | 50 | 75 | 155 | 201 | 80 | TDP-0904 | |
| | 62 | 50 | 75 | 155 | 201 | 80 | TDP-0905 | |
| 2563-66-50T2-09CA-T | 63 | 50 | 75 | 165 | 215 | 80 | - | SPMG 09... DG/DK SPGG 09..DA D154-155 |
| | 64 | 50 | 75 | 165 | 215 | 80 | TDP-0901 | |
| | 65 | 50 | 75 | 165 | 215 | 80 | TDP-0902 | |
| | 66 | 50 | 75 | 165 | 215 | 80 | TDP-0903 | |
| 2567-73-50T2-11CA-T | 67 | 50 | 75 | 183 | 240 | 80 | - | SPMG 11... DG/DK SPGG 11..DA D154-155 |
| | 68 | 50 | 75 | 183 | 240 | 80 | TDP-1101 | |
| | 69 | 50 | 75 | 183 | 240 | 80 | TDP-1102 | |
| | 70 | 50 | 75 | 183 | 240 | 80 | TDP-1103 | |
| | 71 | 50 | 75 | 183 | 240 | 80 | TDP-1104 | |
| | 72 | 50 | 75 | 183 | 240 | 80 | TDP-1105 | |
| | 73 | 50 | 75 | 183 | 240 | 80 | TDP-1106 | |
| 2574-80-50T2-12CA-T | 74 | 50 | 75 | 200 | 250 | 80 | - | SPMG 12...DG D154 |
| | 75 | 50 | 75 | 200 | 250 | 80 | TDP-1101 | |
| | 76 | 50 | 75 | 200 | 250 | 80 | TDP-1102 | |
| | 77 | 50 | 75 | 200 | 250 | 80 | TDP-1103 | |
| | 78 | 50 | 75 | 200 | 250 | 80 | TDP-1104 | |
| | 79 | 50 | 75 | 200 | 250 | 80 | TDP-1105 | |
| | 80 | 50 | 75 | 200 | 250 | 80 | TDP-1106 | |
| | | | | | | | | |



- OAL = LPR+LS

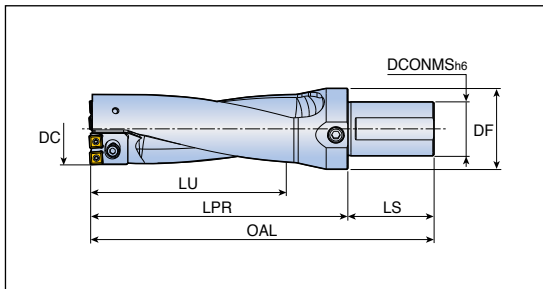
TDR 35...CA-T



Indexable cartridge drill holders



• Drilling depth: 3.5xdiameter



| Designation | Dimension (mm) | | | | | | Setting plate | Insert |
|--------------------------------|----------------|--------|----|-----|-----|----|---------------|------------------------------------|
| | DC | DCONMS | DF | LU | LPR | LS | | |
| TDR 3551-53-50T2-07CA-T | 51 | 50 | 75 | 186 | 223 | 80 | - | SPMG 07... DG/DK SPGG 07..DA |
| | 52 | 50 | 75 | 186 | 223 | 80 | TDP-0701 | D154-155 |
| | 53 | 50 | 75 | 186 | 223 | 80 | TDP-0702 | |
| 3554-56-50T2-07CA-T | 54 | 50 | 75 | 196 | 236 | 80 | - | SPMG 07... DG/DK SPGG 07..DA |
| | 55 | 50 | 75 | 196 | 236 | 80 | TDP-0701 | D154-155 |
| | 56 | 50 | 75 | 196 | 236 | 80 | TDP-0702 | |
| 3557-62-50T2-09CA-T | 57 | 50 | 75 | 217 | 263 | 80 | - | SPMG 09... DG/DK SPGG 09..DA |
| | 58 | 50 | 75 | 217 | 263 | 80 | TDP-0901 | D154-155 |
| | 59 | 50 | 75 | 217 | 263 | 80 | TDP-0902 | |
| | 60 | 50 | 75 | 217 | 263 | 80 | TDP-0903 | |
| | 61 | 50 | 75 | 217 | 263 | 80 | TDP-0904 | |
| | 62 | 50 | 75 | 217 | 263 | 80 | TDP-0905 | |
| 3563-66-50T2-09CA-T | 63 | 50 | 75 | 231 | 281 | 80 | - | |
| | 64 | 50 | 75 | 231 | 281 | 80 | TDP-0901 | D154-155 |
| | 65 | 50 | 75 | 231 | 281 | 80 | TDP-0902 | |
| | 66 | 50 | 75 | 231 | 281 | 80 | TDP-0903 | |
| 3567-73-50T2-11CA-T | 67 | 50 | 75 | 256 | 313 | 80 | - | |
| | 68 | 50 | 75 | 256 | 313 | 80 | TDP-1101 | D154-155 |
| | 69 | 50 | 75 | 256 | 313 | 80 | TDP-1102 | |
| | 70 | 50 | 75 | 256 | 313 | 80 | TDP-1103 | |
| | 71 | 50 | 75 | 256 | 313 | 80 | TDP-1104 | |
| | 72 | 50 | 75 | 256 | 313 | 80 | TDP-1105 | |
| | 73 | 50 | 75 | 256 | 313 | 80 | TDP-1106 | |
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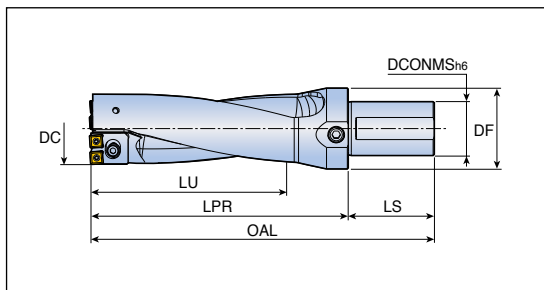
• OAL = LPR+LS



Indexable cartridge drill holders



- Drilling depth: 3.5x diameter



| Designation | Dimension (mm) | | | | | | Setting plate | Insert |
|--------------------------------|----------------|--------|-----|-----|-----|----------|---------------|----------------------|
| | DC | DCONMS | DF | LU | LPR | LS | | |
| TDR 3574-80-50T2-12CA-T | 74 | 50 | 75 | 280 | 330 | 80 | - | SPMG 12...DG D154 |
| | 75 | 50 | 75 | 280 | 330 | 80 | TDP-1101 | |
| | 76 | 50 | 75 | 280 | 330 | 80 | TDP-1102 | |
| | 77 | 50 | 75 | 280 | 330 | 80 | TDP-1103 | |
| | 78 | 50 | 75 | 280 | 330 | 80 | TDP-1104 | |
| | 79 | 50 | 75 | 280 | 330 | 80 | TDP-1105 | |
| 80 | 50 | 75 | 280 | 330 | 80 | TDP-1106 | | |

- OAL = LPR+LS

Spare parts

| Designation | Screw | Cartridge for peripheral | Cartridge for center |
|-----------------------|-----------|--------------------------|----------------------|
| | | | |
| TDR.. 51-53... | TS 25064I | TDR 07CA-P1-T | TDR 07CA-C1-T |
| TDR.. 54-56... | TS 25064I | TDR 07CA-P2-T | TDR 07CA-C2-T |
| TDR.. 57-62... | TS 35088I | TDR 09CA-P1-T | TDR 09CA-C1-T |
| TDR.. 63-66... | TS 35088I | TDR 09CA-P2-T | TDR 09CA-C2-T |
| TDR.. 67-73... | TS 40093I | TDR 11CA-P1-T | TDR 11CA-C1-T |
| TDR.. 74-80... | TS 40093I | TDR 12CA-P2-T | TDR 12CA-C2-T |

Spare parts for cartridges

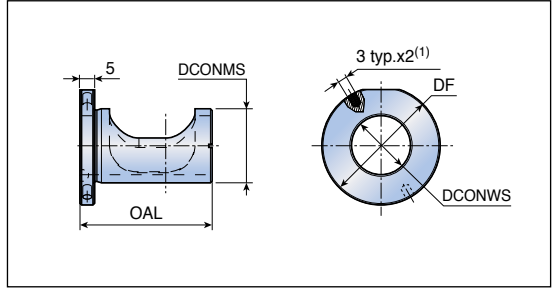
| Designation | Cartridge clamping screw | Washer | Setting plate screw |
|----------------------|--------------------------|-----------|---------------------|
| TDR 07CA-P1-T | SH M4x0.7x16 | MW 4.3x8 | TS 20043I/HG-P |
| TDR 07CA-C1-T | SH M4x0.7x16 | MW 4.3x8 | - |
| TDR 07CA-P2-T | SH M4x0.7x16 | MW 4.3x8 | TS 20043I/HG-P |
| TDR 07CA-C2-T | SH M4x0.7x16 | MW 4.3x8 | - |
| TDR 09CA-P1-T | SH M5x0.8x16 | MW 5.5x10 | SO 30055I |
| TDR 09CA-C1-T | SH M5x0.8x16 | MW 5.5x10 | - |
| TDR 09CA-P2-T | SH M5x0.8x16 | MW 5.5x10 | SO 30055I |
| TDR 09CA-C2-T | SH M5x0.8x16 | MW 5.5x10 | - |
| TDR 11CA-P1-T | SH M6x1.0x20 | MW 6.4x12 | SO 30055I |
| TDR 11CA-C1-T | SH M6x1.0x20 | MW 6.4x12 | - |
| TDR 12CA-P2-T | SH M6x1.0x20 | MW 6.4x12 | SO 30055I |
| TDR 12CA-C2-T | SH M6x1.0x20 | MW 6.4x12 | - |



ECCENTER SLEEVE



Drill center adjustment sleeves / eccentric sleeve



| Designation | Dimension (mm) | | | |
|------------------------------|----------------|--------|----|-----|
| | DCONWS | DCONMS | DF | OAL |
| ECCENTER SLEEVE 20x25 | 20 | 25 | 40 | 44 |
| 25x32 | 25 | 32 | 50 | 46 |
| 32x40 | 32 | 40 | 65 | 55 |
| 40x50 | 40 | 50 | 75 | 62 |
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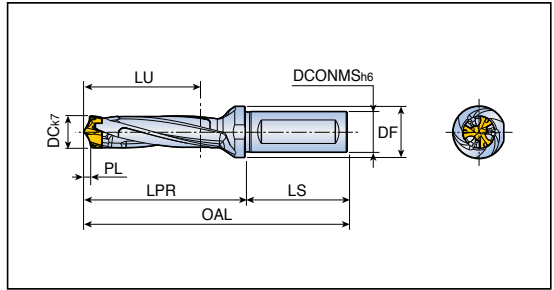
• ⁽¹⁾ Holes for inserting a pin are used to facilitate radial adjustment of the sleeve (Pin is not supplied)

3ED...T...-3D

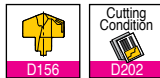
Head changeable 3 flute drill holders - Weldon type shank



- Drilling depth: 3xdiameter



| Designation | Dimension (mm) | | | | | | | | Clamping key |
|----------------------------|----------------|--------|----|----|------|----|------|-----|---------------|
| | DC | DCONMS | DF | LU | LPR | LS | PL | SSC | |
| 3ED 150-159-20T3-3D | 15.0-15.9 | 20 | 25 | 49 | 73.9 | 50 | 3.31 | 15 | K 3ED D14-D15 |
| 160-169-20T3-3D | 16.0-16.9 | 20 | 25 | 52 | 79.0 | 50 | 3.70 | 16 | K 3ED D16-D17 |
| 170-179-20T3-3D | 17.0-17.9 | 20 | 25 | 55 | 84.0 | 50 | 3.88 | 17 | K 3ED D16-D17 |
| 180-189-25T2-3D | 18.0-18.9 | 25 | 32 | 58 | 90.1 | 56 | 4.07 | 18 | K 3ED D18-D19 |
| 190-199-25T2-3D | 19.0-19.9 | 25 | 32 | 61 | 94.7 | 56 | 4.26 | 19 | K 3ED D18-D19 |
| 200-209-25T2-3D | 20.0-20.9 | 25 | 32 | 64 | 99.3 | 56 | 4.44 | 20 | K 3ED D20-D21 |



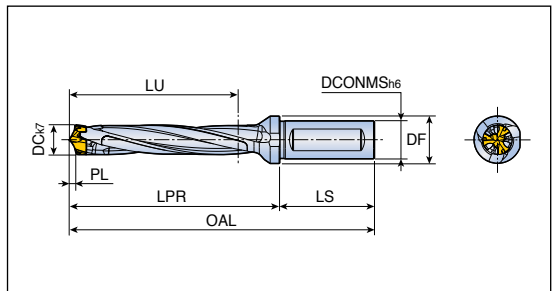
- OAL = LPR+LS
- SSC : Seat size code

3ED...T...-5D

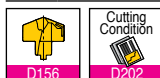
Head changeable 3 flute drill holders - Weldon type shank



- Drilling depth: 5xdiameter



| Designation | Dimension (mm) | | | | | | | | Clamping key |
|----------------------------|----------------|--------|----|-----|-------|----|------|-----|---------------|
| | DC | DCONMS | DF | LU | LPR | LS | PL | SSC | |
| 3ED 150-159-20T3-5D | 15.0-15.9 | 20 | 25 | 79 | 103.9 | 50 | 3.31 | 15 | K 3ED D14-D15 |
| 160-169-20T3-5D | 16.0-16.9 | 20 | 25 | 84 | 111.0 | 50 | 3.70 | 16 | K 3ED D16-D17 |
| 170-179-20T3-5D | 17.0-17.9 | 20 | 25 | 89 | 118.0 | 50 | 3.88 | 17 | K 3ED D16-D17 |
| 180-189-25T2-5D | 18.0-18.9 | 25 | 32 | 94 | 126.1 | 56 | 4.07 | 18 | K 3ED D18-D19 |
| 190-199-25T2-5D | 19.0-19.9 | 25 | 32 | 99 | 132.7 | 56 | 4.26 | 19 | K 3ED D18-D19 |
| 200-209-25T2-5D | 20.0-20.9 | 25 | 32 | 104 | 139.3 | 56 | 4.44 | 20 | K 3ED D20-D21 |



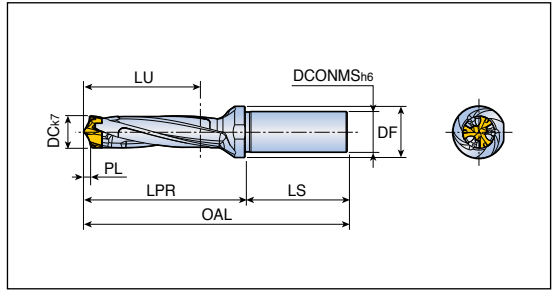
- OAL = LPR+LS
- SSC : Seat size code

3ED...T0...-3D

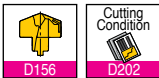
Head changeable 3 flute drill holders - Cylindrical type shank



- Drilling depth: 3xdiameter



| Designation | Dimension (mm) | | | | | | | | Clamping key |
|----------------------------|----------------|--------|----|----|------|----|------|-----|---------------|
| | DC | DCONMS | DF | LU | LPR | LS | PL | SSC | |
| 3ED 150-159-20T0-3D | 15.0-15.9 | 20 | 25 | 49 | 73.9 | 50 | 3.31 | 15 | K 3ED D14-D15 |
| 160-169-20T0-3D | 16.0-16.9 | 20 | 25 | 52 | 79.0 | 50 | 3.70 | 16 | K 3ED D16-D17 |
| 170-179-20T0-3D | 17.0-17.9 | 20 | 25 | 55 | 84.0 | 50 | 3.88 | 17 | K 3ED D16-D17 |
| 180-189-25T0-3D | 18.0-18.9 | 25 | 32 | 58 | 90.1 | 56 | 4.07 | 18 | K 3ED D18-D19 |
| 190-199-25T0-3D | 19.0-19.9 | 25 | 32 | 61 | 94.7 | 56 | 4.26 | 19 | K 3ED D18-D19 |
| 200-209-25T0-3D | 20.0-20.9 | 25 | 32 | 64 | 99.3 | 56 | 4.44 | 20 | K 3ED D20-D21 |



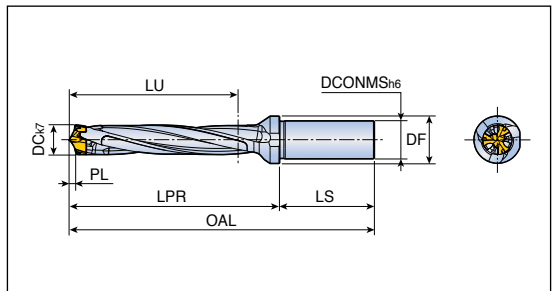
- OAL = LPR+LS
- SSC : Seat size code

3ED...T0...-5D

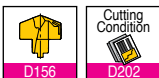
Head changeable 3 flute drill holders - Cylindrical type shank



- Drilling depth: 5xdiameter



| Designation | Dimension (mm) | | | | | | | | Clamping key |
|----------------------------|----------------|--------|----|-----|-------|----|------|-----|---------------|
| | DC | DCONMS | DF | LU | LPR | LS | PL | SSC | |
| 3ED 150-159-20T0-5D | 15.0-15.9 | 20 | 25 | 79 | 103.9 | 50 | 3.31 | 15 | K 3ED D14-D15 |
| 160-169-20T0-5D | 16.0-16.9 | 20 | 25 | 84 | 111.0 | 50 | 3.70 | 16 | K 3ED D16-D17 |
| 170-179-20T0-5D | 17.0-17.9 | 20 | 25 | 89 | 118.0 | 50 | 3.88 | 17 | K 3ED D16-D17 |
| 180-189-25T0-5D | 18.0-18.9 | 25 | 32 | 94 | 126.1 | 56 | 4.07 | 18 | K 3ED D18-D19 |
| 190-199-25T0-5D | 19.0-19.9 | 25 | 32 | 99 | 132.7 | 56 | 4.26 | 19 | K 3ED D18-D19 |
| 200-209-25T0-5D | 20.0-20.9 | 25 | 32 | 104 | 139.3 | 56 | 4.44 | 20 | K 3ED D20-D21 |



- OAL = LPR+LS
- SSC : Seat size code

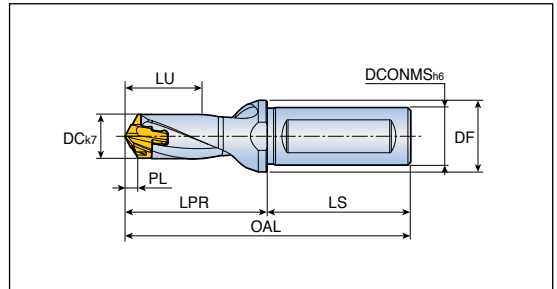
TCD...T...-1.5D



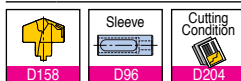
Head changeable drill holders - Weldon type shank



- Drilling depth: 1.5x diameter



| Designation | Dimension (mm) | | | | | | | | Clamping key | |
|------------------------------|----------------|--------|----|----|------|----|------|-----|-----------------|-----------------|
| | DC | DCONMS | DF | LU | LPR | LS | PL | SSC | | |
| TCD 060-064-12T3-1.5D | 6.0-6.4 | 12 | 16 | 10 | 23.0 | 45 | 0.96 | 6 | K TCD D060-D099 | |
| 065-069-12T3-1.5D | 6.5-6.9 | 12 | 16 | 11 | 24.1 | 45 | 1.18 | 6.5 | | |
| 070-074-12T3-1.5D | 7.0-7.4 | 12 | 16 | 12 | 25.1 | 45 | 1.01 | 7 | | |
| 075-079-12T3-1.5D | 7.5-7.9 | 12 | 16 | 12 | 25.9 | 45 | 1.10 | 7 | | |
| 080-089-12T3-1.5D | 8.0-8.9 | 12 | 16 | 13 | 27.4 | 45 | 1.20 | 8 | | |
| 090-099-12T3-1.5D | 9.0-9.9 | 12 | 16 | 15 | 29.3 | 45 | 1.35 | 9 | | |
| 100-109-16T3-1.5D | 10.0-10.9 | 16 | 20 | 17 | 31.2 | 48 | 1.50 | 10 | | K TCD D100-D199 |
| 110-119-16T3-1.5D | 11.0-11.9 | 16 | 20 | 19 | 33.1 | 48 | 1.67 | 11 | | |
| 120-129-16T3-1.5D | 12.0-12.9 | 16 | 20 | 20 | 35.0 | 48 | 1.82 | 12 | | |
| 130-139-16T3-1.5D | 13.0-13.9 | 16 | 20 | 22 | 37.1 | 48 | 1.96 | 13 | | |
| 140-149-16T3-1.5D | 14.0-14.9 | 16 | 20 | 23 | 41.1 | 48 | 2.12 | 14 | | |
| 150-159-20T3-1.5D | 15.0-15.9 | 20 | 25 | 25 | 46.2 | 50 | 2.27 | 15 | | |
| 160-169-20T3-1.5D | 16.0-16.9 | 20 | 25 | 26 | 49.3 | 50 | 2.42 | 16 | | |
| 170-179-20T3-1.5D | 17.0-17.9 | 20 | 25 | 29 | 52.4 | 50 | 2.59 | 17 | | |
| 180-189-25T2-1.5D | 18.0-18.9 | 25 | 32 | 30 | 55.5 | 56 | 2.73 | 18 | | |
| 190-199-25T2-1.5D | 19.0-19.9 | 25 | 32 | 32 | 58.5 | 56 | 2.88 | 19 | K TCD D200-D269 | |
| 200-209-25T2-1.5D | 20.0-20.9 | 25 | 32 | 33 | 61.6 | 56 | 3.02 | 20 | | |
| 210-219-25T2-1.5D | 21.0-21.9 | 25 | 32 | 35 | 64.7 | 56 | 3.18 | 21 | | |
| 220-229-25T2-1.5D | 22.0-22.9 | 25 | 32 | 36 | 67.8 | 56 | 3.24 | 22 | | |
| 230-239-32T2-1.5D | 23.0-23.9 | 32 | 42 | 38 | 70.8 | 60 | 3.46 | 23 | | |
| 240-249-32T2-1.5D | 24.0-24.9 | 32 | 42 | 40 | 73.9 | 60 | 3.62 | 24 | | |
| 250-259-32T2-1.5D | 25.0-25.9 | 32 | 42 | 42 | 77.0 | 60 | 3.80 | 25 | | |
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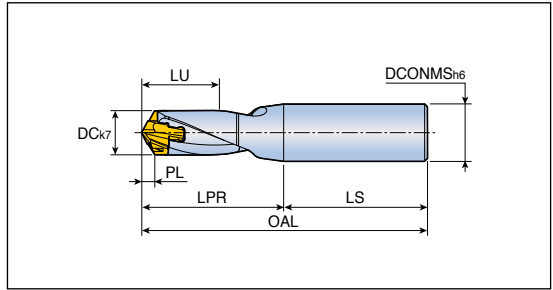
- OAL = LPR+LS
- SSC : Seat size code

TCD...S0-1.5D

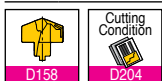
Head changeable drill holders - Cylindrical type shank



- Drilling depth: 1.5xdiameter



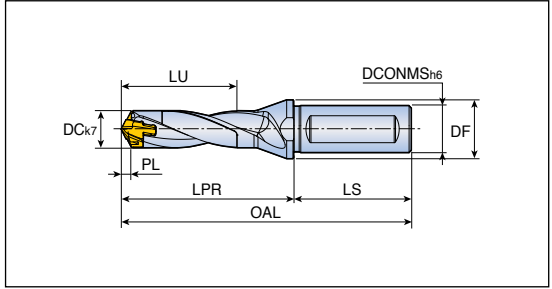
| Designation | Dimension (mm) | | | | | | | Clamping key |
|------------------------------|----------------|--------|----|------|----|------|-----|-----------------|
| | DC | DCONMS | LU | LPR | LS | PL | SSC | |
| TCD 060-064-12S0-1.5D | 6.0-6.4 | 12 | 10 | 23.0 | 45 | 0.96 | 6 | K TCD D060-D099 |
| 065-069-12S0-1.5D | 6.5-6.9 | 12 | 11 | 24.1 | 45 | 1.18 | 6.5 | |
| 070-074-12S0-1.5D | 7.0-7.4 | 12 | 12 | 25.1 | 45 | 1.01 | 7 | |
| 075-079-12S0-1.5D | 7.5-7.9 | 12 | 12 | 25.9 | 45 | 1.10 | 7 | |
| 080-089-12S0-1.5D | 8.0-8.9 | 12 | 13 | 27.4 | 45 | 1.20 | 8 | |
| 090-099-12S0-1.5D | 9.0-9.9 | 12 | 15 | 29.3 | 45 | 1.35 | 9 | K TCD D100-D199 |
| 100-109-16S0-1.5D | 10.0-10.9 | 16 | 17 | 31.2 | 48 | 1.50 | 10 | |
| 110-119-16S0-1.5D | 11.0-11.9 | 16 | 19 | 33.1 | 48 | 1.67 | 11 | |
| 120-129-16S0-1.5D | 12.0-12.9 | 16 | 20 | 35.0 | 48 | 1.82 | 12 | |
| 130-139-16S0-1.5D | 13.0-13.9 | 16 | 22 | 37.1 | 48 | 1.96 | 13 | |
| 140-149-16S0-1.5D | 14.0-14.9 | 16 | 23 | 41.1 | 48 | 2.12 | 14 | |
| 150-159-20S0-1.5D | 15.0-15.9 | 20 | 25 | 46.2 | 50 | 2.27 | 15 | |
| 160-169-20S0-1.5D | 16.0-16.9 | 20 | 26 | 49.3 | 50 | 2.42 | 16 | |
| 170-179-20S0-1.5D | 17.0-17.9 | 20 | 29 | 52.4 | 50 | 2.59 | 17 | |
| 180-189-25S0-1.5D | 18.0-18.9 | 25 | 30 | 55.5 | 56 | 2.73 | 18 | |
| 190-199-25S0-1.5D | 19.0-19.9 | 25 | 32 | 58.5 | 56 | 2.88 | 19 | K TCD D200-D269 |
| 200-209-25S0-1.5D | 20.0-20.9 | 25 | 33 | 61.6 | 56 | 3.02 | 20 | |
| 210-219-25S0-1.5D | 21.0-21.9 | 25 | 35 | 64.7 | 56 | 3.18 | 21 | |
| 220-229-25S0-1.5D | 22.0-22.9 | 25 | 36 | 67.8 | 56 | 3.24 | 22 | |
| 230-239-32S0-1.5D | 23.0-23.9 | 32 | 38 | 70.8 | 60 | 3.46 | 23 | |
| 240-249-32S0-1.5D | 24.0-24.9 | 32 | 40 | 73.9 | 60 | 3.62 | 24 | |
| 250-259-32S0-1.5D | 25.0-25.9 | 32 | 42 | 77.0 | 60 | 3.80 | 25 | |
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- OAL = LPR+LS
- SSC : Seat size code

TCD...T...-3D

Head changeable drill holders - Weldon type shank



- Drilling depth: 3xdiameter



| Designation | Dimension (mm) | | | | | | | | Clamping key | |
|----------------------------|----------------|--------|----|----|-------|----|------|-----|-----------------|-----------------|
| | DC | DCONMS | DF | LU | LPR | LS | PL | SSC | | |
| TCD 060-064-12T3-3D | 6.0-6.4 | 12 | 16 | 19 | 32.0 | 45 | 0.96 | 6 | K TCD D060-D099 | |
| 065-069-12T3-3D | 6.5-6.9 | 12 | 16 | 21 | 33.8 | 45 | 1.18 | 6.5 | | |
| 070-074-12T3-3D | 7.0-7.4 | 12 | 16 | 22 | 35.6 | 45 | 1.01 | 7 | | |
| 075-079-12T3-3D | 7.5-7.9 | 12 | 16 | 24 | 37.1 | 45 | 1.10 | 7 | | |
| 080-084-12T3-3D | 8.0-8.4 | 12 | 16 | 25 | 39.4 | 45 | 1.20 | 8 | | |
| 085-089-12T3-3D | 8.5-8.9 | 12 | 16 | 27 | 40.9 | 45 | 1.29 | 8 | | |
| 090-094-12T3-3D | 9.0-9.4 | 12 | 16 | 28 | 42.8 | 45 | 1.35 | 9 | | |
| 095-099-12T3-3D | 9.5-9.9 | 12 | 16 | 30 | 44.3 | 45 | 1.44 | 9 | | |
| 100-104-16T3-3D | 10.0-10.4 | 16 | 20 | 32 | 46.2 | 48 | 1.50 | 10 | | K TCD D100-D199 |
| 105-109-16T3-3D | 10.5-10.9 | 16 | 20 | 34 | 47.7 | 48 | 1.59 | 10 | | |
| 110-114-16T3-3D | 11.0-11.4 | 16 | 20 | 35 | 49.6 | 48 | 1.67 | 11 | | |
| 115-119-16T3-3D | 11.5-11.9 | 16 | 20 | 37 | 51.1 | 48 | 1.76 | 11 | | |
| 120-124-16T3-3D | 12.0-12.4 | 16 | 20 | 38 | 53.0 | 48 | 1.82 | 12 | | |
| 125-129-16T3-3D | 12.5-12.9 | 16 | 20 | 39 | 54.5 | 48 | 1.91 | 12 | | |
| 130-134-16T3-3D | 13.0-13.4 | 16 | 20 | 41 | 56.6 | 48 | 1.96 | 13 | | |
| 135-139-16T3-3D | 13.5-13.9 | 16 | 20 | 43 | 58.1 | 48 | 2.05 | 13 | | |
| 140-144-16T3-3D | 14.0-14.4 | 16 | 20 | 44 | 62.2 | 48 | 2.12 | 14 | | |
| 145-149-16T3-3D | 14.5-14.9 | 16 | 20 | 46 | 63.7 | 48 | 2.21 | 14 | | |
| 150-159-20T3-3D | 15.0-15.9 | 20 | 25 | 47 | 68.7 | 50 | 2.27 | 15 | K TCD D200-D269 | |
| 160-169-20T3-3D | 16.0-16.9 | 20 | 25 | 50 | 73.3 | 50 | 2.42 | 16 | | |
| 170-179-20T3-3D | 17.0-17.9 | 20 | 25 | 54 | 77.9 | 50 | 2.59 | 17 | | |
| 180-189-25T2-3D | 18.0-18.9 | 25 | 32 | 57 | 82.5 | 56 | 2.73 | 18 | | |
| 190-199-25T2-3D | 19.0-19.9 | 25 | 32 | 60 | 87.0 | 56 | 2.88 | 19 | | |
| 200-209-25T2-3D | 20.0-20.9 | 25 | 32 | 63 | 91.6 | 56 | 3.02 | 20 | | |
| 210-219-25T2-3D | 21.0-21.9 | 25 | 32 | 66 | 96.2 | 56 | 3.18 | 21 | | |
| 220-229-25T2-3D | 22.0-22.9 | 25 | 32 | 69 | 100.8 | 56 | 3.24 | 22 | | |
| 230-239-32T2-3D | 23.0-23.9 | 32 | 42 | 72 | 105.3 | 60 | 3.46 | 23 | | |
| 240-249-32T2-3D | 24.0-24.9 | 32 | 42 | 76 | 109.9 | 60 | 3.62 | 24 | | |
| 250-259-32T2-3D | 25.0-25.9 | 32 | 42 | 79 | 114.5 | 60 | 3.80 | 25 | | |
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D158

Sleeve

D96

Cutting Condition

D204

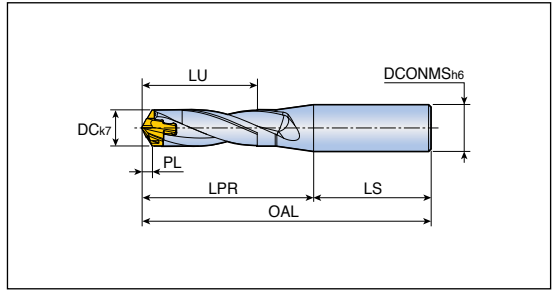
- OAL = LPR+LS
- SSC : Seat size code

TCD...S0-3D

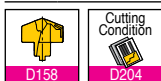
Head changeable drill holders - Cylindrical type shank



- Drilling depth: 3x diameter



| Designation | Dimension (mm) | | | | | | | Clamping key | |
|----------------------------|----------------|--------|----|-------|----|------|-----|-----------------|-----------------|
| | DC | DCONMS | LU | LPR | LS | PL | SSC | | |
| TCD 060-064-12S0-3D | 6.0-6.4 | 12 | 19 | 32.0 | 45 | 0.96 | 6 | K TCD D060-D099 | |
| 065-069-12S0-3D | 6.5-6.9 | 12 | 21 | 33.8 | 45 | 1.18 | 6.5 | | |
| 070-074-12S0-3D | 7.0-7.4 | 12 | 22 | 35.6 | 45 | 1.01 | 7 | | |
| 075-079-12S0-3D | 7.5-7.9 | 12 | 24 | 37.1 | 45 | 1.10 | 7 | | |
| 080-084-12S0-3D | 8.0-8.4 | 12 | 25 | 39.4 | 45 | 1.20 | 8 | | |
| 085-089-12S0-3D | 8.5-8.9 | 12 | 27 | 40.9 | 45 | 1.29 | 8 | | |
| 090-094-12S0-3D | 9.0-9.4 | 12 | 28 | 42.8 | 45 | 1.35 | 9 | | |
| 095-099-12S0-3D | 9.5-9.9 | 12 | 30 | 44.3 | 45 | 1.44 | 9 | | |
| 100-104-16S0-3D | 10.0-10.4 | 16 | 32 | 46.2 | 48 | 1.50 | 10 | | K TCD D100-D199 |
| 105-109-16S0-3D | 10.5-10.9 | 16 | 34 | 47.7 | 48 | 1.59 | 10 | | |
| 110-114-16S0-3D | 11.0-11.4 | 16 | 35 | 49.6 | 48 | 1.67 | 11 | | |
| 115-119-16S0-3D | 11.5-11.9 | 16 | 37 | 51.1 | 48 | 1.76 | 11 | | |
| 120-124-16S0-3D | 12.0-12.4 | 16 | 38 | 53.0 | 48 | 1.82 | 12 | | |
| 125-129-16S0-3D | 12.5-12.9 | 16 | 39 | 54.5 | 48 | 1.91 | 12 | | |
| 130-134-16S0-3D | 13.0-13.4 | 16 | 41 | 56.6 | 48 | 1.96 | 13 | | |
| 135-139-16S0-3D | 13.5-13.9 | 16 | 43 | 58.1 | 48 | 2.05 | 13 | | |
| 140-144-16S0-3D | 14.0-14.4 | 16 | 44 | 62.1 | 48 | 2.12 | 14 | | |
| 145-149-16S0-3D | 14.5-14.9 | 16 | 46 | 63.7 | 48 | 2.21 | 14 | | |
| 150-159-20S0-3D | 15.0-15.9 | 20 | 47 | 68.7 | 50 | 2.27 | 15 | K TCD D200-D269 | |
| 160-169-20S0-3D | 16.0-16.9 | 20 | 50 | 73.3 | 50 | 2.42 | 16 | | |
| 170-179-20S0-3D | 17.0-17.9 | 20 | 54 | 77.9 | 50 | 2.59 | 17 | | |
| 180-189-25S0-3D | 18.0-18.9 | 25 | 57 | 82.5 | 56 | 2.73 | 18 | | |
| 190-199-25S0-3D | 19.0-19.9 | 25 | 60 | 87.0 | 56 | 2.88 | 19 | | |
| 200-209-25S0-3D | 20.0-20.9 | 25 | 63 | 91.6 | 56 | 3.02 | 20 | | |
| 210-219-25S0-3D | 21.0-21.9 | 25 | 66 | 96.2 | 56 | 3.18 | 21 | | |
| 220-229-25S0-3D | 22.0-22.9 | 25 | 69 | 100.8 | 56 | 3.24 | 22 | | |
| 230-239-32S0-3D | 23.0-23.9 | 32 | 72 | 105.3 | 60 | 3.46 | 23 | | |
| 240-249-32S0-3D | 24.0-24.9 | 32 | 76 | 109.9 | 60 | 3.62 | 24 | | |
| 250-259-32S0-3D | 25.0-25.9 | 32 | 79 | 114.5 | 60 | 3.80 | 25 | | |
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- OAL = LPR+LS
- SSC : Seat size code

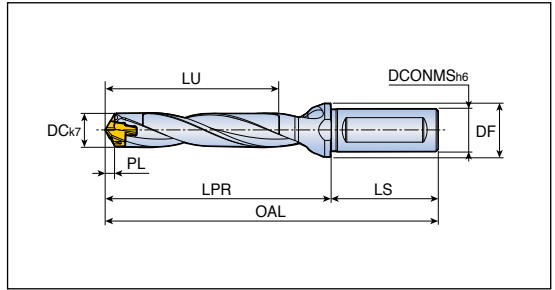
TCD...T...-5D



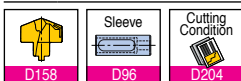
Head changeable drill holders - Weldon type shank



- Drilling depth: 5x diameter



| Designation | Dimension (mm) | | | | | | | | Clamping key | |
|----------------------------|----------------|--------|----|-----|-------|----|------|-----|-----------------|-----------------|
| | DC | DCONMS | DF | LU | LPR | LS | PL | SSC | | |
| TCD 060-064-12T3-5D | 6.0-6.4 | 12 | 16 | 31 | 44.0 | 45 | 0.96 | 6 | K TCD D060-D099 | |
| 065-069-12T3-5D | 6.5-6.9 | 12 | 16 | 34 | 46.8 | 45 | 1.18 | 6.5 | | |
| 070-074-12T3-5D | 7.0-7.4 | 12 | 16 | 36 | 49.6 | 45 | 1.01 | 7 | | |
| 075-079-12T3-5D | 7.5-7.9 | 12 | 16 | 39 | 52.1 | 45 | 1.10 | 7 | | |
| 080-084-12T3-5D | 8.0-8.4 | 12 | 16 | 41 | 55.4 | 45 | 1.20 | 8 | | |
| 085-089-12T3-5D | 8.5-8.9 | 12 | 16 | 44 | 57.9 | 45 | 1.29 | 8 | | |
| 090-094-12T3-5D | 9.0-9.4 | 12 | 16 | 46 | 60.8 | 45 | 1.35 | 9 | | |
| 095-099-12T3-5D | 9.5-9.9 | 12 | 16 | 49 | 63.3 | 45 | 1.44 | 9 | | |
| 100-104-16T3-5D | 10.0-10.4 | 16 | 20 | 52 | 66.2 | 48 | 1.50 | 10 | | K TCD D100-D199 |
| 105-109-16T3-5D | 10.5-10.9 | 16 | 20 | 55 | 68.7 | 48 | 1.59 | 10 | | |
| 110-114-16T3-5D | 11.0-11.4 | 16 | 20 | 57 | 71.6 | 48 | 1.67 | 11 | | |
| 115-119-16T3-5D | 11.5-11.9 | 16 | 20 | 60 | 74.1 | 48 | 1.76 | 11 | | |
| 120-124-16T3-5D | 12.0-12.4 | 16 | 20 | 62 | 77.0 | 48 | 1.82 | 12 | | |
| 125-129-16T3-5D | 12.5-12.9 | 16 | 20 | 64 | 79.5 | 48 | 1.91 | 12 | | |
| 130-134-16T3-5D | 13.0-13.4 | 16 | 20 | 67 | 82.6 | 48 | 1.96 | 13 | | |
| 135-139-16T3-5D | 13.5-13.9 | 16 | 20 | 70 | 85.1 | 48 | 2.05 | 13 | | |
| 140-144-16T3-5D | 14.0-14.4 | 16 | 20 | 72 | 90.2 | 48 | 2.12 | 14 | | |
| 145-149-16T3-5D | 14.5-14.9 | 16 | 20 | 75 | 92.7 | 48 | 2.21 | 14 | | |
| 150-159-20T3-5D | 15.0-15.9 | 20 | 25 | 77 | 98.7 | 50 | 2.27 | 15 | K TCD D200-D269 | |
| 160-169-20T3-5D | 16.0-16.9 | 20 | 25 | 82 | 105.3 | 50 | 2.42 | 16 | | |
| 170-179-20T3-5D | 17.0-17.9 | 20 | 25 | 88 | 111.9 | 50 | 2.59 | 17 | | |
| 180-189-25T2-5D | 18.0-18.9 | 25 | 32 | 93 | 118.5 | 56 | 2.73 | 18 | | |
| 190-199-25T2-5D | 19.0-19.9 | 25 | 32 | 98 | 125.0 | 56 | 2.88 | 19 | | |
| 200-209-25T2-5D | 20.0-20.9 | 25 | 32 | 103 | 131.6 | 56 | 3.02 | 20 | | |
| 210-219-25T2-5D | 21.0-21.9 | 25 | 32 | 108 | 138.2 | 56 | 3.18 | 21 | | |
| 220-229-25T2-5D | 22.0-22.9 | 25 | 32 | 113 | 144.8 | 56 | 3.24 | 22 | | |
| 230-239-32T2-5D | 23.0-23.9 | 32 | 42 | 118 | 151.3 | 60 | 3.46 | 23 | | |
| 240-249-32T2-5D | 24.0-24.9 | 32 | 42 | 124 | 157.9 | 60 | 3.62 | 24 | | |
| 250-259-32T2-5D | 25.0-25.9 | 32 | 42 | 129 | 164.5 | 60 | 3.80 | 25 | | |
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- OAL = LPR+LS
- SSC : Seat size code

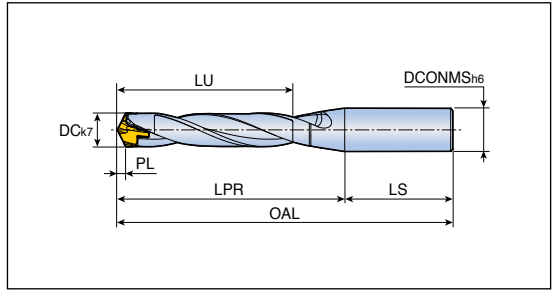
TCD...S0-5D



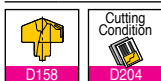
Head changeable drill holders - Cylindrical type shank



- Drilling depth: 5x diameter



| Designation | Dimension (mm) | | | | | | | Clamping key | |
|----------------------------|----------------|--------|-----|-------|----|------|-----|-----------------|-----------------|
| | DC | DCONMS | LU | LPR | LS | PL | SSC | | |
| TCD 060-064-12S0-5D | 6.0-6.4 | 12 | 31 | 44.0 | 45 | 0.96 | 6 | K TCD D060-D099 | |
| 065-069-12S0-5D | 6.5-6.9 | 12 | 34 | 46.8 | 45 | 1.18 | 6.5 | | |
| 070-074-12S0-5D | 7.0-7.4 | 12 | 36 | 49.6 | 45 | 1.01 | 7 | | |
| 075-079-12S0-5D | 7.5-7.9 | 12 | 39 | 52.1 | 45 | 1.10 | 7 | | |
| 080-084-12S0-5D | 8.0-8.4 | 12 | 41 | 55.4 | 45 | 1.20 | 8 | | |
| 085-089-12S0-5D | 8.5-8.9 | 12 | 44 | 57.9 | 45 | 1.29 | 8 | | |
| 090-094-12S0-5D | 9.0-9.4 | 12 | 46 | 60.8 | 45 | 1.35 | 9 | | |
| 095-099-12S0-5D | 9.5-9.9 | 12 | 49 | 63.3 | 45 | 1.44 | 9 | | |
| 100-104-16S0-5D | 10.0-10.4 | 16 | 52 | 66.2 | 48 | 1.50 | 10 | | K TCD D100-D199 |
| 105-109-16S0-5D | 10.5-10.9 | 16 | 55 | 68.7 | 48 | 1.59 | 10 | | |
| 110-114-16S0-5D | 11.0-11.4 | 16 | 57 | 71.6 | 48 | 1.67 | 11 | | |
| 115-119-16S0-5D | 11.5-11.9 | 16 | 60 | 74.1 | 48 | 1.76 | 11 | | |
| 120-124-16S0-5D | 12.0-12.4 | 16 | 62 | 77.0 | 48 | 1.82 | 12 | | |
| 125-129-16S0-5D | 12.5-12.9 | 16 | 64 | 79.5 | 48 | 1.91 | 12 | | |
| 130-134-16S0-5D | 13.0-13.4 | 16 | 67 | 82.6 | 48 | 1.96 | 13 | | |
| 135-139-16S0-5D | 13.5-13.9 | 16 | 70 | 85.1 | 48 | 2.05 | 13 | | |
| 140-144-16S0-5D | 14.0-14.4 | 16 | 72 | 90.2 | 48 | 2.12 | 14 | | |
| 145-149-16S0-5D | 14.5-14.9 | 16 | 75 | 92.7 | 48 | 2.21 | 14 | | |
| 150-159-20S0-5D | 15.0-15.9 | 20 | 77 | 98.7 | 50 | 2.27 | 15 | K TCD D200-D269 | |
| 160-169-20S0-5D | 16.0-16.9 | 20 | 82 | 105.3 | 50 | 2.42 | 16 | | |
| 170-179-20S0-5D | 17.0-17.9 | 20 | 88 | 111.9 | 50 | 2.59 | 17 | | |
| 180-189-25S0-5D | 18.0-18.9 | 25 | 93 | 118.5 | 56 | 2.73 | 18 | | |
| 190-199-25S0-5D | 19.0-19.9 | 25 | 98 | 125.0 | 56 | 2.88 | 19 | | |
| 200-209-25S0-5D | 20.0-20.9 | 25 | 103 | 131.6 | 56 | 3.02 | 20 | | |
| 210-219-25S0-5D | 21.0-21.9 | 25 | 108 | 138.2 | 56 | 3.18 | 21 | | |
| 220-229-25S0-5D | 22.0-22.9 | 25 | 113 | 144.8 | 56 | 3.24 | 22 | | |
| 230-239-32S0-5D | 23.0-23.9 | 32 | 118 | 151.3 | 60 | 3.46 | 23 | | |
| 240-249-32S0-5D | 24.0-24.9 | 32 | 124 | 157.9 | 60 | 3.62 | 24 | | |
| 250-259-32S0-5D | 25.0-25.9 | 32 | 129 | 164.5 | 60 | 3.80 | 25 | | |
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- OAL = LPR+LS
- SSC : Seat size code

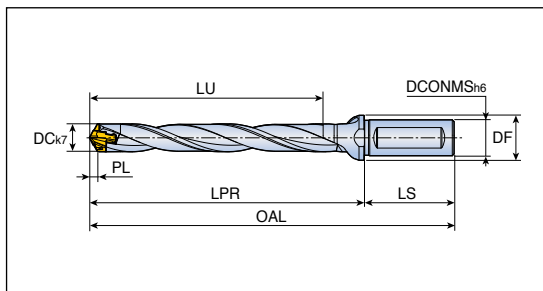
TCD...T...-8D



Head changeable drill holders - Weldon type shank



- Drilling depth: 8x diameter



| Designation | Dimension (mm) | | | | | | | | Clamping key | |
|----------------------------|----------------|--------|----|-----|-------|----|------|-----|-----------------|-----------------|
| | DC | DCONMS | DF | LU | LPR | LS | PL | SSC | | |
| TCD 070-074-12T3-8D | 7.0-7.4 | 12 | 16 | 57 | 70.6 | 45 | 1.01 | 7 | K TCD D060-D099 | |
| 075-079-12T3-8D | 7.5-7.9 | 12 | 16 | 61 | 74.6 | 45 | 1.10 | 7 | | |
| 080-084-12T3-8D | 8.0-8.4 | 12 | 16 | 65 | 79.4 | 45 | 1.20 | 8 | | |
| 085-089-12T3-8D | 8.5-8.9 | 12 | 16 | 69 | 83.4 | 45 | 1.29 | 8 | | |
| 090-094-12T3-8D | 9.0-9.4 | 12 | 16 | 73 | 87.8 | 45 | 1.35 | 9 | | |
| 095-099-12T3-8D | 9.5-9.9 | 12 | 16 | 77 | 91.8 | 45 | 1.44 | 9 | | |
| 100-104-16T3-8D | 10.0-10.4 | 16 | 20 | 82 | 96.2 | 48 | 1.50 | 10 | | K TCD D100-D199 |
| 105-109-16T3-8D | 10.5-10.9 | 16 | 20 | 86 | 100.2 | 48 | 1.59 | 10 | | |
| 110-114-16T3-8D | 11.0-11.4 | 16 | 20 | 90 | 104.6 | 48 | 1.67 | 11 | | |
| 115-119-16T3-8D | 11.5-11.9 | 16 | 20 | 94 | 108.6 | 48 | 1.76 | 11 | | |
| 120-124-16T3-8D | 12.0-12.4 | 16 | 20 | 98 | 113.0 | 48 | 1.82 | 12 | | |
| 125-129-16T3-8D | 12.5-12.9 | 16 | 20 | 102 | 117.0 | 48 | 1.91 | 12 | | |
| 130-134-16T3-8D | 13.0-13.4 | 16 | 20 | 106 | 121.6 | 48 | 1.96 | 13 | | |
| 135-139-16T3-8D | 13.5-13.9 | 16 | 20 | 110 | 125.6 | 48 | 2.05 | 13 | | |
| 140-144-16T3-8D | 14.0-14.4 | 16 | 20 | 114 | 132.2 | 48 | 2.12 | 14 | | |
| 145-149-16T3-8D | 14.5-14.9 | 16 | 20 | 118 | 136.2 | 48 | 2.21 | 14 | | |
| 150-159-20T3-8D | 15.0-15.9 | 20 | 25 | 122 | 143.7 | 50 | 2.27 | 15 | K TCD D200-D269 | |
| 160-169-20T3-8D | 16.0-16.9 | 20 | 25 | 130 | 153.3 | 50 | 2.42 | 16 | | |
| 170-179-20T3-8D | 17.0-17.9 | 20 | 25 | 139 | 162.9 | 50 | 2.59 | 17 | | |
| 180-189-25T2-8D | 18.0-18.9 | 25 | 32 | 147 | 172.5 | 56 | 2.73 | 18 | | |
| 190-199-25T2-8D | 19.0-19.9 | 25 | 32 | 155 | 182.0 | 56 | 2.88 | 19 | | |
| 200-209-25T2-8D | 20.0-20.9 | 25 | 32 | 163 | 191.6 | 56 | 3.02 | 20 | | |
| 210-219-25T2-8D | 21.0-21.9 | 25 | 32 | 171 | 201.2 | 56 | 3.18 | 21 | | |
| 220-229-25T2-8D | 22.0-22.9 | 25 | 32 | 179 | 210.8 | 56 | 3.24 | 22 | | |
| 230-239-32T2-8D | 23.0-23.9 | 32 | 42 | 187 | 220.3 | 60 | 3.46 | 23 | | |
| 240-249-32T2-8D | 24.0-24.9 | 32 | 42 | 196 | 229.9 | 60 | 3.62 | 24 | | |
| 250-259-32T2-8D | 25.0-25.9 | 32 | 42 | 204 | 239.5 | 60 | 3.80 | 25 | | |
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D158

D96

D204

- It is recommended to make the pilot hole with a 1.5D holder
- OAL = LPR+LS
- SSC : Seat size code

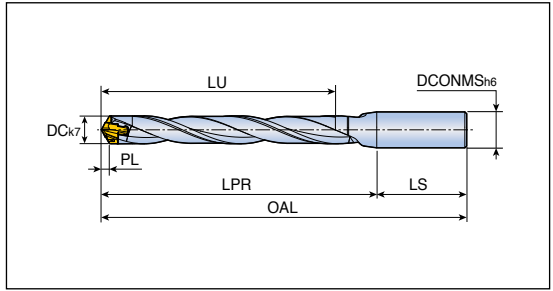
TCD...S0-8D



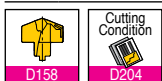
Head changeable drill holders - Cylindrical type shank



- Drilling depth: 8x diameter



| Designation | Dimension (mm) | | | | | | | Clamping key |
|----------------------------|----------------|--------|-----|-------|----|------|-----|-----------------|
| | DC | DCONMS | LU | LPR | LS | PL | SSC | |
| TCD 070-074-12S0-8D | 7.0-7.4 | 12 | 57 | 70.6 | 45 | 1.01 | 7 | K TCD D060-D099 |
| 075-079-12S0-8D | 7.5-7.9 | 12 | 61 | 74.6 | 45 | 1.10 | 7 | |
| 080-084-12S0-8D | 8.0-8.4 | 12 | 65 | 79.4 | 45 | 1.20 | 8 | |
| 085-089-12S0-8D | 8.5-8.9 | 12 | 69 | 83.4 | 45 | 1.29 | 8 | |
| 090-094-12S0-8D | 9.0-9.4 | 12 | 73 | 87.8 | 45 | 1.35 | 9 | |
| 095-099-12S0-8D | 9.5-9.9 | 12 | 77 | 91.8 | 45 | 1.44 | 9 | |
| 100-104-16S0-8D | 10.0-10.4 | 16 | 82 | 96.2 | 48 | 1.50 | 10 | K TCD D100-D199 |
| 105-109-16S0-8D | 10.5-10.9 | 16 | 86 | 100.2 | 48 | 1.59 | 10 | |
| 110-114-16S0-8D | 11.0-11.4 | 16 | 90 | 104.6 | 48 | 1.67 | 11 | |
| 115-119-16S0-8D | 11.5-11.9 | 16 | 94 | 108.6 | 48 | 1.76 | 11 | |
| 120-124-16S0-8D | 12.0-12.4 | 16 | 98 | 113.0 | 48 | 1.82 | 12 | |
| 125-129-16S0-8D | 12.5-12.9 | 16 | 102 | 117.0 | 48 | 1.91 | 12 | |
| 130-134-16S0-8D | 13.0-13.4 | 16 | 106 | 121.6 | 48 | 1.96 | 13 | |
| 135-139-16S0-8D | 13.5-13.9 | 16 | 110 | 125.6 | 48 | 2.05 | 13 | |
| 140-144-16S0-8D | 14.0-14.4 | 16 | 114 | 132.2 | 48 | 2.12 | 14 | |
| 145-149-16S0-8D | 14.5-14.9 | 16 | 118 | 136.2 | 48 | 2.21 | 14 | |
| 150-159-20S0-8D | 15.0-15.9 | 20 | 122 | 143.7 | 50 | 2.27 | 15 | K TCD D200-D269 |
| 160-169-20S0-8D | 16.0-16.9 | 20 | 130 | 153.3 | 50 | 2.42 | 16 | |
| 170-179-20S0-8D | 17.0-17.9 | 20 | 139 | 162.9 | 50 | 2.59 | 17 | |
| 180-189-25S0-8D | 18.0-18.9 | 25 | 147 | 172.5 | 56 | 2.73 | 18 | |
| 190-199-25S0-8D | 19.0-19.9 | 25 | 155 | 182.0 | 56 | 2.88 | 19 | |
| 200-209-25S0-8D | 20.0-20.9 | 25 | 163 | 191.6 | 56 | 3.02 | 20 | |
| 210-219-25S0-8D | 21.0-21.9 | 25 | 171 | 201.2 | 56 | 3.18 | 21 | |
| 220-229-25S0-8D | 22.0-22.9 | 25 | 179 | 210.8 | 56 | 3.24 | 22 | |
| 230-239-32S0-8D | 23.0-23.9 | 32 | 187 | 220.3 | 60 | 3.46 | 23 | |
| 240-249-32S0-8D | 24.0-24.9 | 32 | 196 | 229.9 | 60 | 3.62 | 24 | |
| 250-259-32S0-8D | 25.0-25.9 | 32 | 204 | 239.5 | 60 | 3.80 | 25 | |
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- It is recommended to make the pilot hole with a 1.5D holder
- OAL = LPR+LS
- SSC : Seat size code

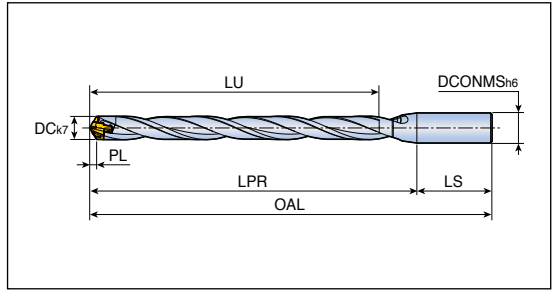
TCD...S0-12D



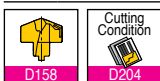
Head changeable drill holders - Cylindrical type shank



- Drilling depth: 12xdiameter

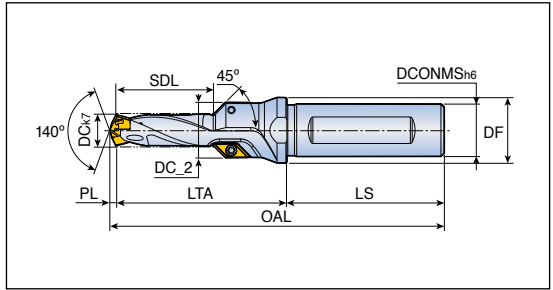
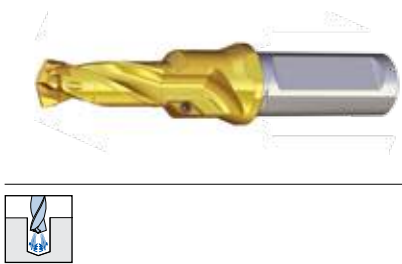


| Designation | Dimension (mm) | | | | | | | Clamping key |
|-----------------------------|----------------|--------|-----|-------|----|------|-----|-----------------|
| | DC | DCONMS | LU | LPR | LS | PL | SSC | |
| TCD 080-084-12S0-12D | 8.0-8.4 | 12 | 97 | 111.4 | 45 | 1.20 | 8 | K TCD D060-D099 |
| 085-089-12S0-12D | 8.5-8.9 | 12 | 103 | 117.4 | 45 | 1.29 | 8 | |
| 090-094-12S0-12D | 9.0-9.4 | 12 | 109 | 123.8 | 45 | 1.35 | 9 | |
| 095-099-12S0-12D | 9.5-9.9 | 12 | 115 | 129.8 | 45 | 1.44 | 9 | |
| 100-104-16S0-12D | 10.0-10.4 | 16 | 122 | 136.2 | 48 | 1.50 | 10 | K TCD D100-D199 |
| 105-109-16S0-12D | 10.5-10.9 | 16 | 128 | 142.2 | 48 | 1.59 | 10 | |
| 110-114-16S0-12D | 11.0-11.4 | 16 | 134 | 148.6 | 48 | 1.67 | 11 | |
| 115-119-16S0-12D | 11.5-11.9 | 16 | 140 | 154.6 | 48 | 1.76 | 11 | |
| 120-124-16S0-12D | 12.0-12.4 | 16 | 146 | 161.0 | 48 | 1.82 | 12 | |
| 125-129-16S0-12D | 12.5-12.9 | 16 | 152 | 167.0 | 48 | 1.91 | 12 | |
| 130-134-16S0-12D | 13.0-13.4 | 16 | 158 | 173.6 | 48 | 1.96 | 13 | |
| 135-139-16S0-12D | 13.5-13.9 | 16 | 164 | 179.6 | 48 | 2.05 | 13 | |
| 140-144-16S0-12D | 14.0-14.4 | 16 | 170 | 188.2 | 48 | 2.12 | 14 | |
| 145-149-16S0-12D | 14.5-14.9 | 16 | 176 | 194.2 | 48 | 2.21 | 14 | |
| 150-159-20S0-12D | 15.0-15.9 | 20 | 182 | 203.7 | 50 | 2.27 | 15 | K TCD D200-D269 |
| 160-169-20S0-12D | 16.0-16.9 | 20 | 194 | 217.3 | 50 | 2.42 | 16 | |
| 170-179-20S0-12D | 17.0-17.9 | 20 | 207 | 230.9 | 50 | 2.59 | 17 | |
| 180-189-25S0-12D | 18.0-18.9 | 25 | 219 | 244.5 | 56 | 2.73 | 18 | |
| 190-199-25S0-12D | 19.0-19.9 | 25 | 221 | 258.0 | 56 | 2.88 | 19 | |
| 200-209-25S0-12D | 20.0-20.9 | 25 | 243 | 271.6 | 56 | 3.02 | 20 | |
| 210-219-25S0-12D | 21.0-21.9 | 25 | 255 | 285.2 | 56 | 3.18 | 21 | |
| 220-229-25S0-12D | 22.0-22.9 | 25 | 267 | 298.8 | 56 | 3.24 | 22 | |
| 230-239-32S0-12D | 23.0-23.9 | 32 | 289 | 312.3 | 60 | 3.46 | 23 | |
| 240-249-32S0-12D | 24.0-24.9 | 32 | 292 | 325.9 | 60 | 3.62 | 24 | |
| 250-259-32S0-12D | 25.0-25.9 | 32 | 304 | 339.5 | 60 | 3.80 | 25 | |
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- It is recommended to make the pilot hole with a 1.5D holder
- OAL = LPR+LS
- SSC : Seat size code

Head changeable drill holders for pre-thread hole

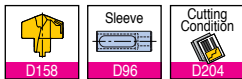


| Designation | ISO thread | DC | Dimension (mm) | | | | | | | Drill dia. range | Insert |
|---------------------------|------------|------|----------------|-------|----|------|--------|----|------|------------------|------------------------|
| | | | SDL | LTA | LS | DC_2 | DCONMS | DF | PL | | |
| TCD 068x21x12T3-M8 | M8 | 6.8 | 21 | 43.77 | 45 | 13.5 | 12 | 16 | 1.23 | 6.5-6.9 | AOMT 06...-C45 D172 |
| 085x26x12T3-M10 | M10 | 8.5 | 26 | 48.71 | 45 | 15.5 | 12 | 16 | 1.29 | 8.5-8.9 | |
| 102x30x16T3-M12 | M12 | 10.2 | 30 | 52.46 | 48 | 17.0 | 16 | 20 | 1.54 | 10.0-10.4 | |
| 120x35x16T3-M14 | M14 | 12.0 | 35 | 59.18 | 48 | 19.0 | 16 | 20 | 1.82 | 12.0-12.4 | |
| 140x39x20T3-M16 | M16 | 14.0 | 39 | 66.88 | 50 | 21.0 | 20 | 25 | 2.12 | 14.0-14.4 | |
| 175x42x20T3-M20 | M20 | 17.5 | 42 | 69.32 | 50 | 24.5 | 20 | 27 | 2.68 | 17.0-17.9 | |
| 210x48x25T2-M24 | M24 | 21.0 | 48 | 76.82 | 56 | 28.0 | 25 | 32 | 3.18 | 21.0-21.9 | |

• OAL = LTA+LS+PL

Spare parts

| Designation | Screw | Wrench | Clamping key | |
|----------------------|-----------|------------|------------------|--|
| TCD 068 | TS 22046I | TD 7 | K TCD D060-D099 | |
| TCD 085 | TS 22046I | TD 7 | K TCD D060-D099 | |
| TCD 102 - 175 | TS 22046I | TD 7 | K TCD D100-D199 | |
| TCD 210 | TS 22046I | TD 7 | K TCD D200-D269 | |
| | | | | |

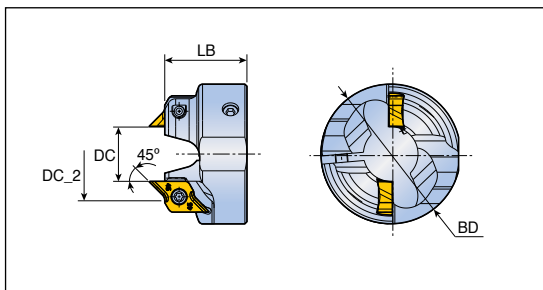


Plug for coolant supply in a stationary machines

TaeguTec supplies special plugs with an internal thread for coolant connections used on lathes that can be pressed into the cavity on the back end of the shank.

| Description | Shank diameter | Internal thread | |
|-------------|----------------|-----------------|--|
| PL-TCD-12 | 12 | G 1/16 | |
| PL-TCD-16 | 16 | G 1/16 | |
| PL-TCD-20 | 20 | G 1/8 | |
| PL-TCD-25 | 25 | G 1/8 | |
| PL-TCD-32 | 32 | G 1/8 | |

Chamfering ring tools



| Designation | Dimension (mm) | | | | Chamfer size | Chamfer insert |
|---------------------|----------------|-------|----|----|--------------|-------------------------|
| | DC | DC_2 | BD | LB | | |
| CFR D100-A45 | 9.8 | 16.56 | 34 | 20 | 2.5 | CRNG 08...-45CD D172 |
| D105-A45 | 10.3 | 17.06 | 34 | 20 | 2.5 | |
| D110-A45 | 10.8 | 17.56 | 34 | 20 | 2.5 | |
| D115-A45 | 11.3 | 18.06 | 34 | 20 | 2.5 | |
| D120-A45 | 11.8 | 18.56 | 34 | 20 | 2.5 | |
| D125-A45 | 12.3 | 19.06 | 34 | 20 | 2.5 | |
| D130-A45 | 12.8 | 19.56 | 34 | 20 | 2.5 | |
| D135-A45 | 13.3 | 20.06 | 34 | 20 | 2.5 | |
| D140-A45 | 13.8 | 20.56 | 38 | 22 | 2.5 | |
| D145-A45 | 14.3 | 21.06 | 38 | 22 | 2.5 | |
| D150-A45 | 14.6 | 21.36 | 38 | 22 | 2.5 | |
| D160-A45 | 15.6 | 22.36 | 42 | 23 | 2.5 | |
| D170-A45 | 16.6 | 23.36 | 42 | 23 | 2.5 | |
| D180-A45 | 17.6 | 24.36 | 42 | 23 | 2.5 | |
| D190-A45 | 18.6 | 25.36 | 42 | 24 | 2.5 | |
| D200-A45 | 19.6 | 26.36 | 42 | 24 | 2.5 | |
| D210-A45 | 20.6 | 27.36 | 47 | 24 | 2.5 | |
| D220-A45 | 21.6 | 28.36 | 47 | 24 | 2.5 | |
| D230-A45 | 22.6 | 29.36 | 47 | 24 | 2.5 | |
| D240-A45 | 23.6 | 30.36 | 47 | 24 | 2.5 | |
| D250-A45 | 24.6 | 31.36 | 47 | 24 | 2.5 | |

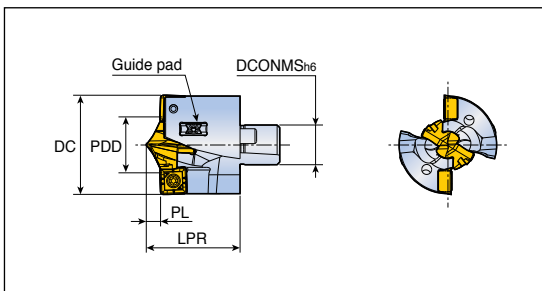
Spare parts

| Designation | Insert screw | Wrench | Clamping screw | L-wrench |
|------------------------|------------------|------------|-----------------------------|--------------|
| CFR D100 - D135 | SO 25065I | TD 7 | SH M3x0.5x10 ⁽¹⁾ | L-W2.5 |
| CFR D140 - D150 | SO 25065I | TD 7 | SH M4x0.7x12 ⁽²⁾ | L-W3 |
| CFR D160 - D250 | SO 25065I | TD 7 | SH M5x0.8x16 ⁽³⁾ | L-W4 |
| | | | | |
| | | | | |

- ⁽¹⁾ Clamping torque: 2-3 [N·m] ⁽²⁾ Clamping torque: 3.5-4.5 [N·m] ⁽³⁾ Clamping torque: 5-6 [N·m]



Modular drill heads



| Designation | Dimension (mm) | | | | | Clamping Key | Insert | |
|-------------------------|----------------|--------|------|------|------|------------------|---------------|--------------|
| | DC | DCONMS | LPR | PL | PDD | | Center | Outer |
| TNDH 2600-C26-TP | 26 | 10.4 | 24.9 | 3.98 | 15.9 | K TCD D15-D16 CO | TCD-159-P-CO+ | SPGX 06...DW |
| 2700-C26-TP | 27 | 10.4 | 25.4 | 4.14 | 16.9 | K TCD D15-D16 CO | TCD-169-P-CO+ | SPGX 06...DW |
| 2800-C28-TP | 28 | 11.2 | 26.9 | 4.29 | 17.9 | K TCD D17-D19 CO | TCD-179-P-CO+ | SPGX 06...DW |
| 2900-C28-TP | 29 | 11.2 | 26.6 | 3.97 | 15.9 | K TCD D15-D16 CO | TCD-159-P-CO+ | SPGX 07...DW |
| 3000-C30-TP | 30 | 12.0 | 28.3 | 4.14 | 16.9 | K TCD D15-D16 CO | TCD-169-P-CO+ | SPGX 07...DW |
| 3100-C30-TP | 31 | 12.0 | 28.5 | 4.30 | 17.9 | K TCD D17-D19 CO | TCD-179-P-CO+ | SPGX 07...DW |
| 3200-C32-TP | 32 | 12.8 | 30.3 | 4.46 | 18.9 | K TCD D17-D19 CO | TCD-189-P-CO+ | SPGX 07...DW |
| 3300-C32-TP | 33 | 12.8 | 29.8 | 3.97 | 15.9 | K TCD D15-D16 CO | TCD-159-P-CO+ | SPGX 09...DW |
| 3400-C34-TP | 34 | 13.6 | 31.6 | 4.14 | 16.9 | K TCD D15-D16 CO | TCD-169-P-CO+ | SPGX 09...DW |
| 3500-C34-TP | 35 | 13.6 | 31.8 | 4.30 | 17.9 | K TCD D17-D19 CO | TCD-179-P-CO+ | SPGX 09...DW |
| 3600-C36-TP | 36 | 14.4 | 33.5 | 4.46 | 18.9 | K TCD D17-D19 CO | TCD-189-P-CO+ | SPGX 09...DW |
| 3700-C36-TP | 37 | 14.4 | 33.3 | 4.14 | 16.9 | K TCD D15-D16 CO | TCD-169-P-CO+ | SPGX 11...DW |
| 3800-C38-TP | 38 | 15.2 | 35.0 | 4.30 | 17.9 | K TCD D17-D19 CO | TCD-179-P-CO+ | SPGX 11...DW |
| 3900-C38-TP | 39 | 15.2 | 35.2 | 4.46 | 18.9 | K TCD D17-D19 CO | TCD-189-P-CO+ | SPGX 11...DW |
| 4000-C40-TP | 40 | 16.0 | 36.9 | 4.62 | 19.9 | K TCD D17-D19 CO | TCD-199-P-CO+ | SPGX 11...DW |
| 4100-C40-TP | 41 | 16.0 | 37.1 | 4.78 | 20.9 | K TCD D20-D21 CO | TCD-209-P-CO+ | SPGX 11...DW |
| 4200-C42-TP | 42 | 16.8 | 38.9 | 4.95 | 21.9 | K TCD D20-D21 CO | TCD-219-P-CO+ | SPGX 11...DW |
| 4300-C42-TP | 43 | 16.8 | 38.9 | 5.11 | 22.9 | K TCD D22-D23 CO | TCD-229-P-CO+ | SPGX 11...DW |



- DCONMS: Holder connection size
- Guide pad is sold separately from drill head

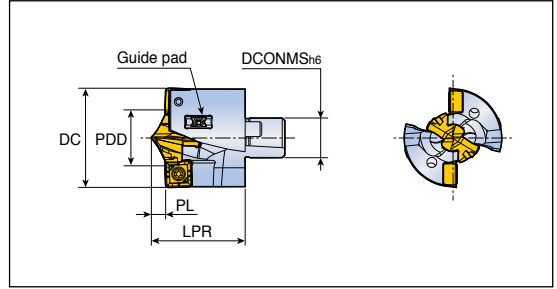
Spare parts

| Designation | For double pitch screw | | For SPGX | | For Guide pad | |
|-----------------------|------------------------|---------|--------------|---------|----------------|---------|
| | Screw1 | Wrench1 | Screw2 | Wrench2 | Screw3 | Wrench3 |
| TNDH 2600-2800 | TDPS 0512-T7 | TD 7 | TS 220521/HG | TD 7 | TS 200431/HG-P | TD 6P |
| TNDH 2900-3200 | TDPS 0512-T7 | TD 7 | TS 250641 | TD 8 | TS 200431/HG-P | TD 6P |
| TNDH 3300-3500 | TDPS 0512-T7 | TD 7 | TS 350881 | TD 10 | TS 200431/HG-P | TD 6P |
| TNDH 3600 | TDPS 0618-T8 | TD 8 | TS 350881 | TD 10 | TS 200431/HG-P | TD 6P |
| TNDH 3700-4300 | TDPS 0618-T8 | TD 8 | TS 400931 | TD 15 | TS 200431/HG-P | TD 6P |



TNDH-TP

Modular drill heads

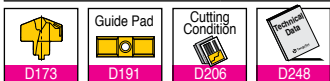


| Designation | Dimension (mm) | | | | | Clamping Key | Insert | |
|-------------------------|----------------|--------|------|------|------|------------------|---------------|--------------|
| | DC | DCONMS | LPR | PL | PDD | | Center | Outer |
| TNDH 4400-C44-TP | 44 | 17.6 | 40.8 | 5.28 | 23.9 | K TCD D22-D23 CO | TCD-239-P-CO+ | SPGX 11...DW |
| 4500-C44-TP | 45 | 17.6 | 41.0 | 5.44 | 24.9 | K TCD D24-D25 CO | TCD-249-P-CO+ | SPGX 11...DW |
| 4600-C46-TP | 46 | 18.4 | 42.2 | 4.95 | 21.9 | K TCD D20-D21 CO | TCD-219-P-CO+ | SPGX 14...DW |
| 4700-C46-TP | 47 | 18.4 | 42.3 | 5.11 | 22.9 | K TCD D22-D23 CO | TCD-229-P-CO+ | SPGX 14...DW |
| 4800-C48-TP | 48 | 19.2 | 44.0 | 5.28 | 23.9 | K TCD D22-D23 CO | TCD-239-P-CO+ | SPGX 14...DW |
| 4900-C48-TP | 49 | 19.2 | 44.3 | 5.44 | 24.9 | K TCD D24-D25 CO | TCD-249-P-CO+ | SPGX 14...DW |
| 5000-C48-TP | 50 | 19.2 | 46.0 | 5.61 | 25.9 | K TCD D24-D25 CO | TCD-259-P-CO+ | SPGX 14...DW |
| | | | | | | | | D173 |
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- DCONMS: Holder connection size
- Guide pad is sold separately from drill head

Spare parts

| Designation | For double pitch screw | | For SPGX | | For Guide pad | |
|-----------------------|------------------------|---------|-----------|---------|----------------|---------|
| | Screw1 | Wrench1 | Screw2 | Wrench2 | Screw3 | Wrench3 |
| TNDH 4400-4500 | TDPS 0722-W3.0 | F-W3.0 | TS 40093I | TD 15 | TS 20043I/HG-P | TD 6P |
| TNDH 4600-5000 | TDPS 0722-W3.0 | F-W3.0 | SO 50090I | TD 20 | TS 20043I/HG-P | TD 6P |
| | | | | | | |
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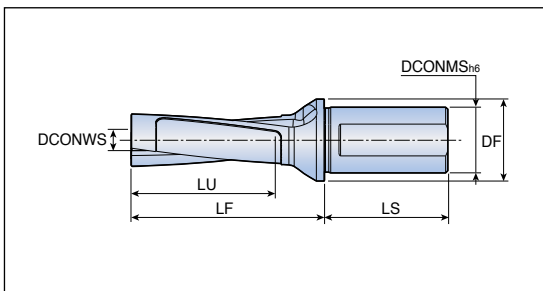


MDB...T2-3

Modular drill holders - Weldon type shank



- Drilling depth: 3x diameter



| Designation | Dimension (mm) | | | | | | |
|----------------------------------|----------------|--------|--------|----|-----|-------|----|
| | DC | DCONWS | DCONMS | DF | LU | LF | LS |
| MDB D26/27-081-32T2-C26-3 | 26-27 | 10.4 | 32 | 40 | 60 | 94.3 | 60 |
| D28/29-087-32T2-C28-3 | 28-29 | 11.2 | 32 | 40 | 64 | 100.5 | 60 |
| D30/31-093-32T2-C30-3 | 30-31 | 12.0 | 32 | 40 | 69 | 105.5 | 60 |
| D32/33-099-32T2-C32-3 | 32-33 | 12.8 | 32 | 40 | 73 | 111.7 | 60 |
| D34/35-105-40T2-C34-3 | 34-35 | 13.6 | 40 | 50 | 78 | 120.2 | 68 |
| D36/37-111-40T2-C36-3 | 36-37 | 14.4 | 40 | 50 | 82 | 126.5 | 68 |
| D38/39-117-40T2-C38-3 | 38-39 | 15.2 | 40 | 50 | 86 | 131.4 | 68 |
| D40/41-123-40T2-C40-3 | 40-41 | 16.0 | 40 | 50 | 91 | 137.6 | 68 |
| D42/43-129-40T2-C42-3 | 42-43 | 16.8 | 40 | 50 | 95 | 143.8 | 68 |
| D44/45-135-40T2-C44-3 | 44-45 | 17.6 | 40 | 50 | 99 | 150.0 | 68 |
| D46/47-141-50T2-C46-3 | 46-47 | 18.4 | 50 | 60 | 104 | 154.5 | 80 |
| D48/50-150-50T2-C48-3 | 48-50 | 19.2 | 50 | 60 | 111 | 160.9 | 80 |
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| | | | | | | | |

- DC : Cutting diameter range
- DCONWS : Modular head connection size

Spare parts

| Designation | Wrench | Wrench handle | | |
|----------------------------|----------------|---------------|--|--|
| | | | | |
| MDB D26/27-D34/35-3 | BLD H-W2.5x210 | SW6-T-SH | | |
| MDB D36/37-D42/43-3 | BLD H-W3.0x225 | SW6-T-SH | | |
| MDB D44/45-D48/50-3 | BLD H-W4.0x255 | SW6-T-SH | | |
| | | | | |
| | | | | |

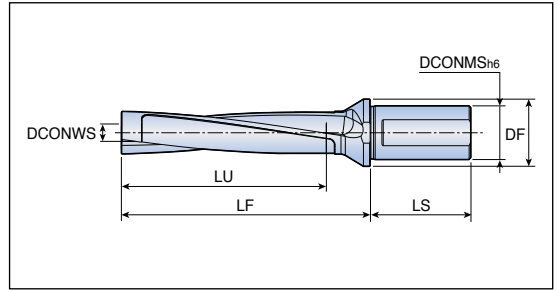
- Wrench: Disassemble the modular head from the modular body (Insert from the rear shank)



Modular drill holders - Weldon type shank



- Drilling depth: 5xdiameter



| Designation | Dimension (mm) | | | | | | |
|----------------------------------|----------------|--------|--------|----|-----|-------|----|
| | DC | DCONWS | DCONMS | DF | LU | LF | LS |
| MDB D26/27-135-32T2-C26-5 | 26-27 | 10.4 | 32 | 40 | 114 | 148.3 | 60 |
| D28/29-145-32T2-C28-5 | 28-29 | 11.2 | 32 | 40 | 122 | 158.5 | 60 |
| D30/31-155-32T2-C30-5 | 30-31 | 12.0 | 32 | 40 | 131 | 167.5 | 60 |
| D32/33-165-32T2-C32-5 | 32-33 | 12.8 | 32 | 40 | 139 | 177.7 | 60 |
| D34/35-175-40T2-C34-5 | 34-35 | 13.6 | 40 | 50 | 148 | 190.2 | 68 |
| D36/37-185-40T2-C36-5 | 36-37 | 14.4 | 40 | 50 | 156 | 200.5 | 68 |
| D38/39-195-40T2-C38-5 | 38-39 | 15.2 | 40 | 50 | 164 | 209.4 | 68 |
| D40/41-205-40T2-C40-5 | 40-41 | 16.0 | 40 | 50 | 173 | 219.6 | 68 |
| D42/43-215-40T2-C42-5 | 42-43 | 16.8 | 40 | 50 | 181 | 229.8 | 68 |
| D44/45-225-40T2-C44-5 | 44-45 | 17.6 | 40 | 50 | 189 | 240.0 | 68 |
| D46/47-235-50T2-C46-5 | 46-47 | 18.4 | 50 | 60 | 198 | 248.5 | 80 |
| D48/50-250-50T2-C48-5 | 48-50 | 19.2 | 50 | 60 | 211 | 258.9 | 80 |
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| | | | | | | | |

- DC : Cutting diameter range
- DCONWS : Modular head connection size

Spare parts

| Designation | Wrench | Wrench handle | | |
|----------------------------|----------------|---------------|--|--|
| | | | | |
| MDB D26/27-D34/35-5 | BLD H-W2.5x280 | SW6-T-SH | | |
| MDB D36/37-D42/43-5 | BLD H-W3.0x310 | SW6-T-SH | | |
| MDB D44/45-D48/50-5 | BLD H-W4.0x350 | SW6-T-SH | | |
| | | | | |
| | | | | |

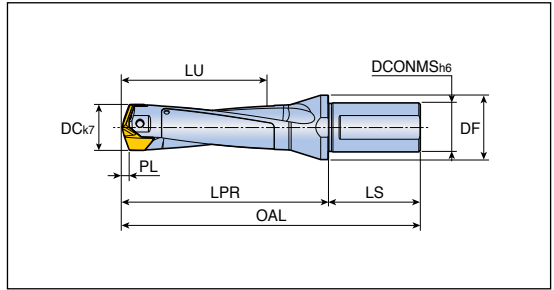
- Wrench: Disassemble the modular head from the modular body (Insert from the rear shank)



Head changeable drill holders - Weldon type shank



- Drilling depth: 3x diameter

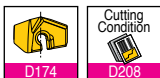


| Designation | Dimension (mm) | | | | | | | |
|----------------------------|----------------|--------|----|-----|-------|----|------|-----|
| | DC | DCONMS | DF | LU | LPR | LS | PL | SSC |
| LCD 200-209-25T2-3D | 20.0-20.9 | 25 | 32 | 63 | 92.1 | 56 | 3.11 | 20 |
| 210-219-25T2-3D | 21.0-21.9 | 25 | 32 | 66 | 95.3 | 56 | 3.29 | 21 |
| 220-229-25T2-3D | 22.0-22.9 | 25 | 32 | 69 | 98.4 | 56 | 3.42 | 22 |
| 230-239-25T2-3D | 23.0-23.9 | 25 | 32 | 73 | 101.6 | 56 | 3.60 | 23 |
| 240-249-32T2-3D | 24.0-24.9 | 32 | 40 | 76 | 110.7 | 60 | 3.73 | 24 |
| 250-259-32T2-3D | 25.0-25.9 | 32 | 40 | 79 | 113.9 | 60 | 3.91 | 25 |
| 260-269-32T2-3D | 26.0-26.9 | 32 | 40 | 82 | 117.0 | 60 | 4.04 | 26 |
| 270-279-32T2-3D | 27.0-27.9 | 32 | 40 | 85 | 120.2 | 60 | 4.22 | 27 |
| 280-289-32T2-3D | 28.0-28.9 | 32 | 40 | 88 | 128.4 | 60 | 4.35 | 28 |
| 290-299-32T2-3D | 29.0-29.9 | 32 | 40 | 92 | 131.5 | 60 | 4.53 | 29 |
| 300-309-32T2-3D | 30.0-30.9 | 32 | 42 | 95 | 134.7 | 60 | 4.67 | 30 |
| 310-319-32T2-3D | 31.0-31.9 | 32 | 42 | 98 | 137.9 | 60 | 4.85 | 31 |
| 320-329-40T2-3D | 32.0-32.9 | 40 | 48 | 101 | 143.0 | 68 | 4.98 | 32 |
| 330-339-40T2-3D | 33.0-33.9 | 40 | 48 | 104 | 146.2 | 68 | 5.16 | 33 |
| 340-349-40T2-3D | 34.0-34.9 | 40 | 48 | 107 | 149.3 | 68 | 5.34 | 34 |
| 350-359-40T2-3D | 35.0-35.9 | 40 | 48 | 110 | 152.4 | 68 | 5.44 | 35 |
| 360-369-40T2-3D | 36.0-36.9 | 40 | 48 | 114 | 155.6 | 68 | 5.62 | 36 |
| 370-379-40T2-3D | 37.0-37.9 | 40 | 48 | 117 | 158.8 | 68 | 5.80 | 37 |
| 380-389-40T2-3D | 38.0-38.9 | 40 | 50 | 120 | 166.9 | 68 | 5.91 | 38 |
| 390-399-40T2-3D | 39.0-39.9 | 40 | 50 | 123 | 170.1 | 68 | 6.09 | 39 |
| 400-410-40T2-3D | 40.0-41.0 | 40 | 50 | 126 | 173.3 | 68 | 6.27 | 40 |

- OAL = LPR+LS
- SSC: Seat size code

Spare parts

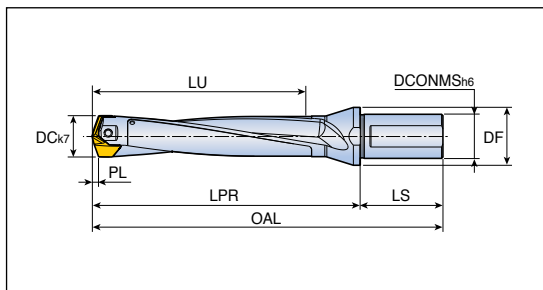
| Designation | Screw | Wrench | Wrench handle | |
|-----------------------|-------------|------------|---------------|--|
| | | | | |
| LCD 200-219-3D | TS 40178D25 | BLD T20/S7 | SW6-T-SH | |
| LCD 220-239-3D | TS 40198D28 | BLD T20/S7 | SW6-T-SH | |
| LCD 240-259-3D | TS 40210D3 | BLD T20/S7 | SW6-T-SH | |
| LCD 260-279-3D | TS 50230D3 | BLD T20/S7 | SW6-T-SH | |
| LCD 280-299-3D | TS 50250D35 | BLD T25/S7 | SW6-T-SH | |
| LCD 300-319-3D | TS 60265D4 | BLD T25/S7 | SW6-T-SH | |
| LCD 320-349-3D | TS 60285D42 | BLD T25/S7 | SW6-T-SH | |
| LCD 350-379-3D | TS 60320D5 | BLD T25/S7 | SW6-T-SH | |
| LCD 380-410-3D | TS 80340D6 | BLD T25/S7 | SW6-T-SH | |



Head changeable drill holders - Weldon type shank



- Drilling depth: 5x diameter

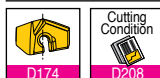


| Designation | Dimension (mm) | | | | | | | |
|----------------------------|----------------|--------|----|-----|-------|----|------|-----|
| | DC | DCONMS | DF | LU | LPR | LS | PL | SSC |
| LCD 200-209-25T2-5D | 20.0-20.9 | 25 | 32 | 103 | 132.1 | 56 | 3.11 | 20 |
| 210-219-25T2-5D | 21.0-21.9 | 25 | 32 | 108 | 137.3 | 56 | 3.29 | 21 |
| 220-229-25T2-5D | 22.0-22.9 | 25 | 32 | 113 | 142.4 | 56 | 3.42 | 22 |
| 230-239-25T2-5D | 23.0-23.9 | 25 | 32 | 119 | 147.6 | 56 | 3.60 | 23 |
| 240-249-32T2-5D | 24.0-24.9 | 32 | 40 | 124 | 158.7 | 60 | 3.73 | 24 |
| 250-259-32T2-5D | 25.0-25.9 | 32 | 40 | 129 | 163.9 | 60 | 3.91 | 25 |
| 260-269-32T2-5D | 26.0-26.9 | 32 | 40 | 134 | 169.0 | 60 | 4.04 | 26 |
| 270-279-32T2-5D | 27.0-27.9 | 32 | 40 | 139 | 174.2 | 60 | 4.22 | 27 |
| 280-289-32T2-5D | 28.0-28.9 | 32 | 40 | 144 | 184.4 | 60 | 4.35 | 28 |
| 290-299-32T2-5D | 29.0-29.9 | 32 | 40 | 150 | 189.5 | 60 | 4.53 | 29 |
| 300-309-32T2-5D | 30.0-30.9 | 32 | 42 | 155 | 194.7 | 60 | 4.67 | 30 |
| 310-319-32T2-5D | 31.0-31.9 | 32 | 42 | 160 | 199.9 | 60 | 4.85 | 31 |
| 320-329-40T2-5D | 32.0-32.9 | 40 | 48 | 165 | 207.0 | 68 | 4.98 | 32 |
| 330-339-40T2-5D | 33.0-33.9 | 40 | 48 | 170 | 212.2 | 68 | 5.16 | 33 |
| 340-349-40T2-5D | 34.0-34.9 | 40 | 48 | 175 | 217.3 | 68 | 5.34 | 34 |
| 350-359-40T2-5D | 35.0-35.9 | 40 | 48 | 180 | 222.4 | 68 | 5.44 | 35 |
| 360-369-40T2-5D | 36.0-36.9 | 40 | 48 | 186 | 227.6 | 68 | 5.62 | 36 |
| 370-379-40T2-5D | 37.0-37.9 | 40 | 48 | 191 | 232.8 | 68 | 5.80 | 37 |
| 380-389-40T2-5D | 38.0-38.9 | 40 | 50 | 196 | 242.9 | 68 | 5.91 | 38 |
| 390-399-40T2-5D | 39.0-39.9 | 40 | 50 | 201 | 248.1 | 68 | 6.09 | 39 |
| 400-410-40T2-5D | 40.0-41.0 | 40 | 50 | 206 | 253.3 | 68 | 6.27 | 40 |

- OAL = LPR+LS
- SSC: Seat size code

Spare parts

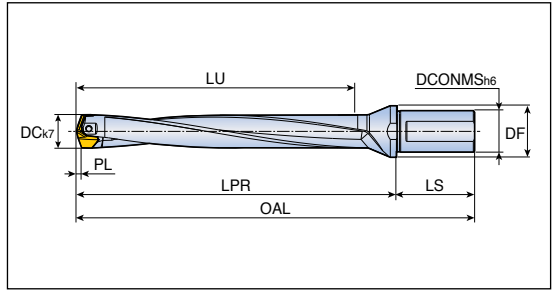
| Designation | Screw | Wrench | Wrench handle | |
|-----------------------|-------------|------------|---------------|--|
| | | | | |
| LCD 200-219-5D | TS 40178D25 | BLD T20/S7 | SW6-T-SH | |
| LCD 220-239-5D | TS 40198D28 | BLD T20/S7 | SW6-T-SH | |
| LCD 240-259-5D | TS 40210D3 | BLD T20/S7 | SW6-T-SH | |
| LCD 260-279-5D | TS 50230D3 | BLD T20/S7 | SW6-T-SH | |
| LCD 280-299-5D | TS 50250D35 | BLD T25/S7 | SW6-T-SH | |
| LCD 300-319-5D | TS 60265D4 | BLD T25/S7 | SW6-T-SH | |
| LCD 320-349-5D | TS 60285D42 | BLD T25/S7 | SW6-T-SH | |
| LCD 350-379-5D | TS 60320D5 | BLD T25/S7 | SW6-T-SH | |
| LCD 380-410-5D | TS 80340D6 | BLD T25/S7 | SW6-T-SH | |



Head changeable drill holders - Weldon type shank



- Drilling depth: 8x diameter



| Designation | Dimension (mm) | | | | | | | |
|----------------------------|----------------|--------|----|-------|-------|----|------|-----|
| | DC | DCONMS | DF | LU | LPR | LS | PL | SSC |
| LCD 200-209-25T2-8D | 20.0-20.9 | 25 | 32 | 163.1 | 192.1 | 56 | 3.11 | 20 |
| 210-219-25T2-8D | 21.0-21.9 | 25 | 32 | 171.3 | 200.1 | 56 | 3.29 | 21 |
| 220-229-25T2-8D | 22.0-22.9 | 25 | 32 | 179.4 | 208.4 | 56 | 3.42 | 22 |
| 230-239-25T2-8D | 23.0-23.9 | 25 | 32 | 187.6 | 216.4 | 56 | 3.60 | 23 |
| 240-249-32T2-8D | 24.0-24.9 | 32 | 40 | 195.7 | 230.7 | 60 | 3.73 | 24 |
| 250-259-32T2-8D | 25.0-25.9 | 32 | 40 | 203.9 | 238.7 | 60 | 3.91 | 25 |
| 260-269-32T2-8D | 26.0-26.9 | 32 | 40 | 212.0 | 247.0 | 60 | 4.04 | 26 |
| 270-279-32T2-8D | 27.0-27.9 | 32 | 40 | 220.2 | 255.0 | 60 | 4.22 | 27 |
| 280-289-32T2-8D | 28.0-28.9 | 32 | 40 | 228.4 | 268.4 | 60 | 4.35 | 28 |
| 290-299-32T2-8D | 29.0-29.9 | 32 | 40 | 236.5 | 276.4 | 60 | 4.53 | 29 |
| 300-309-32T2-8D | 30.0-30.9 | 32 | 42 | 244.7 | 284.7 | 60 | 4.67 | 30 |
| 310-319-32T2-8D | 31.0-31.9 | 32 | 42 | 252.9 | 292.7 | 60 | 4.85 | 31 |
| 320-329-40T2-8D | 32.0-32.9 | 40 | 48 | 261.0 | 303.0 | 68 | 4.98 | 32 |
| 330-339-40T2-8D | 33.0-33.9 | 40 | 48 | 269.2 | 311.0 | 68 | 5.16 | 33 |
| 340-349-40T2-8D | 34.0-34.9 | 40 | 48 | 277.3 | 319.0 | 68 | 5.34 | 34 |
| 350-359-40T2-8D | 35.0-35.9 | 40 | 48 | 285.4 | 327.4 | 68 | 5.44 | 35 |
| 360-369-40T2-8D | 36.0-36.9 | 40 | 48 | 293.6 | 335.4 | 68 | 5.62 | 36 |
| 370-379-40T2-8D | 37.0-37.9 | 40 | 48 | 301.8 | 343.4 | 68 | 5.80 | 37 |
| 380-389-40T2-8D | 38.0-38.9 | 40 | 50 | 309.9 | 356.9 | 68 | 5.91 | 38 |
| 390-399-40T2-8D | 39.0-39.9 | 40 | 50 | 318.1 | 364.9 | 68 | 6.09 | 39 |
| 400-410-40T2-8D | 40.0-41.0 | 40 | 50 | 326.3 | 372.9 | 68 | 6.27 | 40 |

- OAL = LPR + LS
- SSC: Seat size code
- It is recommended to make the pilot hole with a 3D holder

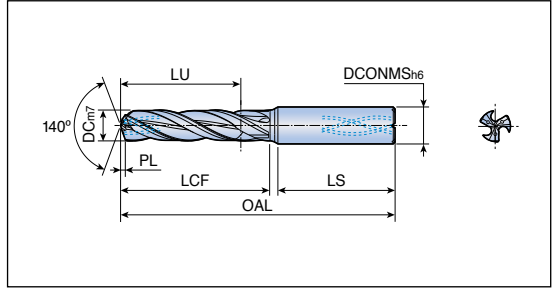
Spare parts

| Designation | Screw | Wrench | Wrench handle | |
|-----------------------|-------------|------------|---------------|--|
| LCD 200-219-8D | TS 40178D25 | BLD T20/S7 | SW6-T-SH | |
| LCD 220-239-8D | TS 40198D28 | BLD T20/S7 | SW6-T-SH | |
| LCD 240-259-8D | TS 40210D3 | BLD T20/S7 | SW6-T-SH | |
| LCD 260-279-8D | TS 50230D3 | BLD T20/S7 | SW6-T-SH | |
| LCD 280-299-8D | TS 50250D35 | BLD T25/S7 | SW6-T-SH | |
| LCD 300-319-8D | TS 60265D4 | BLD T25/S7 | SW6-T-SH | |
| LCD 320-349-8D | TS 60285D42 | BLD T25/S7 | SW6-T-SH | |
| LCD 350-379-8D | TS 60320D5 | BLD T25/S7 | SW6-T-SH | |
| LCD 380-410-8D | TS 80340D6 | BLD T25/S7 | SW6-T-SH | |



3HD...PI3

3 flute solid carbide drills with oil holes



- Drilling depth: 3xdiameter



| Designation | Dimension (mm) | | | | | | | Grade TT5130 |
|--------------------|----------------|--------|-----|----|-----|----|------|-----------------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | |
| 3HD 040-017-06 PI3 | 4.0 | 6.0 | 66 | 17 | 25 | 35 | 0.82 | • |
| 045-017-06 PI3 | 4.5 | 6.0 | 66 | 17 | 25 | 35 | 0.88 | • |
| 050-020-06 PI3 | 5.0 | 6.0 | 66 | 20 | 29 | 36 | 0.96 | • |
| 051-020-06 PI3 | 5.1 | 6.0 | 66 | 20 | 29 | 36 | 0.98 | • |
| 055-020-06 PI3 | 5.5 | 6.0 | 66 | 20 | 29 | 36 | 1.08 | • |
| 060-020-06 PI3 | 6.0 | 6.0 | 66 | 20 | 29 | 36 | 1.17 | • |
| 065-024-08 PI3 | 6.5 | 8.0 | 79 | 24 | 35 | 36 | 1.26 | • |
| 068-024-08 PI3 | 6.8 | 8.0 | 79 | 24 | 35 | 36 | 1.31 | • |
| 070-024-08 PI3 | 7.0 | 8.0 | 79 | 24 | 35 | 36 | 1.35 | • |
| 075-029-08 PI3 | 7.5 | 8.0 | 79 | 29 | 42 | 36 | 1.40 | • |
| 080-029-08 PI3 | 8.0 | 8.0 | 79 | 29 | 42 | 36 | 1.49 | • |
| 085-035-10 PI3 | 8.5 | 10.0 | 89 | 35 | 48 | 40 | 1.63 | • |
| 086-035-10 PI3 | 8.6 | 10.0 | 89 | 35 | 48 | 40 | 1.65 | • |
| 090-035-10 PI3 | 9.0 | 10.0 | 89 | 35 | 48 | 40 | 1.72 | • |
| 095-035-10 PI3 | 9.5 | 10.0 | 89 | 35 | 48 | 40 | 1.75 | • |
| 100-035-10 PI3 | 10.0 | 10.0 | 89 | 35 | 48 | 40 | 1.85 | • |
| 103-040-12 PI3 | 10.3 | 12.0 | 102 | 40 | 55 | 45 | 1.94 | • |
| 105-040-12 PI3 | 10.5 | 12.0 | 102 | 40 | 55 | 45 | 1.98 | • |
| 110-040-12 PI3 | 11.0 | 12.0 | 102 | 40 | 55 | 45 | 2.07 | • |
| 115-040-12 PI3 | 11.5 | 12.0 | 102 | 40 | 56 | 45 | 2.12 | • |
| 120-040-12 PI3 | 12.0 | 12.0 | 102 | 40 | 56 | 45 | 2.21 | • |
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• Standard items

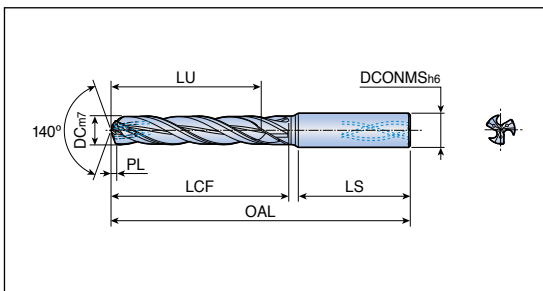
3HD...PI5



3 flute solid carbide drills with oil holes



- Drilling depth: 5xdiameter



| Designation | Dimension (mm) | | | | | | | Grade TT5130 |
|---------------------------|----------------|--------|-----|----|-----|----|------|-----------------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | |
| 3HD 040-029-06 PI5 | 4.0 | 6.0 | 74 | 29 | 37 | 35 | 0.82 | ● |
| 045-029-06 PI5 | 4.5 | 6.0 | 74 | 29 | 37 | 35 | 0.88 | ● |
| 050-035-06 PI5 | 5.0 | 6.0 | 82 | 35 | 45 | 36 | 0.96 | ● |
| 051-035-06 PI5 | 5.1 | 6.0 | 82 | 35 | 45 | 36 | 0.98 | ● |
| 055-035-06 PI5 | 5.5 | 6.0 | 82 | 35 | 45 | 36 | 1.08 | ● |
| 060-035-06 PI5 | 6.0 | 6.0 | 82 | 35 | 45 | 36 | 1.17 | ● |
| 065-043-08 PI5 | 6.5 | 8.0 | 91 | 43 | 54 | 36 | 1.26 | ● |
| 068-043-08 PI5 | 6.8 | 8.0 | 91 | 43 | 54 | 36 | 1.31 | ● |
| 070-043-08 PI5 | 7.0 | 8.0 | 91 | 43 | 54 | 36 | 1.35 | ● |
| 075-043-08 PI5 | 7.5 | 8.0 | 91 | 43 | 54 | 36 | 1.40 | ● |
| 080-043-08 PI5 | 8.0 | 8.0 | 91 | 43 | 54 | 36 | 1.49 | ● |
| 085-049-10 PI5 | 8.5 | 10.0 | 103 | 49 | 62 | 40 | 1.63 | ● |
| 086-049-10 PI5 | 8.6 | 10.0 | 103 | 49 | 62 | 40 | 1.65 | ● |
| 090-049-10 PI5 | 9.0 | 10.0 | 103 | 49 | 62 | 40 | 1.72 | ● |
| 095-049-10 PI5 | 9.5 | 10.0 | 103 | 49 | 62 | 40 | 1.75 | ● |
| 100-049-10 PI5 | 10.0 | 10.0 | 103 | 49 | 62 | 40 | 1.85 | ● |
| 103-056-12 PI5 | 10.3 | 12.0 | 118 | 56 | 71 | 45 | 1.94 | ● |
| 105-056-12 PI5 | 10.5 | 12.0 | 118 | 56 | 71 | 45 | 1.98 | ● |
| 110-056-12 PI5 | 11.0 | 12.0 | 118 | 56 | 71 | 45 | 2.07 | ● |
| 115-056-12 PI5 | 11.5 | 12.0 | 118 | 56 | 72 | 45 | 2.12 | ● |
| 120-056-12 PI5 | 12.0 | 12.0 | 118 | 56 | 72 | 45 | 2.21 | ● |
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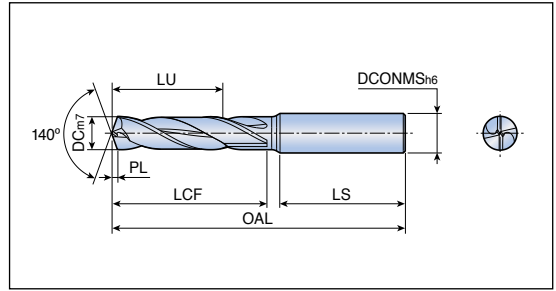


●: Standard items

Solid carbide drills without oil holes



- Drilling depth: 3xdiameter



| Designation | Dimension (mm) | | | | | | | Grade |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | TT9030 |
| NHD 030-014-06 PE3 | 3.0 | 6.0 | 62 | 14 | 21 | 34 | 0.5 | ● |
| 031-014-06 PE3 | 3.1 | 6.0 | 62 | 14 | 21 | 34 | 0.5 | ● |
| 032-014-06 PE3 | 3.2 | 6.0 | 62 | 14 | 21 | 34 | 0.5 | ● |
| 033-014-06 PE3 | 3.3 | 6.0 | 62 | 14 | 21 | 34 | 0.5 | ● |
| 034-014-06 PE3 | 3.4 | 6.0 | 62 | 14 | 21 | 34 | 0.5 | ● |
| 035-014-06 PE3 | 3.5 | 6.0 | 62 | 14 | 21 | 34 | 0.6 | ● |
| 036-014-06 PE3 | 3.6 | 6.0 | 62 | 14 | 21 | 34 | 0.6 | ● |
| 037-014-06 PE3 | 3.7 | 6.0 | 62 | 14 | 21 | 34 | 0.6 | ● |
| 038-017-06 PE3 | 3.8 | 6.0 | 66 | 17 | 25 | 35 | 0.6 | ● |
| 039-017-06 PE3 | 3.9 | 6.0 | 66 | 17 | 25 | 35 | 0.6 | ● |
| 040-017-06 PE3 | 4.0 | 6.0 | 66 | 17 | 25 | 35 | 0.6 | ● |
| 041-017-06 PE3 | 4.1 | 6.0 | 66 | 17 | 25 | 35 | 0.7 | ● |
| 042-017-06 PE3 | 4.2 | 6.0 | 66 | 17 | 25 | 35 | 0.7 | ● |
| 043-017-06 PE3 | 4.3 | 6.0 | 66 | 17 | 25 | 35 | 0.7 | ● |
| 044-017-06 PE3 | 4.4 | 6.0 | 66 | 17 | 25 | 35 | 0.7 | ● |
| 045-017-06 PE3 | 4.5 | 6.0 | 66 | 17 | 25 | 35 | 0.7 | ● |
| 046-017-06 PE3 | 4.6 | 6.0 | 66 | 17 | 25 | 35 | 0.7 | ● |
| 047-017-06 PE3 | 4.7 | 6.0 | 66 | 17 | 25 | 35 | 0.8 | ● |
| 048-020-06 PE3 | 4.8 | 6.0 | 66 | 20 | 29 | 36 | 0.8 | ● |
| 049-020-06 PE3 | 4.9 | 6.0 | 66 | 20 | 29 | 36 | 0.8 | ● |
| 050-020-06 PE3 | 5.0 | 6.0 | 66 | 20 | 29 | 36 | 0.8 | ● |
| 051-020-06 PE3 | 5.1 | 6.0 | 66 | 20 | 29 | 36 | 0.8 | ● |
| 052-020-06 PE3 | 5.2 | 6.0 | 66 | 20 | 29 | 36 | 0.8 | ● |
| 053-020-06 PE3 | 5.3 | 6.0 | 66 | 20 | 29 | 36 | 0.8 | ● |
| 054-020-06 PE3 | 5.4 | 6.0 | 66 | 20 | 29 | 36 | 0.8 | ● |
| 055-020-06 PE3 | 5.5 | 6.0 | 66 | 20 | 29 | 36 | 0.9 | ● |
| 056-020-06 PE3 | 5.6 | 6.0 | 66 | 20 | 29 | 36 | 0.9 | ● |
| 057-020-06 PE3 | 5.7 | 6.0 | 66 | 20 | 29 | 36 | 0.9 | ● |
| 058-020-06 PE3 | 5.8 | 6.0 | 66 | 20 | 29 | 36 | 0.9 | ● |
| 059-020-06 PE3 | 5.9 | 6.0 | 66 | 20 | 29 | 36 | 0.9 | ● |
| 060-020-06 PE3 | 6.0 | 6.0 | 66 | 20 | 29 | 36 | 0.9 | ● |
| 061-024-08 PE3 | 6.1 | 8.0 | 79 | 24 | 35 | 36 | 1.0 | ● |
| 062-024-08 PE3 | 6.2 | 8.0 | 79 | 24 | 35 | 36 | 1.0 | ● |
| 063-024-08 PE3 | 6.3 | 8.0 | 79 | 24 | 35 | 36 | 1.0 | ● |
| 064-024-08 PE3 | 6.4 | 8.0 | 79 | 24 | 35 | 36 | 1.0 | ● |

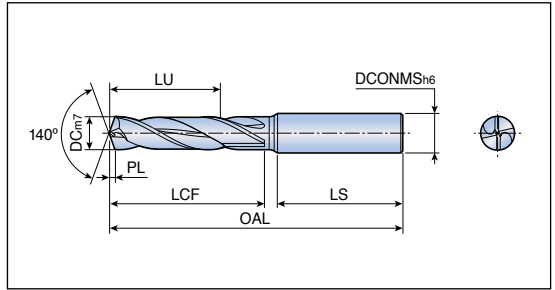
●: Standard items



Solid carbide drills without oil holes



• Drilling depth: 3xdiameter



| Designation | Dimension (mm) | | | | | | | Grade |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | TT9030 |
| NHD 065-024-08 PE3 | 6.5 | 8.0 | 79 | 24 | 35 | 36 | 1.0 | ● |
| 066-024-08 PE3 | 6.6 | 8.0 | 79 | 24 | 35 | 36 | 1.0 | ● |
| 067-024-08 PE3 | 6.7 | 8.0 | 79 | 24 | 35 | 36 | 1.1 | ● |
| 068-024-08 PE3 | 6.8 | 8.0 | 79 | 24 | 35 | 36 | 1.1 | ● |
| 069-024-08 PE3 | 6.9 | 8.0 | 79 | 24 | 35 | 36 | 1.1 | ● |
| 070-024-08 PE3 | 7.0 | 8.0 | 79 | 24 | 35 | 36 | 1.1 | ● |
| 071-029-08 PE3 | 7.1 | 8.0 | 79 | 29 | 42 | 36 | 1.1 | ● |
| 072-029-08 PE3 | 7.2 | 8.0 | 79 | 29 | 42 | 36 | 1.1 | ● |
| 073-029-08 PE3 | 7.3 | 8.0 | 79 | 29 | 42 | 36 | 1.1 | ● |
| 074-029-08 PE3 | 7.4 | 8.0 | 79 | 29 | 42 | 36 | 1.2 | ● |
| 075-029-08 PE3 | 7.5 | 8.0 | 79 | 29 | 42 | 36 | 1.2 | ● |
| 076-029-08 PE3 | 7.6 | 8.0 | 79 | 29 | 42 | 36 | 1.2 | ● |
| 077-029-08 PE3 | 7.7 | 8.0 | 79 | 29 | 42 | 36 | 1.2 | ● |
| 078-029-08 PE3 | 7.8 | 8.0 | 79 | 29 | 42 | 36 | 1.2 | ● |
| 079-029-08 PE3 | 7.9 | 8.0 | 79 | 29 | 42 | 36 | 1.3 | ● |
| 080-029-08 PE3 | 8.0 | 8.0 | 79 | 29 | 42 | 36 | 1.3 | ● |
| 081-035-10 PE3 | 8.1 | 10.0 | 89 | 35 | 48 | 40 | 1.3 | ● |
| 082-035-10 PE3 | 8.2 | 10.0 | 89 | 35 | 48 | 40 | 1.3 | ● |
| 083-035-10 PE3 | 8.3 | 10.0 | 89 | 35 | 48 | 40 | 1.3 | ● |
| 084-035-10 PE3 | 8.4 | 10.0 | 89 | 35 | 48 | 40 | 1.3 | ● |
| 085-035-10 PE3 | 8.5 | 10.0 | 89 | 35 | 48 | 40 | 1.3 | ● |
| 086-035-10 PE3 | 8.6 | 10.0 | 89 | 35 | 48 | 40 | 1.4 | ● |
| 087-035-10 PE3 | 8.7 | 10.0 | 89 | 35 | 48 | 40 | 1.4 | ● |
| 088-035-10 PE3 | 8.8 | 10.0 | 89 | 35 | 48 | 40 | 1.4 | ● |
| 089-035-10 PE3 | 8.9 | 10.0 | 89 | 35 | 48 | 40 | 1.4 | ● |
| 090-035-10 PE3 | 9.0 | 10.0 | 89 | 35 | 48 | 40 | 1.4 | ● |
| 091-035-10 PE3 | 9.1 | 10.0 | 89 | 35 | 48 | 40 | 1.4 | ● |
| 092-035-10 PE3 | 9.2 | 10.0 | 89 | 35 | 48 | 40 | 1.4 | ● |
| 093-035-10 PE3 | 9.3 | 10.0 | 89 | 35 | 48 | 40 | 1.5 | ● |
| 094-035-10 PE3 | 9.4 | 10.0 | 89 | 35 | 48 | 40 | 1.5 | ● |
| 095-035-10 PE3 | 9.5 | 10.0 | 89 | 35 | 48 | 40 | 1.5 | ● |
| 096-035-10 PE3 | 9.6 | 10.0 | 89 | 35 | 48 | 40 | 1.5 | ● |
| 097-035-10 PE3 | 9.7 | 10.0 | 89 | 35 | 48 | 40 | 1.5 | ● |
| 098-035-10 PE3 | 9.8 | 10.0 | 89 | 35 | 48 | 40 | 1.6 | ● |
| 099-035-10 PE3 | 9.9 | 10.0 | 89 | 35 | 48 | 40 | 1.6 | ● |

●: Standard items



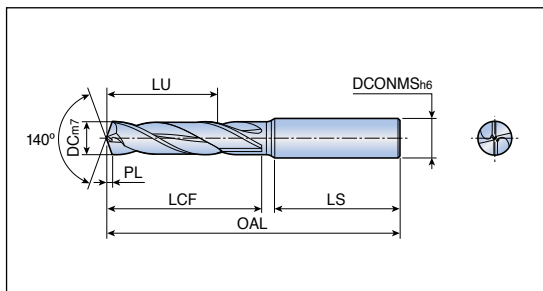
NHD...PE3



Solid carbide drills without oil holes



- Drilling depth: 3x diameter



| Designation | Dimension (mm) | | | | | | | Grade |
|---------------------------|----------------|--------|-----|----|-----|----|-----|-------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | |
| NHD 100-035-10 PE3 | 10.0 | 10.0 | 89 | 35 | 48 | 40 | 1.6 | ● |
| 101-040-12 PE3 | 10.1 | 12.0 | 101 | 40 | 54 | 45 | 1.6 | ● |
| 102-040-12 PE3 | 10.2 | 12.0 | 101 | 40 | 54 | 45 | 1.6 | ● |
| 103-040-12 PE3 | 10.3 | 12.0 | 101 | 40 | 54 | 45 | 1.6 | ● |
| 104-040-12 PE3 | 10.4 | 12.0 | 101 | 40 | 54 | 45 | 1.6 | ● |
| 105-040-12 PE3 | 10.5 | 12.0 | 101 | 40 | 54 | 45 | 1.6 | ● |
| 106-040-12 PE3 | 10.6 | 12.0 | 101 | 40 | 54 | 45 | 1.7 | ● |
| 107-040-12 PE3 | 10.7 | 12.0 | 101 | 40 | 54 | 45 | 1.7 | ● |
| 108-040-12 PE3 | 10.8 | 12.0 | 101 | 40 | 54 | 45 | 1.7 | ● |
| 109-040-12 PE3 | 10.9 | 12.0 | 101 | 40 | 54 | 45 | 1.7 | ● |
| 110-040-12 PE3 | 11.0 | 12.0 | 101 | 40 | 54 | 45 | 1.7 | ● |
| 111-040-12 PE3 | 11.1 | 12.0 | 101 | 40 | 55 | 45 | 1.7 | ● |
| 112-040-12 PE3 | 11.2 | 12.0 | 101 | 40 | 55 | 45 | 1.8 | ● |
| 113-040-12 PE3 | 11.3 | 12.0 | 101 | 40 | 55 | 45 | 1.8 | ● |
| 114-040-12 PE3 | 11.4 | 12.0 | 101 | 40 | 55 | 45 | 1.8 | ● |
| 115-040-12 PE3 | 11.5 | 12.0 | 101 | 40 | 55 | 45 | 1.8 | ● |
| 116-040-12 PE3 | 11.6 | 12.0 | 101 | 40 | 55 | 45 | 1.8 | ● |
| 117-040-12 PE3 | 11.7 | 12.0 | 101 | 40 | 55 | 45 | 1.9 | ● |
| 118-040-12 PE3 | 11.8 | 12.0 | 101 | 40 | 55 | 45 | 1.9 | ● |
| 119-040-12 PE3 | 11.9 | 12.0 | 101 | 40 | 55 | 45 | 1.9 | ● |
| 120-040-12 PE3 | 12.0 | 12.0 | 101 | 40 | 55 | 45 | 1.9 | ● |
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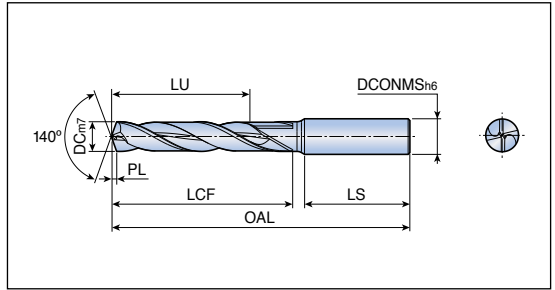
●: Standard items



Solid carbide drills without oil holes



• Drilling depth: 4-5x diameter



| Designation | Dimension (mm) | | | | | | | Grade |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | TT9030 |
| NHD 030-023-06 PE5 | 3.0 | 6.0 | 66 | 23 | 29 | 34 | 0.5 | ● |
| 031-023-06 PE5 | 3.1 | 6.0 | 66 | 23 | 29 | 34 | 0.5 | ● |
| 032-023-06 PE5 | 3.2 | 6.0 | 66 | 23 | 29 | 34 | 0.5 | ● |
| 033-023-06 PE5 | 3.3 | 6.0 | 66 | 23 | 29 | 34 | 0.5 | ● |
| 034-023-06 PE5 | 3.4 | 6.0 | 66 | 23 | 29 | 34 | 0.5 | ● |
| 035-023-06 PE5 | 3.5 | 6.0 | 66 | 23 | 29 | 34 | 0.6 | ● |
| 036-023-06 PE5 | 3.6 | 6.0 | 66 | 23 | 29 | 34 | 0.6 | ● |
| 037-023-06 PE5 | 3.7 | 6.0 | 66 | 23 | 29 | 34 | 0.6 | ● |
| 038-029-06 PE5 | 3.8 | 6.0 | 74 | 29 | 37 | 35 | 0.6 | ● |
| 039-029-06 PE5 | 3.9 | 6.0 | 74 | 29 | 37 | 35 | 0.6 | ● |
| 040-029-06 PE5 | 4.0 | 6.0 | 74 | 29 | 37 | 35 | 0.6 | ● |
| 041-029-06 PE5 | 4.1 | 6.0 | 74 | 29 | 37 | 35 | 0.7 | ● |
| 042-029-06 PE5 | 4.2 | 6.0 | 74 | 29 | 37 | 35 | 0.7 | ● |
| 043-029-06 PE5 | 4.3 | 6.0 | 74 | 29 | 37 | 35 | 0.7 | ● |
| 044-029-06 PE5 | 4.4 | 6.0 | 74 | 29 | 37 | 35 | 0.7 | ● |
| 045-029-06 PE5 | 4.5 | 6.0 | 74 | 29 | 37 | 35 | 0.7 | ● |
| 046-029-06 PE5 | 4.6 | 6.0 | 74 | 29 | 37 | 35 | 0.7 | ● |
| 047-029-06 PE5 | 4.7 | 6.0 | 74 | 29 | 37 | 35 | 0.8 | ● |
| 048-035-06 PE5 | 4.8 | 6.0 | 82 | 35 | 45 | 36 | 0.8 | ● |
| 049-035-06 PE5 | 4.9 | 6.0 | 82 | 35 | 45 | 36 | 0.8 | ● |
| 050-035-06 PE5 | 5.0 | 6.0 | 82 | 35 | 45 | 36 | 0.8 | ● |
| 051-035-06 PE5 | 5.1 | 6.0 | 82 | 35 | 45 | 36 | 0.8 | ● |
| 052-035-06 PE5 | 5.2 | 6.0 | 82 | 35 | 45 | 36 | 0.8 | ● |
| 053-035-06 PE5 | 5.3 | 6.0 | 82 | 35 | 45 | 36 | 0.8 | ● |
| 054-035-06 PE5 | 5.4 | 6.0 | 82 | 35 | 45 | 36 | 0.8 | ● |
| 055-035-06 PE5 | 5.5 | 6.0 | 82 | 35 | 45 | 36 | 0.9 | ● |
| 056-035-06 PE5 | 5.6 | 6.0 | 82 | 35 | 45 | 36 | 0.9 | ● |
| 057-035-06 PE5 | 5.7 | 6.0 | 82 | 35 | 45 | 36 | 0.9 | ● |
| 058-035-06 PE5 | 5.8 | 6.0 | 82 | 35 | 45 | 36 | 0.9 | ● |
| 059-035-06 PE5 | 5.9 | 6.0 | 82 | 35 | 45 | 36 | 0.9 | ● |
| 060-035-06 PE5 | 6.0 | 6.0 | 82 | 35 | 45 | 36 | 0.9 | ● |
| 061-043-08 PE5 | 6.1 | 8.0 | 91 | 43 | 54 | 36 | 1.0 | ● |
| 062-043-08 PE5 | 6.2 | 8.0 | 91 | 43 | 54 | 36 | 1.0 | ● |
| 063-043-08 PE5 | 6.3 | 8.0 | 91 | 43 | 54 | 36 | 1.0 | ● |
| 064-043-08 PE5 | 6.4 | 8.0 | 91 | 43 | 54 | 36 | 1.0 | ● |

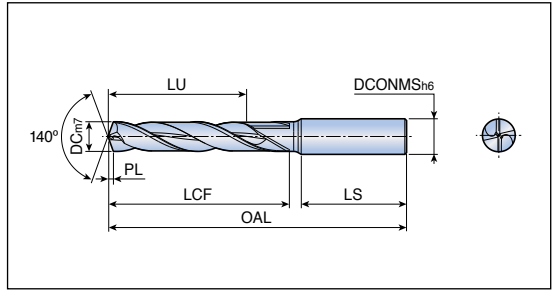
●: Standard items



NHD...PE5



Solid carbide drills without oil holes



• Drilling depth: 4-5xdiameter



| Designation | Dimension (mm) | | | | | | | Grade TT9030 |
|---------------------------|----------------|--------|-----|----|-----|----|-----|-----------------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | |
| NHD 065-043-08 PE5 | 6.5 | 8.0 | 91 | 43 | 54 | 36 | 1.0 | ● |
| 066-043-08 PE5 | 6.6 | 8.0 | 91 | 43 | 54 | 36 | 1.0 | ● |
| 067-043-08 PE5 | 6.7 | 8.0 | 91 | 43 | 54 | 36 | 1.1 | ● |
| 068-043-08 PE5 | 6.8 | 8.0 | 91 | 43 | 54 | 36 | 1.1 | ● |
| 069-043-08 PE5 | 6.9 | 8.0 | 91 | 43 | 54 | 36 | 1.1 | ● |
| 070-043-08 PE5 | 7.0 | 8.0 | 91 | 43 | 54 | 36 | 1.1 | ● |
| 071-043-08 PE5 | 7.1 | 8.0 | 91 | 43 | 54 | 36 | 1.1 | ● |
| 072-043-08 PE5 | 7.2 | 8.0 | 91 | 43 | 54 | 36 | 1.1 | ● |
| 073-043-08 PE5 | 7.3 | 8.0 | 91 | 43 | 54 | 36 | 1.1 | ● |
| 074-043-08 PE5 | 7.4 | 8.0 | 91 | 43 | 54 | 36 | 1.2 | ● |
| 075-043-08 PE5 | 7.5 | 8.0 | 91 | 43 | 54 | 36 | 1.2 | ● |
| 076-043-08 PE5 | 7.6 | 8.0 | 91 | 43 | 54 | 36 | 1.2 | ● |
| 077-043-08 PE5 | 7.7 | 8.0 | 91 | 43 | 54 | 36 | 1.2 | ● |
| 078-043-08 PE5 | 7.8 | 8.0 | 91 | 43 | 54 | 36 | 1.2 | ● |
| 079-043-08 PE5 | 7.9 | 8.0 | 91 | 43 | 54 | 36 | 1.3 | ● |
| 080-043-08 PE5 | 8.0 | 8.0 | 91 | 43 | 54 | 36 | 1.3 | ● |
| 081-049-10 PE5 | 8.1 | 10.0 | 103 | 49 | 62 | 40 | 1.3 | ● |
| 082-049-10 PE5 | 8.2 | 10.0 | 103 | 49 | 62 | 40 | 1.3 | ● |
| 083-049-10 PE5 | 8.3 | 10.0 | 103 | 49 | 62 | 40 | 1.3 | ● |
| 084-049-10 PE5 | 8.4 | 10.0 | 103 | 49 | 62 | 40 | 1.3 | ● |
| 085-049-10 PE5 | 8.5 | 10.0 | 103 | 49 | 62 | 40 | 1.3 | ● |
| 086-049-10 PE5 | 8.6 | 10.0 | 103 | 49 | 62 | 40 | 1.4 | ● |
| 087-049-10 PE5 | 8.7 | 10.0 | 103 | 49 | 62 | 40 | 1.4 | ● |
| 088-049-10 PE5 | 8.8 | 10.0 | 103 | 49 | 62 | 40 | 1.4 | ● |
| 089-049-10 PE5 | 8.9 | 10.0 | 103 | 49 | 62 | 40 | 1.4 | ● |
| 090-049-10 PE5 | 9.0 | 10.0 | 103 | 49 | 62 | 40 | 1.4 | ● |
| 091-049-10 PE5 | 9.1 | 10.0 | 103 | 49 | 62 | 40 | 1.4 | ● |
| 092-049-10 PE5 | 9.2 | 10.0 | 103 | 49 | 62 | 40 | 1.4 | ● |
| 093-049-10 PE5 | 9.3 | 10.0 | 103 | 49 | 62 | 40 | 1.5 | ● |
| 094-049-10 PE5 | 9.4 | 10.0 | 103 | 49 | 62 | 40 | 1.5 | ● |
| 095-049-10 PE5 | 9.5 | 10.0 | 103 | 49 | 62 | 40 | 1.5 | ● |
| 096-049-10 PE5 | 9.6 | 10.0 | 103 | 49 | 62 | 40 | 1.5 | ● |
| 097-049-10 PE5 | 9.7 | 10.0 | 103 | 49 | 62 | 40 | 1.5 | ● |
| 098-049-10 PE5 | 9.8 | 10.0 | 103 | 49 | 62 | 40 | 1.6 | ● |
| 099-049-10 PE5 | 9.9 | 10.0 | 103 | 49 | 62 | 40 | 1.6 | ● |

●: Standard items

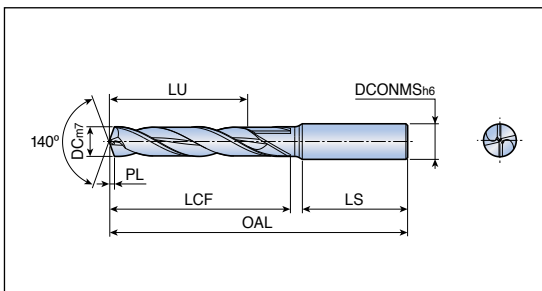


NHD...PE5

Solid carbide drills without oil holes



- Drilling depth: 4-5xdiameter

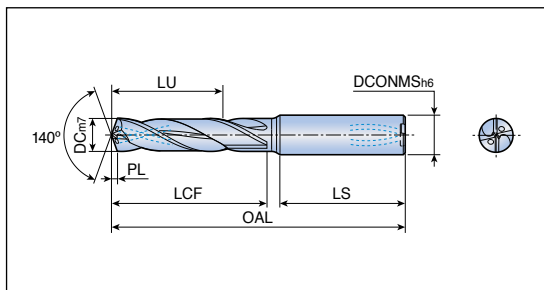


| Designation | Dimension (mm) | | | | | | | Grade |
|---------------------------|----------------|--------|-----|----|-----|-----|----|-------|
| | DC | DConMS | OAL | LU | LCF | PL | LS | |
| NHD 100-049-10 PE5 | 10.0 | 10.0 | 103 | 49 | 62 | 1.6 | 40 | ● |
| 101-056-12 PE5 | 10.1 | 12.0 | 118 | 56 | 71 | 1.6 | 45 | ● |
| 102-056-12 PE5 | 10.2 | 12.0 | 118 | 56 | 71 | 1.6 | 45 | ● |
| 103-056-12 PE5 | 10.3 | 12.0 | 118 | 56 | 71 | 1.6 | 45 | ● |
| 104-056-12 PE5 | 10.4 | 12.0 | 118 | 56 | 71 | 1.6 | 45 | ● |
| 105-056-12 PE5 | 10.5 | 12.0 | 118 | 56 | 71 | 1.6 | 45 | ● |
| 106-056-12 PE5 | 10.6 | 12.0 | 118 | 56 | 71 | 1.7 | 45 | ● |
| 107-056-12 PE5 | 10.7 | 12.0 | 118 | 56 | 71 | 1.7 | 45 | ● |
| 108-056-12 PE5 | 10.8 | 12.0 | 118 | 56 | 71 | 1.7 | 45 | ● |
| 109-056-12 PE5 | 10.9 | 12.0 | 118 | 56 | 71 | 1.7 | 45 | ● |
| 110-056-12 PE5 | 11.0 | 12.0 | 118 | 56 | 71 | 1.7 | 45 | ● |
| 111-056-12 PE5 | 11.1 | 12.0 | 118 | 56 | 72 | 1.7 | 45 | ● |
| 112-056-12 PE5 | 11.2 | 12.0 | 118 | 56 | 72 | 1.8 | 45 | ● |
| 113-056-12 PE5 | 11.3 | 12.0 | 118 | 56 | 72 | 1.8 | 45 | ● |
| 114-056-12 PE5 | 11.4 | 12.0 | 118 | 56 | 72 | 1.8 | 45 | ● |
| 115-056-12 PE5 | 11.5 | 12.0 | 118 | 56 | 72 | 1.8 | 45 | ● |
| 116-056-12 PE5 | 11.6 | 12.0 | 118 | 56 | 72 | 1.8 | 45 | ● |
| 117-056-12 PE5 | 11.7 | 12.0 | 118 | 56 | 72 | 1.9 | 45 | ● |
| 118-056-12 PE5 | 11.8 | 12.0 | 118 | 56 | 72 | 1.9 | 45 | ● |
| 119-056-12 PE5 | 11.9 | 12.0 | 118 | 56 | 72 | 1.9 | 45 | ● |
| 120-056-12 PE5 | 12.0 | 12.0 | 118 | 56 | 72 | 1.9 | 45 | ● |
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●: Standard items



Solid carbide drills with oil holes



- Drilling depth: 3xdiameter



| Designation | Dimension (mm) | | | | | | | Grade |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | TT9030 |
| NHD 030-014-06 PI3 | 3.0 | 6.0 | 62 | 14 | 21 | 34 | 0.5 | ● |
| 031-014-06 PI3 | 3.1 | 6.0 | 62 | 14 | 21 | 34 | 0.5 | ● |
| 032-014-06 PI3 | 3.2 | 6.0 | 62 | 14 | 21 | 34 | 0.5 | ● |
| 033-014-06 PI3 | 3.3 | 6.0 | 62 | 14 | 21 | 34 | 0.5 | ● |
| 034-014-06 PI3 | 3.4 | 6.0 | 62 | 14 | 21 | 34 | 0.5 | ● |
| 035-014-06 PI3 | 3.5 | 6.0 | 62 | 14 | 21 | 34 | 0.6 | ● |
| 036-014-06 PI3 | 3.6 | 6.0 | 62 | 14 | 21 | 34 | 0.6 | ● |
| 037-014-06 PI3 | 3.7 | 6.0 | 62 | 14 | 21 | 34 | 0.6 | ● |
| 038-017-06 PI3 | 3.8 | 6.0 | 66 | 17 | 25 | 35 | 0.6 | ● |
| 039-017-06 PI3 | 3.9 | 6.0 | 66 | 17 | 25 | 35 | 0.6 | ● |
| 040-017-06 PI3 | 4.0 | 6.0 | 66 | 17 | 25 | 35 | 0.6 | ● |
| 041-017-06 PI3 | 4.1 | 6.0 | 66 | 17 | 25 | 35 | 0.7 | ● |
| 042-017-06 PI3 | 4.2 | 6.0 | 66 | 17 | 25 | 35 | 0.7 | ● |
| 043-017-06 PI3 | 4.3 | 6.0 | 66 | 17 | 25 | 35 | 0.7 | ● |
| 044-017-06 PI3 | 4.4 | 6.0 | 66 | 17 | 25 | 35 | 0.7 | ● |
| 045-017-06 PI3 | 4.5 | 6.0 | 66 | 17 | 25 | 35 | 0.7 | ● |
| 046-017-06 PI3 | 4.6 | 6.0 | 66 | 17 | 25 | 35 | 0.7 | ● |
| 047-017-06 PI3 | 4.7 | 6.0 | 66 | 17 | 25 | 35 | 0.8 | ● |
| 048-020-06 PI3 | 4.8 | 6.0 | 66 | 20 | 29 | 36 | 0.8 | ● |
| 049-020-06 PI3 | 4.9 | 6.0 | 66 | 20 | 29 | 36 | 0.8 | ● |
| 050-020-06 PI3 | 5.0 | 6.0 | 66 | 20 | 29 | 36 | 0.8 | ● |
| 051-020-06 PI3 | 5.1 | 6.0 | 66 | 20 | 29 | 36 | 0.8 | ● |
| 052-020-06 PI3 | 5.2 | 6.0 | 66 | 20 | 29 | 36 | 0.8 | ● |
| 053-020-06 PI3 | 5.3 | 6.0 | 66 | 20 | 29 | 36 | 0.8 | ● |
| 054-020-06 PI3 | 5.4 | 6.0 | 66 | 20 | 29 | 36 | 0.8 | ● |
| 055-020-06 PI3 | 5.5 | 6.0 | 66 | 20 | 29 | 36 | 0.9 | ● |
| 056-020-06 PI3 | 5.6 | 6.0 | 66 | 20 | 29 | 36 | 0.9 | ● |
| 057-020-06 PI3 | 5.7 | 6.0 | 66 | 20 | 29 | 36 | 0.9 | ● |
| 058-020-06 PI3 | 5.8 | 6.0 | 66 | 20 | 29 | 36 | 0.9 | ● |
| 059-020-06 PI3 | 5.9 | 6.0 | 66 | 20 | 29 | 36 | 0.9 | ● |
| 060-020-06 PI3 | 6.0 | 6.0 | 66 | 20 | 29 | 36 | 0.9 | ● |
| 061-024-08 PI3 | 6.1 | 8.0 | 79 | 24 | 35 | 36 | 1.0 | ● |
| 062-024-08 PI3 | 6.2 | 8.0 | 79 | 24 | 35 | 36 | 1.0 | ● |
| 063-024-08 PI3 | 6.3 | 8.0 | 79 | 24 | 35 | 36 | 1.0 | ● |
| 064-024-08 PI3 | 6.4 | 8.0 | 79 | 24 | 35 | 36 | 1.0 | ● |

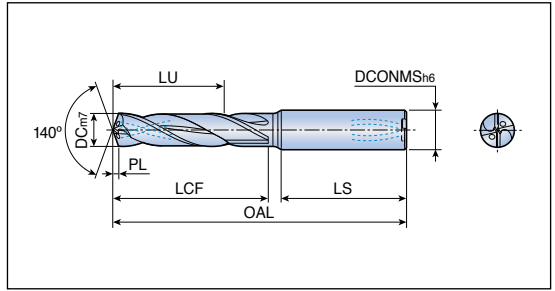
●: Standard items



Solid carbide drills with oil holes



- Drilling depth: 3xdiameter



| Designation | Dimension (mm) | | | | | | | Grade |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | TT9030 |
| NHD 065-024-08 PI3 | 6.5 | 8.0 | 79 | 24 | 35 | 36 | 1.0 | ● |
| 066-024-08 PI3 | 6.6 | 8.0 | 79 | 24 | 35 | 36 | 1.0 | ● |
| 067-024-08 PI3 | 6.7 | 8.0 | 79 | 24 | 35 | 36 | 1.1 | ● |
| 068-024-08 PI3 | 6.8 | 8.0 | 79 | 24 | 35 | 36 | 1.1 | ● |
| 069-024-08 PI3 | 6.9 | 8.0 | 79 | 24 | 35 | 36 | 1.1 | ● |
| 070-024-08 PI3 | 7.0 | 8.0 | 79 | 24 | 35 | 36 | 1.1 | ● |
| 071-029-08 PI3 | 7.1 | 8.0 | 79 | 29 | 42 | 36 | 1.1 | ● |
| 072-029-08 PI3 | 7.2 | 8.0 | 79 | 29 | 42 | 36 | 1.1 | ● |
| 073-029-08 PI3 | 7.3 | 8.0 | 79 | 29 | 42 | 36 | 1.1 | ● |
| 074-029-08 PI3 | 7.4 | 8.0 | 79 | 29 | 42 | 36 | 1.2 | ● |
| 075-029-08 PI3 | 7.5 | 8.0 | 79 | 29 | 42 | 36 | 1.2 | ● |
| 076-029-08 PI3 | 7.6 | 8.0 | 79 | 29 | 42 | 36 | 1.2 | ● |
| 077-029-08 PI3 | 7.7 | 8.0 | 79 | 29 | 42 | 36 | 1.2 | ● |
| 078-029-08 PI3 | 7.8 | 8.0 | 79 | 29 | 42 | 36 | 1.2 | ● |
| 079-029-08 PI3 | 7.9 | 8.0 | 79 | 29 | 42 | 36 | 1.3 | ● |
| 080-029-08 PI3 | 8.0 | 8.0 | 79 | 29 | 42 | 36 | 1.3 | ● |
| 081-035-10 PI3 | 8.1 | 10.0 | 89 | 35 | 48 | 40 | 1.3 | ● |
| 082-035-10 PI3 | 8.2 | 10.0 | 89 | 35 | 48 | 40 | 1.3 | ● |
| 083-035-10 PI3 | 8.3 | 10.0 | 89 | 35 | 48 | 40 | 1.3 | ● |
| 084-035-10 PI3 | 8.4 | 10.0 | 89 | 35 | 48 | 40 | 1.3 | ● |
| 085-035-10 PI3 | 8.5 | 10.0 | 89 | 35 | 48 | 40 | 1.3 | ● |
| 086-035-10 PI3 | 8.6 | 10.0 | 89 | 35 | 48 | 40 | 1.4 | ● |
| 087-035-10 PI3 | 8.7 | 10.0 | 89 | 35 | 48 | 40 | 1.4 | ● |
| 088-035-10 PI3 | 8.8 | 10.0 | 89 | 35 | 48 | 40 | 1.4 | ● |
| 089-035-10 PI3 | 8.9 | 10.0 | 89 | 35 | 48 | 40 | 1.4 | ● |
| 090-035-10 PI3 | 9.0 | 10.0 | 89 | 35 | 48 | 40 | 1.4 | ● |
| 091-035-10 PI3 | 9.1 | 10.0 | 89 | 35 | 48 | 40 | 1.4 | ● |
| 092-035-10 PI3 | 9.2 | 10.0 | 89 | 35 | 48 | 40 | 1.4 | ● |
| 093-035-10 PI3 | 9.3 | 10.0 | 89 | 35 | 48 | 40 | 1.5 | ● |
| 094-035-10 PI3 | 9.4 | 10.0 | 89 | 35 | 48 | 40 | 1.5 | ● |
| 095-035-10 PI3 | 9.5 | 10.0 | 89 | 35 | 48 | 40 | 1.5 | ● |
| 096-035-10 PI3 | 9.6 | 10.0 | 89 | 35 | 48 | 40 | 1.5 | ● |
| 097-035-10 PI3 | 9.7 | 10.0 | 89 | 35 | 48 | 40 | 1.5 | ● |
| 098-035-10 PI3 | 9.8 | 10.0 | 89 | 35 | 48 | 40 | 1.6 | ● |
| 099-035-10 PI3 | 9.9 | 10.0 | 89 | 35 | 48 | 40 | 1.6 | ● |

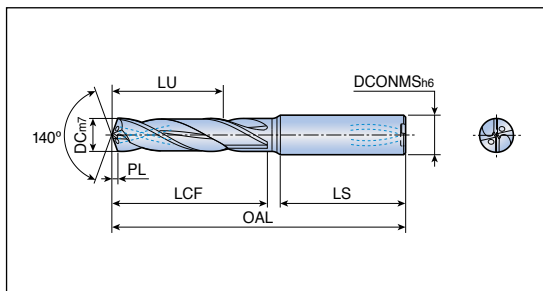
●: Standard items



NHD...PI3



Solid carbide drills with oil holes



• Drilling depth: 3x diameter



| Designation | Dimension (mm) | | | | | | | Grade TT9030 |
|---------------------------|----------------|--------|-----|----|-----|----|-----|-----------------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | |
| NHD 100-035-10 PI3 | 10.0 | 10.0 | 89 | 35 | 48 | 40 | 1.6 | ● |
| 101-040-12 PI3 | 10.1 | 12.0 | 102 | 40 | 55 | 45 | 1.6 | ● |
| 102-040-12 PI3 | 10.2 | 12.0 | 102 | 40 | 55 | 45 | 1.6 | ● |
| 103-040-12 PI3 | 10.3 | 12.0 | 102 | 40 | 55 | 45 | 1.6 | ● |
| 104-040-12 PI3 | 10.4 | 12.0 | 102 | 40 | 55 | 45 | 1.6 | ● |
| 105-040-12 PI3 | 10.5 | 12.0 | 102 | 40 | 55 | 45 | 1.6 | ● |
| 106-040-12 PI3 | 10.6 | 12.0 | 102 | 40 | 55 | 45 | 1.7 | ● |
| 107-040-12 PI3 | 10.7 | 12.0 | 102 | 40 | 55 | 45 | 1.7 | ● |
| 108-040-12 PI3 | 10.8 | 12.0 | 102 | 40 | 55 | 45 | 1.7 | ● |
| 109-040-12 PI3 | 10.9 | 12.0 | 102 | 40 | 55 | 45 | 1.7 | ● |
| 110-040-12 PI3 | 11.0 | 12.0 | 102 | 40 | 55 | 45 | 1.7 | ● |
| 111-040-12 PI3 | 11.1 | 12.0 | 102 | 40 | 56 | 45 | 1.7 | ● |
| 112-040-12 PI3 | 11.2 | 12.0 | 102 | 40 | 56 | 45 | 1.8 | ● |
| 113-040-12 PI3 | 11.3 | 12.0 | 102 | 40 | 56 | 45 | 1.8 | ● |
| 114-040-12 PI3 | 11.4 | 12.0 | 102 | 40 | 56 | 45 | 1.8 | ● |
| 115-040-12 PI3 | 11.5 | 12.0 | 102 | 40 | 56 | 45 | 1.8 | ● |
| 116-040-12 PI3 | 11.6 | 12.0 | 102 | 40 | 56 | 45 | 1.8 | ● |
| 117-040-12 PI3 | 11.7 | 12.0 | 102 | 40 | 56 | 45 | 1.9 | ● |
| 118-040-12 PI3 | 11.8 | 12.0 | 102 | 40 | 56 | 45 | 1.9 | ● |
| 119-040-12 PI3 | 11.9 | 12.0 | 102 | 40 | 56 | 45 | 1.9 | ● |
| 120-040-12 PI3 | 12.0 | 12.0 | 102 | 40 | 56 | 45 | 1.9 | ● |
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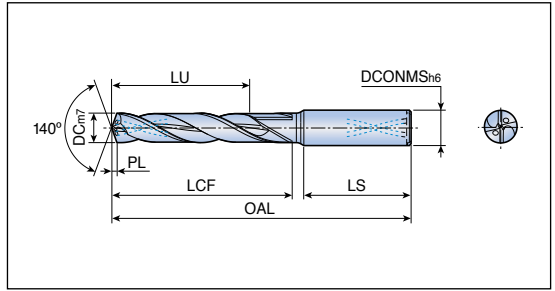


• Standard items

Solid carbide drills with oil holes



• Drilling depth: 4-5x diameter



| Designation | Dimension (mm) | | | | | | | Grade |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | TT9030 |
| NHD 030-023-06 PI5 | 3.0 | 6.0 | 66 | 23 | 29 | 34 | 0.5 | ● |
| 031-023-06 PI5 | 3.1 | 6.0 | 66 | 23 | 29 | 34 | 0.5 | ● |
| 032-023-06 PI5 | 3.2 | 6.0 | 66 | 23 | 29 | 34 | 0.5 | ● |
| 033-023-06 PI5 | 3.3 | 6.0 | 66 | 23 | 29 | 34 | 0.5 | ● |
| 034-023-06 PI5 | 3.4 | 6.0 | 66 | 23 | 29 | 34 | 0.5 | ● |
| 035-023-06 PI5 | 3.5 | 6.0 | 66 | 23 | 29 | 34 | 0.6 | ● |
| 036-023-06 PI5 | 3.6 | 6.0 | 66 | 23 | 29 | 34 | 0.6 | ● |
| 037-023-06 PI5 | 3.7 | 6.0 | 66 | 23 | 29 | 34 | 0.6 | ● |
| 038-029-06 PI5 | 3.8 | 6.0 | 74 | 29 | 37 | 35 | 0.6 | ● |
| 039-029-06 PI5 | 3.9 | 6.0 | 74 | 29 | 37 | 35 | 0.6 | ● |
| 040-029-06 PI5 | 4.0 | 6.0 | 74 | 29 | 37 | 35 | 0.6 | ● |
| 041-029-06 PI5 | 4.1 | 6.0 | 74 | 29 | 37 | 35 | 0.7 | ● |
| 042-029-06 PI5 | 4.2 | 6.0 | 74 | 29 | 37 | 35 | 0.7 | ● |
| 043-029-06 PI5 | 4.3 | 6.0 | 74 | 29 | 37 | 35 | 0.7 | ● |
| 044-029-06 PI5 | 4.4 | 6.0 | 74 | 29 | 37 | 35 | 0.7 | ● |
| 045-029-06 PI5 | 4.5 | 6.0 | 74 | 29 | 37 | 35 | 0.7 | ● |
| 046-029-06 PI5 | 4.6 | 6.0 | 74 | 29 | 37 | 35 | 0.7 | ● |
| 047-029-06 PI5 | 4.7 | 6.0 | 74 | 29 | 37 | 35 | 0.8 | ● |
| 048-035-06 PI5 | 4.8 | 6.0 | 82 | 35 | 45 | 36 | 0.8 | ● |
| 049-035-06 PI5 | 4.9 | 6.0 | 82 | 35 | 45 | 36 | 0.8 | ● |
| 050-035-06 PI5 | 5.0 | 6.0 | 82 | 35 | 45 | 36 | 0.8 | ● |
| 051-035-06 PI5 | 5.1 | 6.0 | 82 | 35 | 45 | 36 | 0.8 | ● |
| 052-035-06 PI5 | 5.2 | 6.0 | 82 | 35 | 45 | 36 | 0.8 | ● |
| 053-035-06 PI5 | 5.3 | 6.0 | 82 | 35 | 45 | 36 | 0.8 | ● |
| 054-035-06 PI5 | 5.4 | 6.0 | 82 | 35 | 45 | 36 | 0.8 | ● |
| 055-035-06 PI5 | 5.5 | 6.0 | 82 | 35 | 45 | 36 | 0.9 | ● |
| 056-035-06 PI5 | 5.6 | 6.0 | 82 | 35 | 45 | 36 | 0.9 | ● |
| 057-035-06 PI5 | 5.7 | 6.0 | 82 | 35 | 45 | 36 | 0.9 | ● |
| 058-035-06 PI5 | 5.8 | 6.0 | 82 | 35 | 45 | 36 | 0.9 | ● |
| 059-035-06 PI5 | 5.9 | 6.0 | 82 | 35 | 45 | 36 | 0.9 | ● |
| 060-035-06 PI5 | 6.0 | 6.0 | 82 | 35 | 45 | 36 | 0.9 | ● |
| 061-043-08 PI5 | 6.1 | 8.0 | 91 | 43 | 54 | 36 | 1.0 | ● |
| 062-043-08 PI5 | 6.2 | 8.0 | 91 | 43 | 54 | 36 | 1.0 | ● |
| 063-043-08 PI5 | 6.3 | 8.0 | 91 | 43 | 54 | 36 | 1.0 | ● |
| 064-043-08 PI5 | 6.4 | 8.0 | 91 | 43 | 54 | 36 | 1.0 | ● |

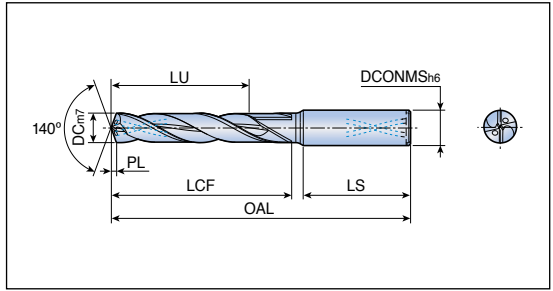
●: Standard items



NHD...PI5



Solid carbide drills with oil holes



- Drilling depth: 4-5xdiameter



| Designation | Dimension (mm) | | | | | | | Grade |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | TT9030 |
| NHD 065-043-08 PI5 | 6.5 | 8.0 | 91 | 43 | 54 | 36 | 1.0 | ● |
| 066-043-08 PI5 | 6.6 | 8.0 | 91 | 43 | 54 | 36 | 1.0 | ● |
| 067-043-08 PI5 | 6.7 | 8.0 | 91 | 43 | 54 | 36 | 1.1 | ● |
| 068-043-08 PI5 | 6.8 | 8.0 | 91 | 43 | 54 | 36 | 1.1 | ● |
| 069-043-08 PI5 | 6.9 | 8.0 | 91 | 43 | 54 | 36 | 1.1 | ● |
| 070-043-08 PI5 | 7.0 | 8.0 | 91 | 43 | 54 | 36 | 1.1 | ● |
| 071-043-08 PI5 | 7.1 | 8.0 | 91 | 43 | 54 | 36 | 1.1 | ● |
| 072-043-08 PI5 | 7.2 | 8.0 | 91 | 43 | 54 | 36 | 1.1 | ● |
| 073-043-08 PI5 | 7.3 | 8.0 | 91 | 43 | 54 | 36 | 1.1 | ● |
| 074-043-08 PI5 | 7.4 | 8.0 | 91 | 43 | 54 | 36 | 1.2 | ● |
| 075-043-08 PI5 | 7.5 | 8.0 | 91 | 43 | 54 | 36 | 1.2 | ● |
| 076-043-08 PI5 | 7.6 | 8.0 | 91 | 43 | 54 | 36 | 1.2 | ● |
| 077-043-08 PI5 | 7.7 | 8.0 | 91 | 43 | 54 | 36 | 1.2 | ● |
| 078-043-08 PI5 | 7.8 | 8.0 | 91 | 43 | 54 | 36 | 1.2 | ● |
| 079-043-08 PI5 | 7.9 | 8.0 | 91 | 43 | 54 | 36 | 1.3 | ● |
| 080-043-08 PI5 | 8.0 | 8.0 | 91 | 43 | 54 | 36 | 1.3 | ● |
| 081-049-10 PI5 | 8.1 | 10.0 | 103 | 49 | 62 | 40 | 1.3 | ● |
| 082-049-10 PI5 | 8.2 | 10.0 | 103 | 49 | 62 | 40 | 1.3 | ● |
| 083-049-10 PI5 | 8.3 | 10.0 | 103 | 49 | 62 | 40 | 1.3 | ● |
| 084-049-10 PI5 | 8.4 | 10.0 | 103 | 49 | 62 | 40 | 1.3 | ● |
| 085-049-10 PI5 | 8.5 | 10.0 | 103 | 49 | 62 | 40 | 1.3 | ● |
| 086-049-10 PI5 | 8.6 | 10.0 | 103 | 49 | 62 | 40 | 1.4 | ● |
| 087-049-10 PI5 | 8.7 | 10.0 | 103 | 49 | 62 | 40 | 1.4 | ● |
| 088-049-10 PI5 | 8.8 | 10.0 | 103 | 49 | 62 | 40 | 1.4 | ● |
| 089-049-10 PI5 | 8.9 | 10.0 | 103 | 49 | 62 | 40 | 1.4 | ● |
| 090-049-10 PI5 | 9.0 | 10.0 | 103 | 49 | 62 | 40 | 1.4 | ● |
| 091-049-10 PI5 | 9.1 | 10.0 | 103 | 49 | 62 | 40 | 1.4 | ● |
| 092-049-10 PI5 | 9.2 | 10.0 | 103 | 49 | 62 | 40 | 1.4 | ● |
| 093-049-10 PI5 | 9.3 | 10.0 | 103 | 49 | 62 | 40 | 1.5 | ● |
| 094-049-10 PI5 | 9.4 | 10.0 | 103 | 49 | 62 | 40 | 1.5 | ● |
| 095-049-10 PI5 | 9.5 | 10.0 | 103 | 49 | 62 | 40 | 1.5 | ● |
| 096-049-10 PI5 | 9.6 | 10.0 | 103 | 49 | 62 | 40 | 1.5 | ● |
| 097-049-10 PI5 | 9.7 | 10.0 | 103 | 49 | 62 | 40 | 1.5 | ● |
| 098-049-10 PI5 | 9.8 | 10.0 | 103 | 49 | 62 | 40 | 1.6 | ● |
| 099-049-10 PI5 | 9.9 | 10.0 | 103 | 49 | 62 | 40 | 1.6 | ● |

●: Standard items

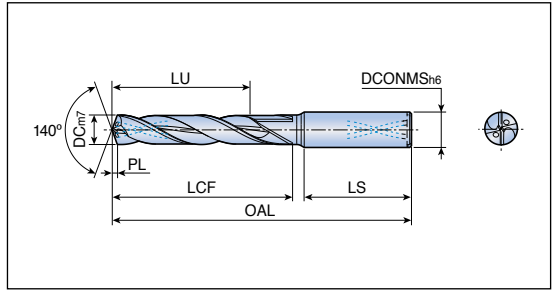


NHD...PI5

Solid carbide drills with oil holes



- Drilling depth: 4-5x diameter

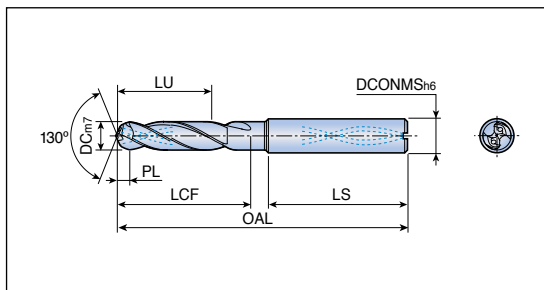


| Designation | Dimension (mm) | | | | | | | Grade TT9030 |
|---------------------------|----------------|--------|-----|----|-----|----|-----|-----------------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | |
| NHD 100-049-10 PI5 | 10.0 | 10.0 | 103 | 49 | 62 | 40 | 1.6 | • |
| 101-056-12 PI5 | 10.1 | 12.0 | 118 | 56 | 71 | 45 | 1.6 | • |
| 102-056-12 PI5 | 10.2 | 12.0 | 118 | 56 | 71 | 45 | 1.6 | • |
| 103-056-12 PI5 | 10.3 | 12.0 | 118 | 56 | 71 | 45 | 1.6 | • |
| 104-056-12 PI5 | 10.4 | 12.0 | 118 | 56 | 71 | 45 | 1.6 | • |
| 105-056-12 PI5 | 10.5 | 12.0 | 118 | 56 | 71 | 45 | 1.6 | • |
| 106-056-12 PI5 | 10.6 | 12.0 | 118 | 56 | 71 | 45 | 1.7 | • |
| 107-056-12 PI5 | 10.7 | 12.0 | 118 | 56 | 71 | 45 | 1.7 | • |
| 108-056-12 PI5 | 10.8 | 12.0 | 118 | 56 | 71 | 45 | 1.7 | • |
| 109-056-12 PI5 | 10.9 | 12.0 | 118 | 56 | 71 | 45 | 1.7 | • |
| 110-056-12 PI5 | 11.0 | 12.0 | 118 | 56 | 71 | 45 | 1.7 | • |
| 111-056-12 PI5 | 11.1 | 12.0 | 118 | 56 | 72 | 45 | 1.7 | • |
| 112-056-12 PI5 | 11.2 | 12.0 | 118 | 56 | 72 | 45 | 1.8 | • |
| 113-056-12 PI5 | 11.3 | 12.0 | 118 | 56 | 72 | 45 | 1.8 | • |
| 114-056-12 PI5 | 11.4 | 12.0 | 118 | 56 | 72 | 45 | 1.8 | • |
| 115-056-12 PI5 | 11.5 | 12.0 | 118 | 56 | 72 | 45 | 1.8 | • |
| 116-056-12 PI5 | 11.6 | 12.0 | 118 | 56 | 72 | 45 | 1.8 | • |
| 117-056-12 PI5 | 11.7 | 12.0 | 118 | 56 | 72 | 45 | 1.9 | • |
| 118-056-12 PI5 | 11.8 | 12.0 | 118 | 56 | 72 | 45 | 1.9 | • |
| 119-056-12 PI5 | 11.9 | 12.0 | 118 | 56 | 72 | 45 | 1.9 | • |
| 120-056-12 PI5 | 12.0 | 12.0 | 118 | 56 | 72 | 45 | 1.9 | • |
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•: Standard items



Solid carbide drills with oil holes for cast iron machining



- Drilling depth: 3xdiameter



| Designation | Dimension (mm) | | | | | | | Grade |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | TT9030 |
| NHD 030-014-06 KI3 | 3.0 | 6.0 | 62 | 14 | 20 | 34 | 1.4 | ● |
| 033-014-06 KI3 | 3.3 | 6.0 | 62 | 14 | 20 | 34 | 1.6 | ● |
| 035-014-06 KI3 | 3.5 | 6.0 | 62 | 14 | 20 | 34 | 1.7 | ● |
| 040-017-06 KI3 | 4.0 | 6.0 | 66 | 17 | 24 | 35 | 1.9 | ● |
| 041-017-06 KI3 | 4.1 | 6.0 | 66 | 17 | 24 | 35 | 2.0 | ● |
| 042-017-06 KI3 | 4.2 | 6.0 | 66 | 17 | 24 | 35 | 2.0 | ● |
| 045-017-06 KI3 | 4.5 | 6.0 | 66 | 17 | 24 | 35 | 2.2 | ● |
| 046-017-06 KI3 | 4.6 | 6.0 | 66 | 17 | 24 | 35 | 2.2 | ● |
| 050-020-06 KI3 | 5.0 | 6.0 | 66 | 20 | 27 | 36 | 2.4 | ● |
| 051-020-06 KI3 | 5.1 | 6.0 | 66 | 20 | 27 | 36 | 2.5 | ● |
| 052-020-06 KI3 | 5.2 | 6.0 | 66 | 20 | 27 | 36 | 2.5 | ● |
| 055-020-06 KI3 | 5.5 | 6.0 | 66 | 20 | 27 | 36 | 2.6 | ● |
| 060-020-06 KI3 | 6.0 | 6.0 | 66 | 20 | 27 | 36 | 2.9 | ● |
| 061-024-08 KI3 | 6.1 | 8.0 | 79 | 24 | 34 | 36 | 2.9 | ● |
| 065-024-08 KI3 | 6.5 | 8.0 | 79 | 24 | 34 | 36 | 3.1 | ● |
| 067-024-08 KI3 | 6.7 | 8.0 | 79 | 24 | 34 | 36 | 3.2 | ● |
| 068-024-08 KI3 | 6.8 | 8.0 | 79 | 24 | 34 | 36 | 3.3 | ● |
| 070-024-08 KI3 | 7.0 | 8.0 | 79 | 24 | 34 | 36 | 3.4 | ● |
| 075-029-08 KI3 | 7.5 | 8.0 | 79 | 29 | 40 | 36 | 3.6 | ● |
| 080-029-08 KI3 | 8.0 | 8.0 | 79 | 29 | 40 | 36 | 3.8 | ● |
| 081-035-10 KI3 | 8.1 | 10.0 | 89 | 35 | 45 | 40 | 3.9 | ● |
| 085-035-10 KI3 | 8.5 | 10.0 | 89 | 35 | 45 | 40 | 4.1 | ● |
| 087-035-10 KI3 | 8.7 | 10.0 | 89 | 35 | 45 | 40 | 4.2 | ● |
| 089-035-10 KI3 | 8.9 | 10.0 | 89 | 35 | 45 | 40 | 4.3 | ● |
| 090-035-10 KI3 | 9.0 | 10.0 | 89 | 35 | 45 | 40 | 4.3 | ● |
| 095-035-10 KI3 | 9.5 | 10.0 | 89 | 35 | 45 | 40 | 4.6 | ● |
| 100-035-10 KI3 | 10.0 | 10.0 | 89 | 35 | 45 | 40 | 4.8 | ● |
| 103-040-12 KI3 | 10.3 | 12.0 | 102 | 40 | 53 | 45 | 4.9 | ● |
| 105-040-12 KI3 | 10.5 | 12.0 | 102 | 40 | 53 | 45 | 5.0 | ● |
| 110-040-12 KI3 | 11.0 | 12.0 | 102 | 40 | 53 | 45 | 5.3 | ● |
| 115-040-12 KI3 | 11.5 | 12.0 | 102 | 40 | 53 | 45 | 5.5 | ● |
| 120-040-12 KI3 | 12.0 | 12.0 | 102 | 40 | 53 | 45 | 5.8 | ● |
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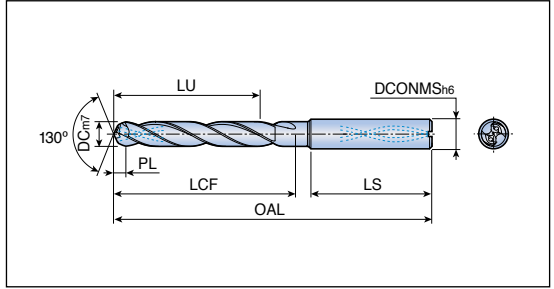


●: Standard items

Solid carbide drills with oil holes for cast iron machining



- Drilling depth: 5xdiameter



| Designation | Dimension (mm) | | | | | | | Grade |
|---------------------------|----------------|--------|-----|----|-----|----|-----|--------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | TT9030 |
| NHD 030-023-06 KI5 | 3.0 | 6.0 | 66 | 23 | 27 | 34 | 1.4 | ● |
| 033-023-06 KI5 | 3.3 | 6.0 | 66 | 23 | 27 | 34 | 1.6 | ● |
| 035-023-06 KI5 | 3.5 | 6.0 | 66 | 23 | 27 | 34 | 1.7 | ● |
| 040-029-06 KI5 | 4.0 | 6.0 | 74 | 29 | 34 | 35 | 1.9 | ● |
| 042-029-06 KI5 | 4.2 | 6.0 | 74 | 29 | 34 | 35 | 2.0 | ● |
| 045-029-06 KI5 | 4.5 | 6.0 | 74 | 29 | 35 | 35 | 2.2 | ● |
| 046-029-06 KI5 | 4.6 | 6.0 | 74 | 29 | 35 | 35 | 2.2 | ● |
| 050-035-06 KI5 | 5.0 | 6.0 | 82 | 35 | 43 | 36 | 2.4 | ● |
| 052-035-06 KI5 | 5.2 | 6.0 | 82 | 35 | 43 | 36 | 2.5 | ● |
| 055-035-06 KI5 | 5.5 | 6.0 | 82 | 35 | 43 | 36 | 2.6 | ● |
| 060-035-06 KI5 | 6.0 | 6.0 | 82 | 35 | 43 | 36 | 2.9 | ● |
| 065-043-08 KI5 | 6.5 | 8.0 | 91 | 43 | 52 | 36 | 3.1 | ● |
| 067-043-08 KI5 | 6.7 | 8.0 | 91 | 43 | 52 | 36 | 3.2 | ● |
| 068-043-08 KI5 | 6.8 | 8.0 | 91 | 43 | 52 | 36 | 3.3 | ● |
| 070-043-08 KI5 | 7.0 | 8.0 | 91 | 43 | 52 | 36 | 3.4 | ● |
| 075-043-08 KI5 | 7.5 | 8.0 | 91 | 43 | 52 | 36 | 3.6 | ● |
| 080-043-08 KI5 | 8.0 | 8.0 | 91 | 43 | 52 | 36 | 3.8 | ● |
| 081-049-10 KI5 | 8.1 | 10.0 | 103 | 49 | 59 | 40 | 3.9 | ● |
| 085-049-10 KI5 | 8.5 | 10.0 | 103 | 49 | 59 | 40 | 4.1 | ● |
| 087-049-10 KI5 | 8.7 | 10.0 | 103 | 49 | 59 | 40 | 4.2 | ● |
| 089-049-10 KI5 | 8.9 | 10.0 | 103 | 49 | 59 | 40 | 4.3 | ● |
| 090-049-10 KI5 | 9.0 | 10.0 | 103 | 49 | 59 | 40 | 4.3 | ● |
| 095-049-10 KI5 | 9.5 | 10.0 | 103 | 49 | 59 | 40 | 4.6 | ● |
| 100-049-10 KI5 | 10.0 | 10.0 | 103 | 49 | 59 | 40 | 4.8 | ● |
| 103-056-12 KI5 | 10.3 | 12.0 | 118 | 56 | 69 | 45 | 4.9 | ● |
| 105-056-12 KI5 | 10.5 | 12.0 | 118 | 56 | 69 | 45 | 5.0 | ● |
| 110-056-12 KI5 | 11.0 | 12.0 | 118 | 56 | 69 | 45 | 5.3 | ● |
| 115-056-12 KI5 | 11.5 | 12.0 | 118 | 56 | 69 | 45 | 5.5 | ● |
| 120-056-12 KI5 | 12.0 | 12.0 | 118 | 56 | 69 | 45 | 5.8 | ● |
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●: Standard items

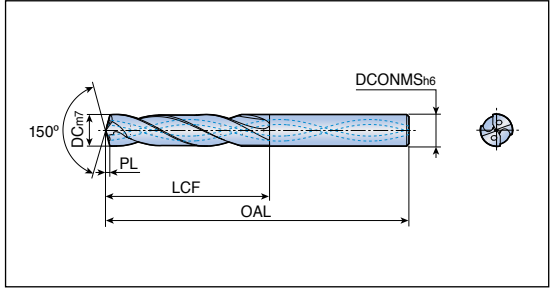


SHO 3...-PH

Solid pilot drills for solid long drill



- M.Q.L drilling is available



| Designation | Dimension (mm) | | | | | Grade |
|---------------------|----------------|--------|------|------|-----|--------|
| | DC | DCONMS | OAL | LCF | PL | TT9030 |
| SHO 30403-PH | 4.03 | 4 | 66.5 | 24.5 | 0.5 | ● |
| 30503-PH | 5.03 | 5 | 68.6 | 30.6 | 0.6 | ● |
| 30603-PH | 6.03 | 6 | 68.7 | 30.7 | 0.7 | ● |
| 30703-PH | 7.03 | 7 | 73.8 | 35.8 | 0.8 | ● |
| 30803-PH | 8.03 | 8 | 79.9 | 41.9 | 0.9 | ● |
| 30903-PH | 9.03 | 9 | 91.0 | 49.0 | 1.0 | ● |
| 31003-PH | 10.03 | 10 | 91.1 | 49.1 | 1.1 | ● |
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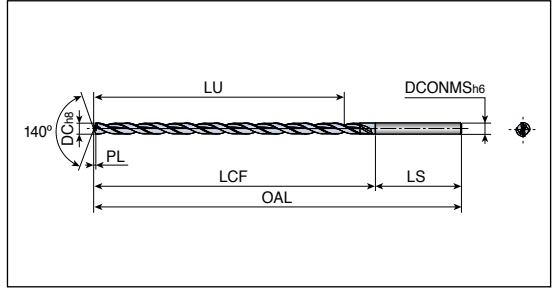


●: Standard items

Solid long drills with oil holes



- Drilling depth: 10/15/20xdiameter
- M.Q.L drilling is available



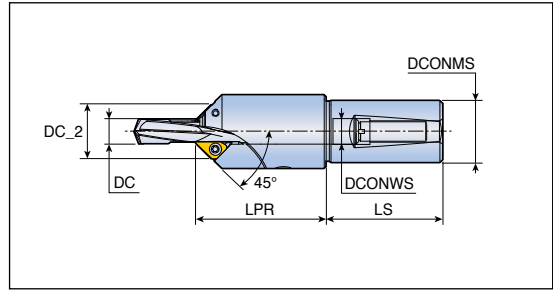
| Designation | Dimension (mm) | | | | | | | Grade |
|------------------|----------------|--------|-------|-----|-------|----|-----|--------|
| | DC | DCONMS | OAL | LU | LCF | LS | PL | TT9030 |
| SHO 10040 | 4.0 | 4 | 105.6 | 50 | 55.6 | 50 | 0.6 | ● |
| 10050 | 5.0 | 5 | 115.8 | 60 | 65.8 | 50 | 0.8 | ● |
| 10060 | 6.0 | 6 | 131.0 | 76 | 81.0 | 50 | 1.0 | ● |
| 10070 | 7.0 | 7 | 141.1 | 86 | 91.1 | 50 | 1.1 | ● |
| 10080 | 8.0 | 8 | 156.3 | 98 | 106.3 | 50 | 1.3 | ● |
| 10090 | 9.0 | 9 | 171.4 | 108 | 116.4 | 55 | 1.4 | ● |
| 10100 | 10.0 | 10 | 191.6 | 123 | 131.6 | 60 | 1.6 | ● |
| 15040 | 4.0 | 4 | 125.6 | 70 | 75.6 | 50 | 0.6 | ● |
| 15050 | 5.0 | 5 | 140.8 | 85 | 90.8 | 50 | 0.8 | ● |
| 15060 | 6.0 | 6 | 161.0 | 106 | 111.0 | 50 | 1.0 | ● |
| 15070 | 7.0 | 7 | 176.1 | 121 | 126.1 | 50 | 1.1 | ● |
| 15080 | 8.0 | 8 | 196.3 | 138 | 146.3 | 50 | 1.3 | ● |
| 15090 | 9.0 | 9 | 221.4 | 153 | 161.4 | 60 | 1.4 | ● |
| 15100 | 10.0 | 10 | 241.6 | 173 | 181.6 | 60 | 1.6 | ● |
| 20040 | 4.0 | 4 | 140.6 | 85 | 90.6 | 50 | 0.6 | ● |
| 20050 | 5.0 | 5 | 165.8 | 110 | 115.8 | 50 | 0.8 | ● |
| 20060 | 6.0 | 6 | 191.0 | 136 | 141.0 | 50 | 1.0 | ● |
| 20070 | 7.0 | 7 | 211.1 | 156 | 161.1 | 50 | 1.1 | ● |
| 20080 | 8.0 | 8 | 231.3 | 173 | 181.3 | 50 | 1.3 | ● |
| 20090 | 9.0 | 9 | 266.4 | 198 | 206.4 | 60 | 1.4 | ● |
| 20100 | 10.0 | 10 | 286.6 | 218 | 226.6 | 60 | 1.6 | ● |
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●: Standard items

T-CHAMFER...T1

Chamfering tools with solid carbide drill



| Designation | DC | Dimension (mm) | | | | | Insert |
|------------------------------|-----------|----------------|------|--------|------|----|----------------|
| | | DCONWS | DC_2 | DCONMS | LPR | LS | |
| T-CHAMFER 080-20T1-06 | 7.1-8.0 | 8 | 18.8 | 20 | 47.4 | 50 | XCGT 06...-C.. |
| 090-20T1-06 | 8.1-9.0 | 9 | 19.8 | 20 | 47.4 | 50 | D178 |
| 100-32T1-09 | 9.1-10.0 | 10 | 24.9 | 32 | 67.3 | 60 | XCGT 09...-C.. |
| 110-32T1-09 | 10.1-11.0 | 11 | 25.9 | 32 | 67.3 | 60 | D178 |
| 120-32T1-09 | 11.1-12.0 | 12 | 26.9 | 32 | 67.3 | 60 | |
| 130-32T1-09 | 12.1-13.0 | 13 | 27.9 | 32 | 67.3 | 60 | |
| 140-32T1-09 | 13.1-14.0 | 14 | 28.4 | 32 | 67.3 | 60 | |
| 150-32T1-09 | 14.1-15.0 | 15 | 29.4 | 32 | 67.3 | 60 | |
| 160-32T1-09 | 15.1-16.0 | 16 | 30.4 | 32 | 67.3 | 60 | |
| 170-32T1-09 | 16.1-17.0 | 17 | 31.4 | 32 | 67.3 | 60 | |
| 180-32T1-09 | 17.1-18.0 | 18 | 32.4 | 32 | 67.3 | 60 | |
| 190-32T1-09 | 18.1-19.0 | 19 | 33.4 | 32 | 75.0 | 60 | |
| 200-32T1-09 | 19.1-20.0 | 20 | 34.4 | 32 | 75.0 | 60 | |
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Spare parts

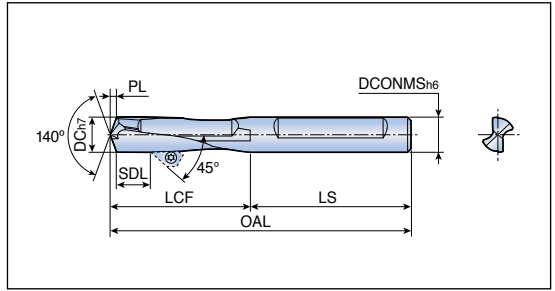
| Designation | Side screw | Back screw | L-wrench | Insert screw | Wrench |
|----------------------------|---------------|------------|----------|--------------|--------|
| T-CHAMFER 080 - 090 | SS M6x1x6 | M6x1-SP | L-W 3 | TS 25064I | TD 8 |
| T-CHAMFER 100 - 200 | SS M10x1.5x10 | M10x1.5-SP | L-W 5 | TS 40093I | TD 15 |
| | | | | | |
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SHD 3...-CF



Solid carbide drills for T-CHAMFER



| Designation | Dimension (mm) | | | | | | | | Grade |
|--------------------|----------------|--------|-------|------|----|--------------------|--------------------|-----|-------|
| | DC | DCONMS | OAL | LCF | LS | SDL _{min} | SDL _{max} | PL | |
| SHD 3080-CF | 8.0 | 8.0 | 80.3 | 37.3 | 43 | 9.5 | 17.5 | 1.3 | ● |
| 3090-CF | 9.0 | 9.0 | 85.4 | 42.4 | 43 | 13.0 | 23.5 | 1.4 | ● |
| 3100-CF | 10.0 | 10.0 | 90.6 | 47.6 | 43 | 15.5 | 25.0 | 1.6 | ● |
| 3110-CF | 11.0 | 11.0 | 96.8 | 53.8 | 43 | 21.5 | 30.0 | 1.8 | ● |
| 3120-CF | 12.0 | 12.0 | 103.9 | 60.9 | 43 | 25.5 | 37.0 | 1.9 | ● |
| 3130-CF | 13.0 | 13.0 | 104.1 | 61.1 | 43 | 25.5 | 35.0 | 2.1 | ● |
| 3150-CF | 15.0 | 15.0 | 113.4 | 65.4 | 48 | 26.5 | 40.5 | 2.4 | ● |
| 3170-CF | 17.0 | 17.0 | 121.7 | 71.7 | 50 | 24.5 | 44.0 | 2.7 | ● |
| 3180-CF | 18.0 | 18.0 | 125.9 | 75.9 | 50 | 26.5 | 48.0 | 2.9 | ● |
| 3190-CF | 19.0 | 19.0 | 130.0 | 76 | 54 | 26.5 | 49.0 | 3.0 | ● |
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- 'SDL' is factored with a 45° insert positioned in insert pocket
- Solid carbide drill with internal coolant holes is available on request
- : Standard items

| Insert | Chamfer angle (°) | Chamfer size |
|----------------------|-------------------|--------------|
| XCGT 0603-C30 | 30° | 1.5 |
| 0603-C45 | 45° | 4.5 |
| 0603-C60 | 60° | 2.5 |
| XCGT 0903-C30 | 30° | 1.5 |
| 0903-C45 | 45° | 6.0 |
| 0903-C60 | 60° | 3.5 |

• The maximum chamfer size is obtained when using the smallest drill diameter in the drilling range

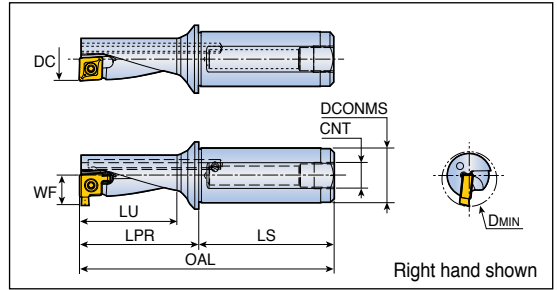
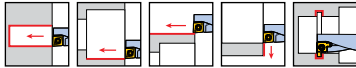
TCAP...-2.25DN



Multi-function toolholders - 2.25xD



- Internal coolant



| Designation | Dimension (mm) | | | | | | | | Insert | |
|--------------------------|----------------|--------|------|------|------|----|------|--------|-------------------------------|---------------|
| | DC | DCONMS | WF | LU | LPR | LS | DMIN | CNT | For drilling, boring, turning | For grooving |
| TCAP 08R/L-2.25DN | 8 | 12 | - | 18.0 | 22.5 | 42 | - | G 1/16 | XCM(G)T 04...TC/TA | - |
| 10R/L-2.25DN-GV | 10 | 12 | 7.1 | 22.5 | 27.5 | 42 | 12.0 | G 1/16 | XCM(G)T 05...TC/TA | XCMT 05R...GV |
| 12R/L-2.25DN-GV | 12 | 16 | 8.5 | 27.0 | 33.0 | 45 | 14.5 | G 1/8 | XCM(G)T 06...TC/TA | XCMT 06R...GV |
| 14R/L-2.25DN-GV | 14 | 16 | 9.5 | 31.5 | 38.5 | 45 | 16.5 | G 1/8 | XCM(G)T 07...TC/TA | XCMT 07R...GV |
| 16R/L-2.25DN-GV | 16 | 20 | 11.1 | 36.0 | 44.0 | 50 | 19.0 | G 1/8 | XCM(G)T 08...TC/TA | XCMT 08R...GV |
| 20R/L-2.25DN-GV | 20 | 25 | 13.2 | 45.0 | 55.0 | 56 | 23.5 | G 1/8 | XCM(G)T 10...TC/TA | XCMT 10R...GV |
| 25R/L-2.25DN-GV | 25 | 32 | 16.5 | 56.2 | 69.0 | 61 | 29.0 | G 1/8 | XCM(G)T 13...TC/TA | XCMT 13R...GV |
| 32R/L-2.25DN-GV | 32 | 40 | 20.5 | 72.0 | 86.0 | 74 | 36.5 | G 1/8 | XCM(G)T 17...TC/TA | XCMT 17R...GV |
| | | | | | | | | | D179-180 | D179 |
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- $OAL = LPR + LS$
- Grooving insert is available for right handed type

Spare parts

| Designation | Screw | Wrench | |
|----------------|----------------|--------|-------|
| | | | |
| TCAP 08 | TS 18034I/HG-P | T 6P | |
| TCAP 10 | TS 20038I/HG-P | T 6P | |
| TCAP 12 | TS 22052I/HG-P | T 7P | |
| TCAP 14 | TS 25064I/HG-P | T 8P | |
| TCAP 16 | TS 30100I/HG-P | | TD 9P |
| TCAP 20 | TS 35088I/HG-P | | TD10P |
| TCAP 25 | TS 45A100I/HG | | TD 20 |
| TCAP 32 | TS 45A100I/HG | | TD 20 |



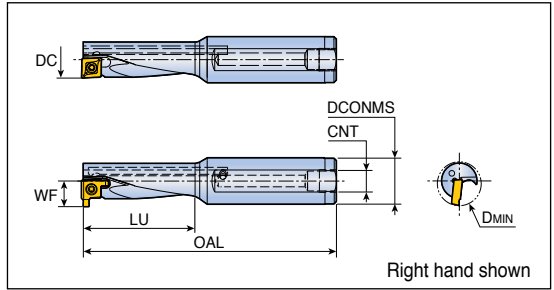
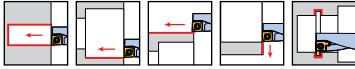
TCAP...-3.0DN



Multi-function toolholders - 3.0xD



- Internal coolant



| Designation | Dimension (mm) | | | | | | | Insert | |
|---------------------------|----------------|--------|------|----|-----|------|--------|-------------------------------|---------------|
| | DC | DCONMS | WF | LU | OAL | DMIN | CNT | For drilling, boring, turning | For grooving |
| TCAP 08R/L-3.0DN12 | 8 | 12 | - | 24 | 80 | - | G 1/16 | XCM(G)T 04...TC/TA | - |
| 10R/L-3.0DN-GV | 10 | 12 | 7.1 | 30 | 85 | 12.0 | G 1/16 | XCM(G)T 05...TC/TA | XCMT 05R...GV |
| 12R/L-3.0DN-GV | 12 | 16 | 8.5 | 36 | 95 | 14.5 | G 1/8 | XCM(G)T 06...TC/TA | XCMT 06R...GV |
| 14R/L-3.0DN-GV | 14 | 16 | 9.5 | 42 | 100 | 16.5 | G 1/8 | XCM(G)T 07...TC/TA | XCMT 07R...GV |
| 16R/L-3.0DN-GV | 16 | 20 | 11.1 | 48 | 110 | 19.0 | G 1/8 | XCM(G)T 08...TC/TA | XCMT 08R...GV |
| 20R/L-3.0DN-GV | 20 | 25 | 13.2 | 60 | 130 | 23.5 | G 1/8 | XCM(G)T 10...TC/TA | XCMT 10R...GV |
| 25R/L-3.0DN-GV | 25 | 32 | 16.5 | 75 | 150 | 29.0 | G 1/8 | XCM(G)T 13...TC/TA | XCMT 13R...GV |
| 32R/L-3.0DN-GV | 32 | 40 | 20.5 | 96 | 185 | 36.5 | G 1/8 | XCM(G)T 17...TC/TA | XCMT 17R...GV |
| | | | | | | | | D179-180 | D179 |
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- OAL = LPR+LS
- Grooving insert is available for right handed type

Spare parts

| Designation | Screw | Wrench | |
|----------------|----------------|--------|-------|
| | | | |
| TCAP 08 | TS 18034I/HG-P | T 6P | |
| TCAP 10 | TS 20038I/HG-P | T 6P | |
| TCAP 12 | TS 22052I/HG-P | T 7P | |
| TCAP 14 | TS 25064I/HG-P | T 8P | |
| TCAP 16 | TS 30100I/HG-P | | TD 9P |
| TCAP 20 | TS 35088I/HG-P | | TD10P |
| TCAP 25 | TS 45A100I/HG | | TD 20 |
| TCAP 32 | TS 45A100I/HG | | TD 20 |



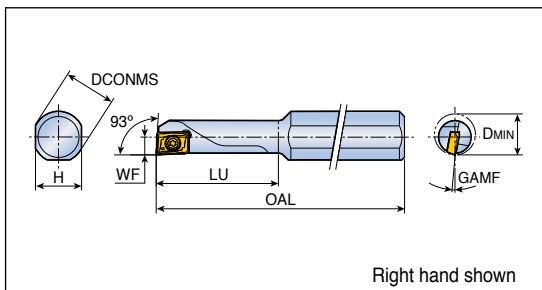
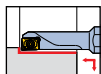
S...SXUCR/L



Boring bars with TOP-CAP inserts



- For boring
- External coolant



| Designation | Dimension (mm) | | | | | | | Insert |
|--|----------------|---|-----|------|-----|------|------|---------------------|
| | DCONMS | H | OAL | LU | WF | DMIN | GAMF | |
| S10H SXUCR/L 04-06 ⁽¹⁾ | 10 | 9 | 100 | 21 | 3.0 | 6 | 9° | XCMT 04...R/L TC |
| S10J SXUCR/L 04-07 ⁽¹⁾ | 10 | 9 | 110 | 24.5 | 3.5 | 7 | 5° | D180 |
| S10J SXUCR/L 04-08 ⁽¹⁾ | 10 | 9 | 110 | 28 | 4.0 | 8 | 2° | |
| S10K SXUCR/L 05-10 | 10 | 9 | 125 | 35 | 5.0 | 10 | 2° | XCMT 05..TC D180 |
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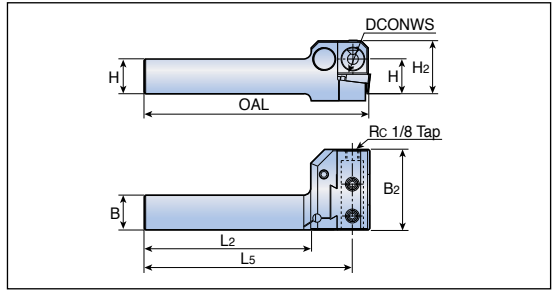
• ⁽¹⁾ Right hand Insert should be used in right hand boring bar

Spare parts

| Designation | Screw | Wrench | | |
|---------------------------|----------------|--------|--|--|
| | | | | |
| S10H SXUCR/L 04-06 | TS 18034I/HG-P | T 6P | | |
| S10J SXUCR/L 04-07 | TS 18034I/HG-P | T 6P | | |
| S10J SXUCR/L 04-08 | TS 18034I/HG-P | T 6P | | |
| S10K SXUCR/L 05-10 | TS 20038I/HG-P | T 6P | | |
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Clamping units (Centre alignment system)

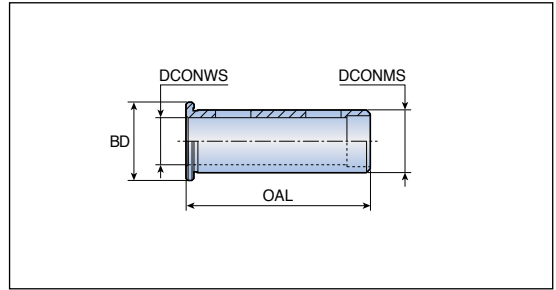


| Designation | Dimension (mm) | | | | | | | | Toolholders |
|----------------------|----------------|----|--------|----------------|----------------|----------------|----------------|-----|--|
| | H | B | DCONWS | H ₂ | B ₂ | L ₂ | L ₅ | OAL | |
| TGHR 2020-D16 | 20 | 20 | 16 | 38 | 58 | 120 | 150 | 161 | TCAP 08R/L... TCAP 10R/L... TCAP 12R/L... TCAP 14R/L... |
| 2525-D16 | 25 | 25 | 16 | 38 | 58 | 120 | 150 | 161 | |
| | | | | | | | | | |
| | | | | | | | | | |
| 2525-D25 | 25 | 25 | 25 | 56 | 75 | 120 | 157 | 174 | TCAP 16R/L... TCAP 20R/L... |
| | | | | | | | | | |
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Spare parts

| Designation | Block | Wedge | Snap ring | Wedge screw | Mounting pin | Mounting pin screw | Mounting screw | | Lock screw | Wrench |
|----------------------|-------------|------------|-----------|-------------|--------------|--------------------|---------------------|------------------|---------------|----------------|
| | | | | | | | | | | |
| TGHR 2020-D16 | TGHR-D16-BL | TGHR-WD | WSR 4 | TGH-WS | TGH-MPI | TGH-MPS | SSxM8 1.25X10-C | SSxM8 x1.25x8 | - | L-W 4 |
| TGHR 2525-D16 | | | | | | | | | | |
| TGHR 2525-D25 | TGHR-D25-BL | TGHR-WD-25 | WSR 4 | TGH-WS-25 | TGH-MPI-25 | TGH-MPS-25 | SS M10 x1.5x12-C | SS M101.5x10 | SH M6x1x20 | L-W 4 L-W 5 |
| | | | | | | | | | | |
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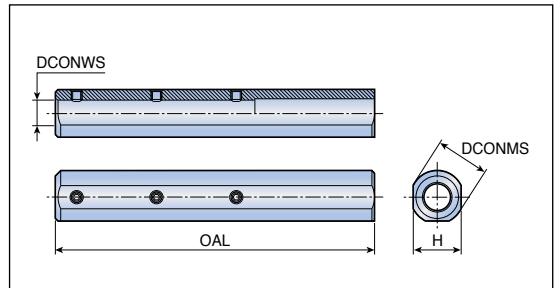
Sleeves for clamping unit



| Designation | Dimension (mm) | | | | Toolholders |
|------------------|----------------|--------|----|-----|---------------|
| | DCONMS | DCONWS | BD | OAL | |
| TSL 16-12 | 16 | 12 | 20 | 47 | TCAP 10R/L... |
| 25-20 | 25 | 20 | 32 | 55 | TCAP 16R/L... |

TBSL

Sleeves for boring bar



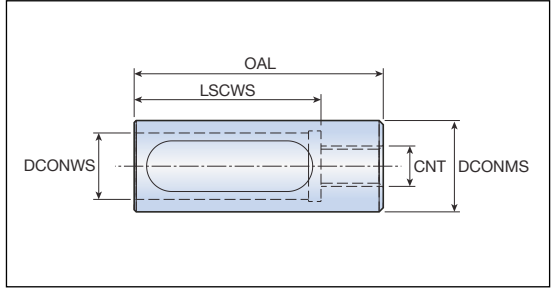
| Designation | Dimension (mm) | | | |
|-----------------------|----------------|--------|-----|----|
| | DCONMS | DCONWS | OAL | H |
| TBSL 20-10-120 | 20 | 10 | 120 | 18 |

Spare parts

| Designation | Screw | Wrench | | |
|-----------------------|-------------|------------|--|--|
| TBSL 20-10-120 | SS M4x0.7x4 | L-W 2 | | |
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TSL-NC

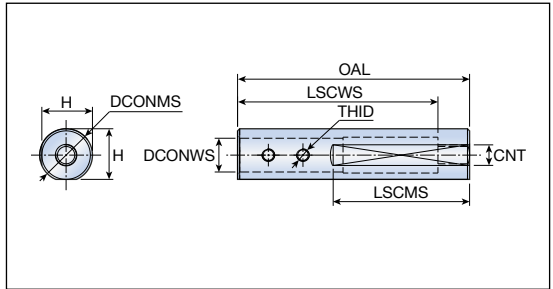
Drill sleeves for Swiss type automatic lathes (Fixed type, internal coolant)



| Designation | Dimension (mm) | | | | |
|------------------------|----------------|--------|-------|-----|--------|
| | DCONMS | DCONWS | LSCWS | OAL | CNT |
| TSL-NC 19.05-12 | 19.05 | 12.0 | 45 | 60 | Rc 1/8 |
| 19.05-16 | 19.05 | 16.0 | 45 | 60 | Rc 1/8 |
| 20-12 | 20.0 | 12.0 | 45 | 60 | Rc 1/8 |
| 20-16 | 20.0 | 16.0 | 45 | 60 | Rc 1/8 |
| 22-16 | 22.0 | 16.0 | 45 | 60 | Rc 1/8 |
| 25-20 | 25.0 | 20.0 | 45 | 60 | Rc 1/8 |
| 25.4-20 | 25.4 | 20.0 | 45 | 60 | Rc 1/8 |
| 32-25 | 32.0 | 25.0 | 45 | 60 | Rc 1/8 |

TSL-SW

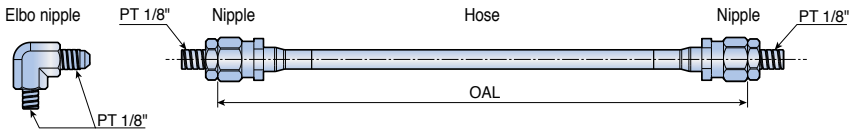
Drill sleeves for Swiss type automatic lathes (Adjustable type, internal coolant)



| Designation | Dimension (mm) | | | | | | | |
|---------------------|----------------|--------|-------|-------|-----|------|------|--------|
| | DCONMS | DCONWS | LSCWS | LSCMS | OAL | H | THID | CNT |
| TSL-SW 22-12 | 22.0 | 12.0 | 95 | 65 | 110 | 21.0 | M6 | Rc 1/8 |
| 25-12 | 25.0 | 12.0 | 95 | 65 | 110 | 24.0 | M8 | Rc 1/8 |
| 25-16 | 25.0 | 16.0 | 95 | 65 | 110 | 24.0 | M6 | Rc 1/8 |
| 25.4-12 | 25.4 | 12.0 | 95 | 65 | 110 | 24.4 | M8 | Rc 1/8 |
| 25.4-16 | 25.4 | 16.0 | 95 | 65 | 110 | 24.4 | M6 | Rc 1/8 |
| 32-12 | 32.0 | 12.0 | 95 | 65 | 110 | 31.0 | M8 | Rc 1/8 |
| 32-16 | 32.0 | 16.0 | 95 | 65 | 110 | 31.0 | M8 | Rc 1/8 |
| 32-20 | 32.0 | 20.0 | 95 | 65 | 110 | 31.0 | M8 | Rc 1/8 |

Accessories

Hose set





* Hose set components: 1 hose, 2 nipples, 1 elbo nipple

| Designation | Dimension (mm) | |
|----------------------------|----------------|---------------------|
| | OAL (mm) | Max. pressure (bar) |
| S-TSL HOSE R1/8-220 | 220 | 100 |
| R1/8-350 | 350 | 100 |
| | | |
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• Hose set is ordered separately

Spare parts

| Designation | Mounting screw | Wrench | | |
|-----------------------|---|---|--|--|
| |  |  | | |
| TSL-SW 22-12 | SS M6X1X5 | L-W 3 | | |
| TSL-SW 25-12 | SS M8X1.25X6 | L-W 4 | | |
| TSL-SW 25-16 | SS M6X1X5 | L-W 3 | | |
| TSL-SW 25.4-12 | SS M8X1.25X6 | L-W 4 | | |
| TSL-SW 25.4-16 | SS M6X1X5 | L-W 3 | | |
| TSL-SW 32-12 | SS M8X1.25X6 | L-W 4 | | |
| TSL-SW 32-16 | SS M8X1.25X6 | L-W 4 | | |
| TSL-SW 32-20 | SS M8X1.25X6 | L-W 4 | | |
| | | | | |

Deep Drilling Tools



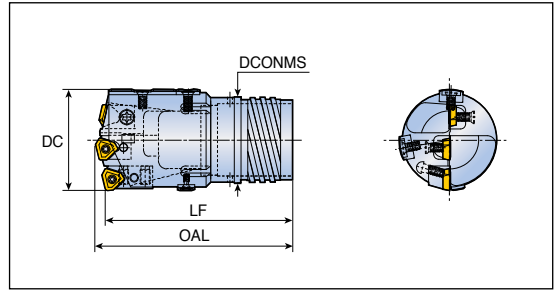
TBTA3...SE4



Single tube system



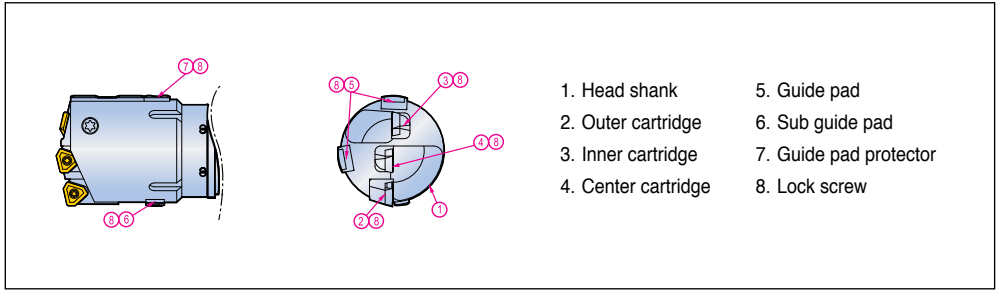
- Outer four start thread



| Designation | DC | Dimension (mm) | | | Tube | |
|----------------------------|---------------|----------------|-----|--------|-----------|---------------|
| | | LF | OAL | DCONMS | Part | Diameter (mm) |
| TBTA3- xxx.xxSE4-33 | 38.00-39.60 | 85 | 90 | 30 | BTSI 033 | 33 |
| xxx.xxSE4-36 | 39.61-43.00 | 85 | 91 | 33 | BTSI 036 | 36 |
| xxx.xxSE4-39 | 43.01-47.00 | 95 | 101 | 36 | BTSI 039 | 39 |
| xxx.xxSE4-43 | 47.01-51.70 | 95 | 102 | 39 | BTSI 043 | 43 |
| xxx.xxSE4-47 | 51.71-56.20 | 100 | 107 | 43 | BTSI 047 | 47 |
| xxx.xxSE4-51 | 56.21-60.60 | 110 | 118 | 47 | BTSI 051 | 51 |
| xxx.xxSE4-56A | 60.61-64.99 | 110 | 119 | 51 | BTSI 056A | 56 |
| xxx.xxSE4-56B | 65.00-66.99 | 150 | 159 | 52 | BTSI 056B | 56 |
| xxx.xxSE4-62 | 67.00-72.99 | 150 | 159 | 58 | BTSI 062 | 62 |
| xxx.xxSE4-68 | 73.00-79.99 | 150 | 160 | 63 | BTSI 068 | 68 |
| xxx.xxSE4-75 | 80.00-86.99 | 180 | 191 | 70 | BTSI 075 | 75 |
| xxx.xxSE4-82 | 87.00-99.99 | 180 | 193 | 77 | BTSI 082 | 82 |
| xxx.xxSE4-94 | 100.00-106.99 | 180 | 193 | 89 | BTSI 094 | 94 |
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| Assembly D102 | Tube D135 | Cutting Condition D216 |
|-----------------------------|-------------------------|--------------------------------------|

Assembly of TBTA3 series



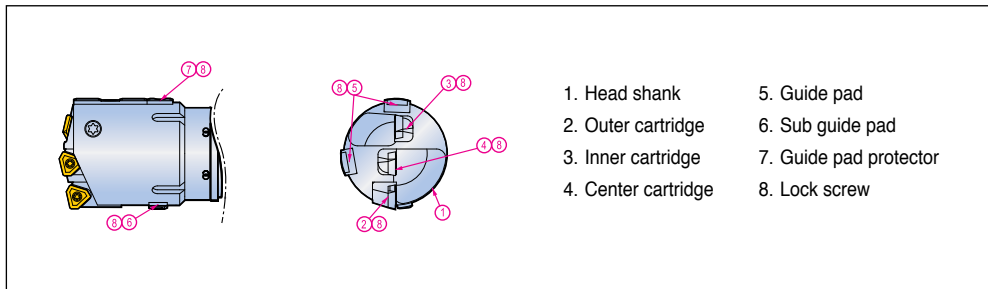
| Parts | | Diameter (mm) | | | | |
|-----------|---------------------|--|--|--|--|--|
| | | 38.00-39.99 | 40.00-44.99 | 45.00-47.99 | 48.00-51.99 | 52.00-54.99 |
| Cartridge | Outer | PERC 05R | PERC 402-04 | PERC 402-04 | PERC 402-04 | PERC 402-32 |
| | Adjust screw | AS0003-5 | AS0004-8 | AS0004-8 | AS0004-8 | AS0005-10 |
| | Wrench | H1.5 | H2 | H2 | H2 | H2.5 |
| | Screw | LS1803RH | LS1803.5RH | LS1803.5RH | LS1803.5RH | LS1805RH |
| | Wrench | H2 | H2.5 | H2.5 | H2.5 | H3 |
| | Inner | CENC 05R | CENC 05R | CENC 05R | CENC 402-04 | CENC 402-04 |
| | Screw | CSTB3 | CSTB3 | CSTB3 | CSTB3.5 | CSTB3.5 |
| | Wrench | T-9D | T-9D | T-9D | T-15D | T-15D |
| | Center | CENC 05R | CENC 05R | CENC 402-04 | CENC 402-04 | CENC 402-04 |
| | Screw | CSTB3 | CSTB3 | CSTB3.5 | CSTB3.5 | CSTB3.5 |
| Wrench | T-9D | T-9D | T-15D | T-15D | T-15D | |
| Insert | Outer | NPMX 080308R-G | TPMX 140308R-G | TPMX 140308R-G | TPMX 140308R-G | TPMX 170408R-G |
| | Screw | CSTB2.2 | CSTB2.5 | CSTB2.5 | CSTB2.5 | CSTB3.5D |
| | Wrench | T-7D | T-8D | T-8D | T-8D | T-9D |
| | Inner | NPMX 080308R-G | NPMX 080308R-G | NPMX 080308R-G | TPMX 140308R-G | TPMX 140308R-G |
| | Screw | CSTB2.2 | CSTB2.2 | CSTB2.2 | CSTB2.5 | CSTB2.5 |
| | Wrench | T-7D | T-7D | T-7D | T-8D | T-8D |
| | Center | NPMX 080308R-G | NPMX 080308R-G | TPMX 140308R-G | TPMX 140308R-G | TPMX 140308R-G |
| Screw | CSTB2.2 | CSTB2.2 | CSTB2.5 | CSTB2.5 | CSTB2.5 | |
| Wrench | T-7D | T-7D | T-8D | T-8D | T-8D | |
| Pad | Guide pad | PAD-GP08-25-155-DC-SB PAD-GP08-25-155-DC-SC | PAD-GP08-25-155-DC-SB PAD-GP08-25-155-DC-SC | PAD-GP10-35-200-DC-SB PAD-GP10-35-200-DC-SC | PAD-GP10-35-200-DC-SB PAD-GP10-35-200-DC-SC | PAD-GP10-35-200-DC-SB PAD-GP10-35-200-DC-SC |
| | Screw | CSTB3S | CSTB3S | CSTB4S | CSTB4S | CSTB4S |
| | Wrench | T-9D | T-9D | T-15D | T-15D | T-15D |
| | Guide pad protector | PAD-P08 | PAD-P08 | PAD-P10 | PAD-P10 | PAD-P10 |
| | Screw | CSTB3S | CSTB3S | CSTB4S | CSTB4S | CSTB4S |
| | Wrench | T-9D | T-9D | T-15D | T-15D | T-15D |
| | Sub guide pad | PAD-S08 | PAD-S08 | PAD-S08 | PAD-S08 | PAD-S08 |
| | Screw | CSTB3S | CSTB3S | CSTB3S | CSTB3S | CSTB3S |
| | Wrench | T-9D | T-9D | T-9D | T-9D | T-9D |
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TBTA3 Series



Assembly of TBTA3 series

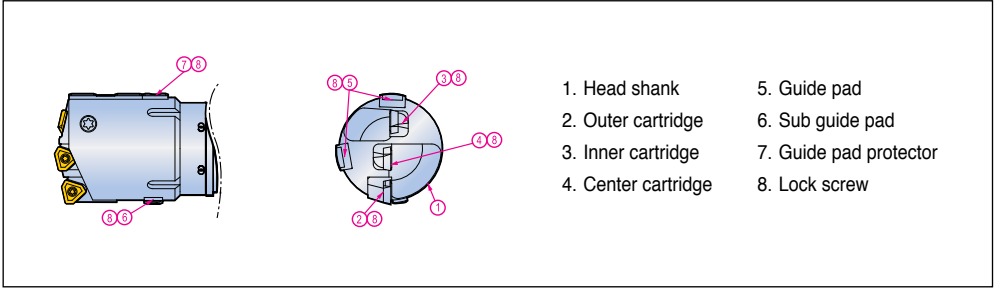


- | | |
|---------------------|------------------------|
| 1. Head shank | 5. Guide pad |
| 2. Outer cartridge | 6. Sub guide pad |
| 3. Inner cartridge | 7. Guide pad protector |
| 4. Center cartridge | 8. Lock screw |

| Parts | Diameter (mm) | | | | | |
|------------------|---------------------|--|--|--|--|--|
| | 55.00-57.99 | 58.00-59.99 | 60.00-63.99 | 64.00-67.99 | 68.00-77.99 | |
| Cartridge | Outer | PERC 402-32 | PERC 402-32 | PERC 402-32 | PERC 402-43 | PERC 402-32 |
| | Adjust screw | AS0005-10 | AS0005-10 | AS0005-10 | AS0005-15 | AS0005-10 |
| | Wrench | H2.5 | H2.5 | H2.5 | H2.5 | H2.5 |
| | Screw | LS1805RH | LS1805RH | LS1805RH | LS1806RH | LS1805RH |
| | Wrench | H3 | H3 | H3 | H4 | H3 |
| | Inner | CENC 402-04 | CENC 402-32 | CENC 402-32 | CENC 402-32 | CENC 402-43 |
| | Screw | CSTB3.5 | CSTA5 | CSTA5 | CSTA5 | LS1206 |
| | Wrench | T-15D | T-15D | T-15D | T-15D | H3 |
| | Center | CENC 402-32 | CENC 402-32 | CENC 402-32 | CENC 402-32 | CENC 402-43 |
| | Screw | CSTA5 | CSTA5 | CSTA5 | CSTA5 | LS1206 |
| Wrench | T-15D | T-15D | T-15D | T-15D | H3 | |
| Insert | Outer | TPMX 170408R-G | TPMX 170408R-G | TPMX 170408R-G | TPMX 240512R-G | TPMX 170408R-G |
| | Screw | CSTB3.5D | CSTB3.5D | CSTB3.5D | CSTB4M | CSTB3.5D |
| | Wrench | T-9D | T-9D | T-9D | T-15D | T-9D |
| | Inner | TPMX 140308R-G | TPMX 170408R-G | TPMX 170408R-G | TPMX 170408R-G | TPMX 240512R-G |
| | Screw | CSTB2.5 | CSTB3.5D | CSTB3.5D | CSTB3.5D | CSTB4M |
| | Wrench | T-8D | T-9D | T-9D | T-9D | T-15D |
| | Center | TPMX 170408R-G | TPMX 170408R-G | TPMX 170408R-G | TPMX 170408R-G | TPMX 240512R-G |
| Screw | CSTB3.5D | CSTB3.5D | CSTB3.5D | CSTB3.5D | CSTB4M | |
| Wrench | T-9D | T-9D | T-9D | T-9D | T-15D | |
| Pad | Guide pad | PAD-GP10-35-200-DC-SB PAD-GP10-35-200-DC-SC | PAD-GP10-35-200-DC-SB PAD-GP10-35-200-DC-SC | PAD-GP14-40-250-DC-SB PAD-GP14-40-250-DC-SC | PAD-GP14-40-250-DC-SB PAD-GP14-40-250-DC-SC | PAD-GP14-40-250-DC-SB PAD-GP14-40-250-DC-SC |
| | Screw | CSTB4S | CSTB4S | CSTA5S | CSTA5S | CSTA5S |
| | Wrench | T-15D | T-15D | T-15D | T-15D | T-15D |
| | Guide pad protector | PAD-P10 | PAD-P10 | PAD-P14 | PAD-P14 | PAD-P14 |
| | Screw | CSTB4S | CSTB4S | CSTA5S | CSTA5S | CSTA5S |
| | Wrench | T-15D | T-15D | T-15D | T-15D | T-15D |
| | Sub guide pad | PAD-S08 | PAD-S08 | PAD-S08 | PAD-S10 | PAD-S10 |
| | Screw | CSTB3S | CSTB3S | CSTB3S | CSTB3S | CSTB3S |
| | Wrench | T-9D | T-9D | T-9D | T-9D | T-9D |
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Assembly of TBTA3 series



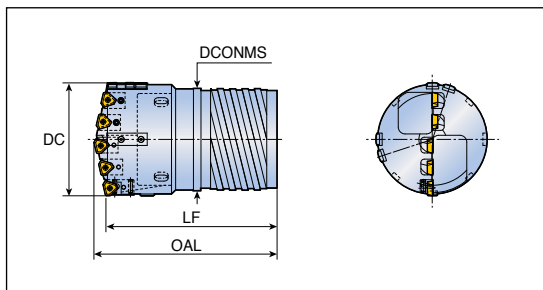
| Parts | | Diameter (mm) | | | |
|-----------|---------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | 78.00-84.99 | 85.00-91.99 | 92.00-98.99 | 99.00-106.99 |
| Cartridge | Outer | PERC 402-43 | PERC 402-63 | PERC 402-43 | PERC 402-63 |
| | Adjust screw | AS0005-15 | AS0006-15 | AS0005-15 | AS0006-15 |
| | Wrench | H2.5 | H3 | H2.5 | H3 |
| | Screw | LS1806RH | LS1806RH | LS1806RH | LS1806RH |
| | Wrench | H4 | H4 | H4 | H4 |
| | Inner | CENC 402-43 | CENC 402-43 | CENC 402-63 | CENC 402-63 |
| | Screw | LS1206 | LS1206 | LS1206 | LS1206 |
| | Wrench | H3 | H3 | H3 | H3 |
| | Center | CENC 402-43 | CENC 402-43 | CENC 402-63 | CENC 402-63 |
| | Screw | LS1206 | LS1206 | LS1206 | LS1206 |
| Insert | Outer | TPMX 240512R-G | TPMX 280716R-G | TPMX 240512R-G | TPMX 280716R-G |
| | Screw | CSTB4M | CSTB5 | CSTB4M | CSTB5 |
| | Wrench | T-15D | T-20D | T-15D | T-20D |
| | Inner | TPMX 240512R-G | TPMX 240512R-G | TPMX 280716R-G | TPMX 280716R-G |
| | Screw | CSTB4M | CSTB4M | CSTB5 | CSTB5 |
| | Wrench | T-15D | T-15D | T-20D | T-20D |
| | Center | TPMX 240512R-G | TPMX 240512R-G | TPMX 280716R-G | TPMX 280716R-G |
| Pad | Screw | CSTB4M | CSTB4M | CSTB5 | CSTB5 |
| | Wrench | T-15D | T-15D | T-20D | T-20D |
| | Guide pad | PAD-GP14-40-250-DC-SB | PAD-GP14-40-250-DC-SB | PAD-GP14-40-250-DC-SB | PAD-GP18-40-300-DC-SB |
| | Screw | CSTB5S | CSTB5S | CSTB5S | LS1206S |
| | Wrench | T-15D | T-15D | T-15D | H3 |
| | Guide pad protector | PAD-P14 | PAD-P14 | PAD-P14 | PAD-P18 |
| | Screw | CSTB5S | CSTB5S | CSTB5S | LS1206S |
| | Wrench | T-15D | T-15D | T-15D | H3 |
| | Sub guide pad | PAD-S10 | PAD-S10 | PAD-S10 | PAD-S14 |
| | Screw | CSTB3S | CSTB3S | CSTB3S | CSTB3S |
| Wrench | T-9D | T-9D | T-9D | T-15D | |
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TBTA5...SE4



Single tube system



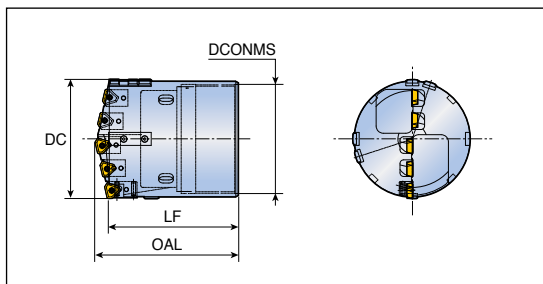
- Outer four start thread

| Designation | DC | Dimension (mm) | | | Tube | |
|-----------------------------|---------------|----------------|-----|--------|----------|---------------|
| | | LF | OAL | DCONMS | Part | Diameter (mm) |
| TBTA5- xxx.xxSE4-094 | 107.00-111.99 | 180 | 197 | 89 | BTSI 094 | 94 |
| xxx.xxSE4-106 | 112.00-123.99 | 205 | 221 | 101 | BTSI 106 | 106 |
| xxx.xxSE4-118 | 124.00-135.99 | 205 | 222 | 113 | BTSI 118 | 118 |
| xxx.xxSE4-130 | 136.00-147.99 | 205 | 223 | 125 | BTSI 130 | 130 |
| xxx.xxSE4-142 | 148.00-159.99 | 225 | 245 | 137 | BTSI 142 | 142 |
| xxx.xxSE4-154 | 160.00-168.99 | 225 | 246 | 149 | BTSI 154 | 154 |

TBTA5...SI1



Single tube system



- Inner single start thread

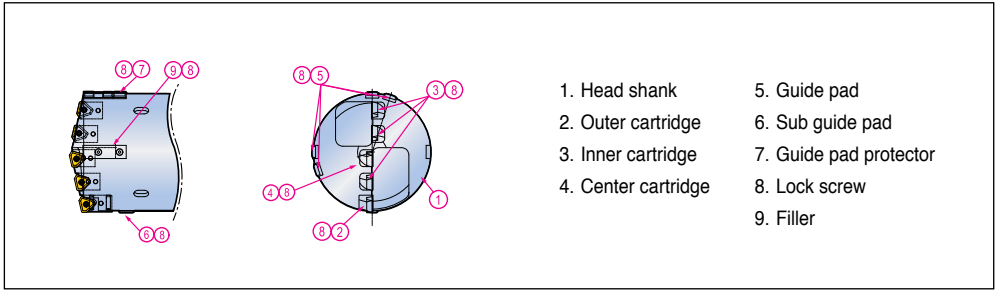
| Designation | DC | Dimension (mm) | | | Tube | |
|-----------------------------|---------------|----------------|-----|--------|----------|---------------|
| | | LF | OAL | DCONMS | Part | Diameter (mm) |
| TBTA5- xxx.xxSI1-094 | 107.00-110.99 | 150 | 164 | 90 | BTSE 094 | 94 |
| xxx.xxSI1-106 | 111.00-122.99 | 150 | 165 | 102 | BTSE 106 | 106 |
| xxx.xxSI1-118 | 123.00-134.99 | 150 | 167 | 114 | BTSE 118 | 118 |
| xxx.xxSI1-130 | 135.00-148.99 | 150 | 168 | 126 | BTSE 130 | 130 |
| xxx.xxSI1-142 | 149.00-161.99 | 150 | 170 | 139 | BTSE 142 | 142 |
| xxx.xxSI1-154 | 162.00-168.99 | 190 | 211 | 151 | BTSE 154 | 154 |

| | | |
|----------------------|------------------|-------------------------------|
| Assembly D107 | Tube D135 | Cutting Condition D216 |
|----------------------|------------------|-------------------------------|

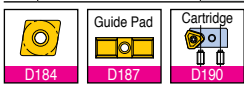
TBTA5 Series



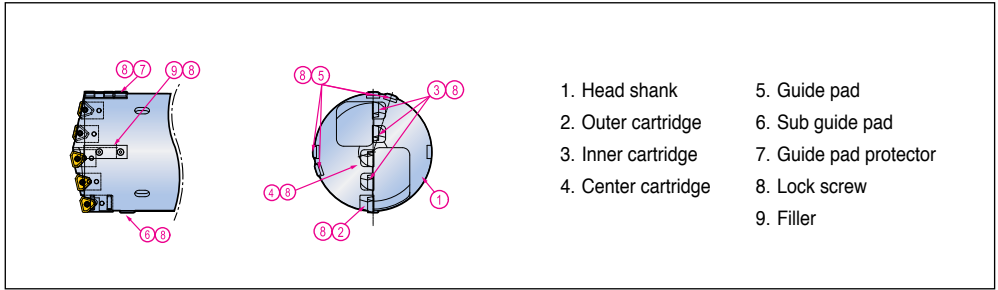
Assembly of TBTA5 series



| Parts | | Diameter (mm) | | | |
|-----------|---------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | 107.00-117.99 | 118.00-135.99 | 136.00-144.99 | 145.00-150.99 |
| Cartridge | Outer | PERC 402-43 | PERC 402-43 | PERC 402-43 | PERC 402-43 |
| | Adjust screw | AS0005-15 | AS0005-15 | AS0005-15 | AS0005-15 |
| | Wrench | H2.5 | H2.5 | H2.5 | H2.5 |
| | Screw | LS1806RH | LS1806RH | LS1806RH | LS1806RH |
| | Wrench | H4 | H4 | H4 | H4 |
| | Inner | CENC 402-32 | CENC 402-43 | CENC 402-43 | CENC 402-43 |
| | Screw | CSTA5 | LS1206 | LS1206 | LS1206 |
| | Wrench | T-15D | H3 | H3 | H3 |
| | Center | CENC 402-43 | CENC 402-43 | CENC 402-63 | CENC 402-63 |
| | Screw | LS1206 | LS1206 | LS1206 | LS1206 |
| Insert | Wrench | H3 | H3 | H3 | H3 |
| | Outer | TPMX 240512R-G | TPMX 240512R-G | TPMX 240512R-G | TPMX 240512R-G |
| | Screw | CSTB4M | CSTB4M | CSTB4M | CSTB4M |
| | Wrench | T-15D | T-15D | T-15D | T-15D |
| | Inner | TPMX 170408R-G | TPMX 240512R-G | TPMX 240512R-G | TPMX 240512R-G |
| | Screw | CSTB3.5D | CSTB4M | CSTB4M | CSTB4M |
| | Wrench | T-9D | T-15D | T-15D | T-15D |
| Center | TPMX 240512R-G | TPMX 240512R-G | TPMX 280716R-G | TPMX 280716R-G | |
| Pad | Screw | CSTB4M | CSTB4M | CSTB5 | CSTB5 |
| | Wrench | T-15D | T-15D | T-20D | T-20D |
| | Guide pad | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB |
| | Screw | PAD-GP18-40-300-DC-SC | PAD-GP18-40-300-DC-SC | PAD-GP18-40-300-DC-SC | PAD-GP18-40-300-DC-SC |
| | Wrench | LS1206S | LS1206S | LS1206S | LS1206S |
| | Wrench | H3 | H3 | H3 | H3 |
| | Guide pad protector | PAD-P18 | PAD-P18 | PAD-P18 | PAD-P18 |
| | Screw | LS1206S | LS1206S | LS1206S | LS1206S |
| | Wrench | H3 | H3 | H3 | H3 |
| | Sub guide pad | PAD-S14 | PAD-S14 | PAD-S14 | PAD-S14 |
| Screw | CSTA5S | CSTA5S | CSTA5S | CSTA5S | |
| Wrench | T-15D | T-15D | T-15D | T-15D | |
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Assembly of TBTA5 series



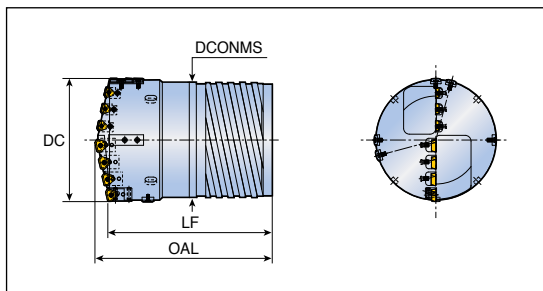
| Parts | | Diameter (mm) | | |
|-----------|---------------------|-----------------------|-----------------------|-----------------------|
| | | 151.00-156.99 | 157.00-162.99 | 163.00-168.99 |
| Cartridge | Outer | PERC 402-63 | PERC 402-63 | PERC 402-63 |
| | Adjust screw | AS0006-15 | AS0006-15 | AS0006-15 |
| | Wrench | H3 | H3 | H3 |
| | Screw | LS1806RH | LS1806RH | LS1806RH |
| | Wrench | H4 | H4 | H4 |
| | Inner | CENC 402-43 | CENC 402-43 | CENC 402-63 |
| | Screw | LS1206 | LS1206 | LS1206 |
| | Wrench | H3L | H3L | H3L |
| | Center | CENC 402-63 | CENC 402-63 | CENC 402-63 |
| | Screw | LS1206S | LS1206S | LS1206S |
| Wrench | H3L | H3L | H3L | |
| Insert | Outer | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G |
| | Screw | CSTB5 | CSTB5 | CSTB5 |
| | Wrench | T-20D | T-20D | T-20D |
| | Inner | TPMX 240512R-G | TPMX 240512R-G | TPMX 280716R-G |
| | Screw | CSTB4M | CSTB4M | CSTB5 |
| | Wrench | T-15D | T-15D | T-20D |
| | Center | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G |
| Screw | CSTB5 | CSTB5 | CSTB5 | |
| Wrench | T-20D | T-20D | T-20D | |
| Pad | Guide pad | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB |
| | | PAD-GP18-40-300-DC-SC | PAD-GP18-40-300-DC-SC | PAD-GP18-40-300-DC-SC |
| | Screw | LS1206S | LS1206S | LS1206S |
| | Wrench | H3 | H3 | H3L |
| | Guide pad protector | PAD-P18 | PAD-P18 | PAD-P18 |
| | Screw | LS1206S | LS1206S | LS1206S |
| | Wrench | H3 | H3 | H3 |
| | Sub guide pad | PAD-S14 | PAD-S14 | PAD-S14 |
| | Screw | CSTA5S | CSTA5S | CSTA5S |
| | Wrench | T-15D | T-15D | T-15D |
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TBTA7...SE4



Single tube system



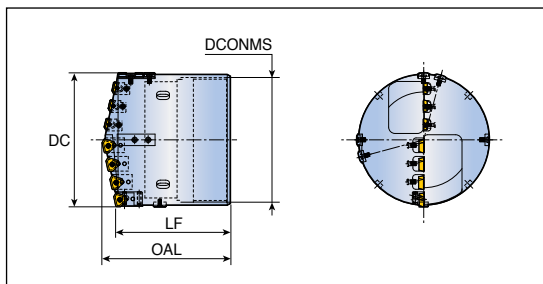
- Outer four start thread
- Double tube system also available on request

| Designation | DC | Dimension (mm) | | | Tube | |
|-----------------------------|---------------|----------------|-----|--------|----------|---------------|
| | | LF | OAL | DCONMS | Part | Diameter (mm) |
| TBTA7- xxx.xxSE4-154 | 169.00-171.99 | 225 | 246 | 149 | BTSI 154 | 154 |
| xxx.xxSE4-166 | 172.00-183.99 | 225 | 247 | 161 | BTSI 166 | 166 |
| xxx.xxSE4-178 | 184.00-195.99 | 245 | 267 | 173 | BTSI 178 | 178 |
| xxx.xxSE4-190 | 196.00-207.99 | 245 | 270 | 185 | BTSI 190 | 190 |
| xxx.xxSE4-202 | 208.00-219.99 | 245 | 271 | 197 | BTSI 202 | 202 |
| xxx.xxSE4-214 | 220.00-231.99 | 265 | 293 | 208 | BTSI 214 | 214 |
| xxx.xxSE4-226 | 232.00-232.99 | 265 | 293 | 220 | BTSI 226 | 226 |

TBTA7...SI1



Single tube system

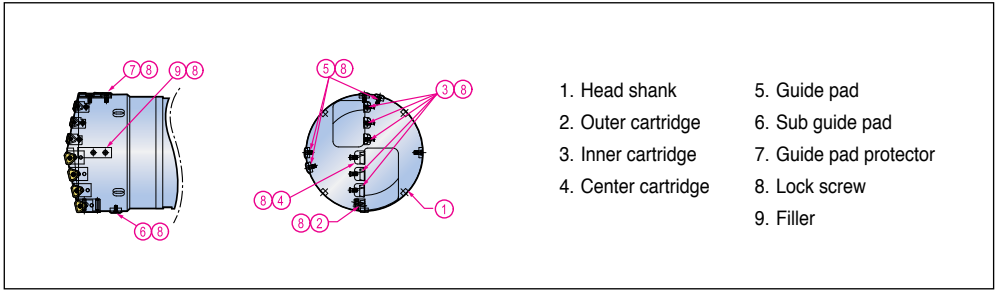


- Inner single start thread

| Designation | DC | Dimension (mm) | | | Tube | |
|-----------------------------|---------------|----------------|-----|--------|----------|---------------|
| | | LF | OAL | DCONMS | Part | Diameter (mm) |
| TBTA7- xxx.xxSI1-154 | 169.00-173.99 | 190 | 211 | 151 | BTSE 154 | 154 |
| xxx.xxSI1-166 | 174.00-185.99 | 190 | 213 | 163 | BTSE 166 | 166 |
| xxx.xxSI1-178 | 186.00-197.99 | 190 | 212 | 175 | BTSE 178 | 178 |
| xxx.xxSI1-190 | 198.00-209.99 | 190 | 215 | 187 | BTSE 190 | 190 |
| xxx.xxSI1-202 | 210.00-221.99 | 190 | 217 | 199 | BTSE 202 | 202 |
| xxx.xxSI1-214 | 222.00-232.99 | 190 | 218 | 211 | BTSE 214 | 214 |

| | | |
|----------------------|------------------|-------------------------------|
| Assembly D110 | Tube D135 | Cutting Condition D216 |
|----------------------|------------------|-------------------------------|

Assembly of TBTA7 series



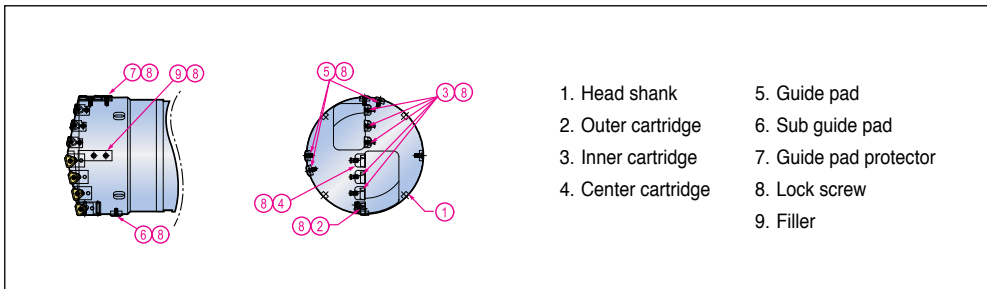
| Parts | | Diameter (mm) | | | |
|-----------|---------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | 169.00-188.99 | 189.00-196.99 | 197.00-202.99 | 203.00-208.99 |
| Cartridge | Outer | PERC 402-43 | PERC 402-43 | PERC 402-43 | PERC 402-43 |
| | Adjust screw | AS0005-15 | AS0005-15 | AS0005-15 | AS0005-15 |
| | Wrench | H2.5 | H2.5 | H2.5 | H2.5 |
| | Screw | LS1806RH | LS1806RH | LS1806RH | LS1806RH |
| | Wrench | H4 | H4 | H4 | H4 |
| | Inner | CENC 402-43 | CENC 402-43 | CENC 402-43 | CENC 402-43 |
| | Screw | LS1206 | LS1206 | LS1206 | LS1206 |
| | Wrench | H3L | H3L | H3L | H3L |
| | Center | CENC 402-43 | CENC 402-63 | CENC 402-63 | CENC 402-63 |
| | Screw | LS1206 | LS1206S | LS1206S | LS1206S |
| Insert | Outer | TPMX 240512R-G | TPMX 240512R-G | TPMX 240512R-G | TPMX 240512R-G |
| | Screw | CSTB4M | CSTB4M | CSTB4M | CSTB4M |
| | Wrench | T-15D | T-15D | T-15D | T-15D |
| | Inner | TPMX 240512R-G | TPMX 240512R-G | TPMX 240512R-G | TPMX 240512R-G |
| | Screw | CSTB4M | CSTB4M | CSTB4M | CSTB4M |
| | Wrench | T-15D | T-15D | T-15D | T-15D |
| | Center | TPMX 240512R-G | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G |
| Pad | Screw | CSTB4M | CSTB5 | CSTB5 | CSTB5 |
| | Wrench | T-15D | T-15D | T-15D | T-15D |
| | Guide pad | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB |
| | Screw | PAD-GP18-40-300-DC-SC | PAD-GP18-40-300-DC-SC | PAD-GP18-40-300-DC-SC | PAD-GP18-40-300-DC-SC |
| | Wrench | LS1206S | LS1206S | LS1206S | LS1206S |
| | Wrench | H3 | H3 | H3 | H3 |
| | Guide pad protector | PAD-P18 | PAD-P18 | PAD-P18 | PAD-P18 |
| | Screw | LS1206S | LS1206S | LS1206S | LS1206S |
| | Wrench | H3 | H3 | H3 | H3 |
| | Sub guide pad | PAD-S14 | PAD-S14 | PAD-S14 | PAD-S14 |
| Screw | CSTA5S | CSTA5S | CSTA5S | CSTA5S | |
| Wrench | T-15D | T-15D | T-15D | T-15D | |
| | | | | | |
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| | | | | | |



TBTA7 Series



Assembly of TBTA7 series



| Parts | | Diameter (mm) | | | |
|-----------|---------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | 209.00-214.99 | 215.00-220.99 | 221.00-226.99 | 227.00-232.99 |
| Cartridge | Outer | PERC 402-63 | PERC 402-63 | PERC 402-63 | PERC 402-63 |
| | Adjust screw | AS0006-15 | AS0006-15 | AS0006-15 | AS0005-15 |
| | Wrench | H3 | H3 | H3 | H3 |
| | Screw | L1806RH | L1806RH | L1806RH | L1806RH |
| | Wrench | H4 | H4 | H4 | H4 |
| | Inner | CENC 402-43 | CENC 402-43 | CENC 402-43 | CENC 402-63 |
| | Screw | LS1206 | LS1206 | LS1206 | LS1206 |
| | Wrench | H3L | H3L | H3L | H3L |
| | Center | CENC 402-63 | CENC 402-63 | CENC 402-63 | CENC 402-63 |
| | Screw | LS1206S | LS1206 | LS1206 | LS1206S |
| Insert | Outer | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G |
| | Screw | CSTB5 | CSTB5 | CSTB5 | CSTB5 |
| | Wrench | T-20D | T-20D | T-20D | T-20D |
| | Inner | TPMX 240512R-G | TPMX 240512R-G | TPMX 240512R-G | TPMX 280716R-G |
| | Screw | CSTB4M | CSTB4M | CSTB4M | CSTB5 |
| | Wrench | T-15D | T-15D | T-15D | T-15D |
| | Center | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G |
| Pad | Screw | CSTB5 | CSTB5 | CSTB5 | CSTB5 |
| | Wrench | T-20D | T-20D | T-20D | T-20D |
| | Guide pad | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB |
| | | PAD-GP18-40-300-DC-SC | PAD-GP18-40-300-DC-SC | PAD-GP18-40-300-DC-SC | PAD-GP18-40-300-DC-SC |
| | Screw | LS1206S | LS1206S | LS1206S | LS1206S |
| | Wrench | H3 | H3 | H3 | H3 |
| | Guide pad protector | PAD-P18 | PAD-P18 | PAD-P18 | PAD-P18 |
| | Screw | LS1206S | LS1206S | LS1206S | LS1206S |
| | Wrench | H3 | H3 | H3 | H3 |
| | Sub guide pad | PAD-S14 | PAD-S14 | PAD-S14 | PAD-S14 |
| Screw | CSTA5S | CSTA5S | CSTA5S | CSTA5S | |
| Wrench | T-15D | T-15D | T-15D | T-15D | |
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| | | | | | |
| | | | | | |



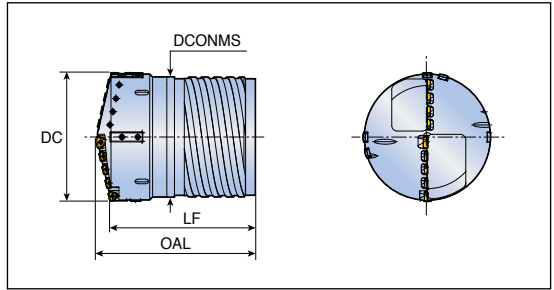
TBTA9...SE4



Single tube system



- Outer four start thread



| Designation | DC | Dimension (mm) | | | Tube | |
|------------------------------|---------------|----------------|-----|--------|----------|---------------|
| | | LF | OAL | DCONMS | Part | Diameter (mm) |
| TBTA9 - xxx.xxSE4-226 | 233.00-243.99 | 265 | 294 | 220 | BTSI 226 | 226 |
| xxx.xxSE4-238 | 244.00-255.99 | 265 | 294 | 232 | BTSI 238 | 238 |
| xxx.xxSE4-250 | 256.00-267.99 | 290 | 322 | 244 | BTSI 250 | 250 |
| xxx.xxSE4-262 | 268.00-279.99 | 290 | 323 | 256 | BTSI 262 | 262 |
| xxx.xxSE4-274 | 280.00-291.99 | 290 | 325 | 268 | BTSI 274 | 274 |

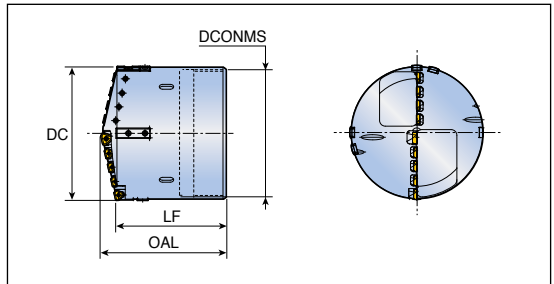
TBTA9...SI1



Single tube system



- Inner single start thread



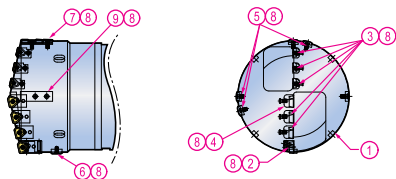
| Designation | DC | Dimension (mm) | | | Tube | |
|------------------------------|---------------|----------------|-----|--------|----------|---------------|
| | | LF | OAL | DCONMS | Part | Diameter (mm) |
| TBTA9 - xxx.xxSI1-214 | 233.00-233.99 | 190 | 217 | 211 | BTSE 214 | 214 |
| xxx.xxSI1-226 | 234.00-245.99 | 190 | 219 | 223 | BTSE 226 | 226 |
| xxx.xxSI1-238 | 246.00-257.99 | 190 | 221 | 235 | BTSE 238 | 238 |
| xxx.xxSI1-250 | 258.00-269.99 | 210 | 242 | 245 | BTSE 250 | 250 |
| xxx.xxSI1-262 | 270.00-281.99 | 210 | 244 | 259 | BTSE 262 | 262 |
| xxx.xxSI1-274 | 282.00-293.99 | 210 | 245 | 271 | BTSE 274 | 274 |

| | | |
|------------------|--------------|---------------------------|
| Assembly D113 | Tube D135 | Cutting Condition D216 |
|------------------|--------------|---------------------------|

TBTA9 Series



Assembly of TBTA9 series

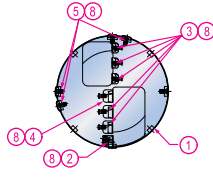
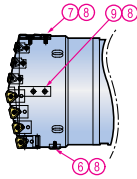


1. Head shank
2. Outer cartridge
3. Inner cartridge
4. Center cartridge
5. Guide pad
6. Sub guide pad
7. Guide pad protector
8. Lock screw
9. Filler

| Parts | | Diameter (mm) | | | | |
|-----------|---------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | 233.00-247.99 | 248.00-253.99 | 254.00-258.99 | 259.00-264.99 | 265.00-271.99 |
| Cartridge | Outer | PERC 402-43 | PERC 402-63 | PERC 402-63 | PERC 402-63 | PERC 402-63 |
| | Adjust screw | AS0005-15 | AS0006-15 | AS0006-15 | AS0006-15 | AS0006-15 |
| | Wrench | H2.5 | H3 | H3 | H3 | H3 |
| | Screw | LS1806RH | L1806RH | L1806RH | L1806RH | L1806RH |
| | Wrench | H4 | H4 | H4 | H4 | H4 |
| | Inner | CENC 402-43 | CENC 402-43 | CENC 402-43 | CENC 402-43 | CENC 402-43 |
| | Screw | LS1206 | LS1206 | LS1206 | LS1206 | LS1206 |
| | Wrench | H3L | H3L | H3L | H3L | H3L |
| | Center | CENC 402-63 | CENC 402-63 | CENC 402-63 | CENC 402-63 | CENC 402-63 |
| | Screw | LS1206S | LS1206S | LS1206S | LS1206S | LS1206S |
| Insert | Outer | TPMX 240512R-G | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G |
| | Screw | CSTB4M | CSTB5 | CSTB5 | CSTB5 | CSTB5 |
| | Wrench | T-15D | T-20D | T-20D | T-20D | T-20D |
| | Inner | TPMX 240512R-G | TPMX 240512R-G | TPMX 240512R-G | TPMX 240512R-G | TPMX 240512R-G |
| | Screw | CSTB4M | CSTB4M | CSTB4M | CSTB4M | CSTB4M |
| | Wrench | T-15D | T-15D | T-15D | T-15D | T-15D |
| | Center | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G |
| Pad | Screw | CSTB5 | CSTB5 | CSTB5 | CSTB5 | CSTB5 |
| | Wrench | T-20D | T-20D | T-20D | T-20D | T-20D |
| | Guide pad | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB | PAD-GP18-40-300-DC-SB |
| | Screw | LS1206S | LS1206S | LS1206S | LS1206S | LS1206S |
| | Wrench | H3 | H3 | H3 | H3 | H3 |
| | Guide pad protector | PAD-P18 | PAD-P18 | PAD-P18 | PAD-P18 | PAD-P18 |
| | Screw | LS1206S | LS1206S | LS1206S | LS1206S | LS1206S |
| | Wrench | H3 | H3 | H3 | H3 | H3 |
| | Sub guide pad | PAD-S14 | PAD-S14 | PAD-S14 | PAD-S14 | PAD-S14 |
| | Screw | CSTA5S | CSTA5S | CSTA5S | CSTA5S | CSTA5S |
| | Wrench | T-15D | T-15D | T-15D | T-15D | T-15D |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |



Assembly of TBTA9 series

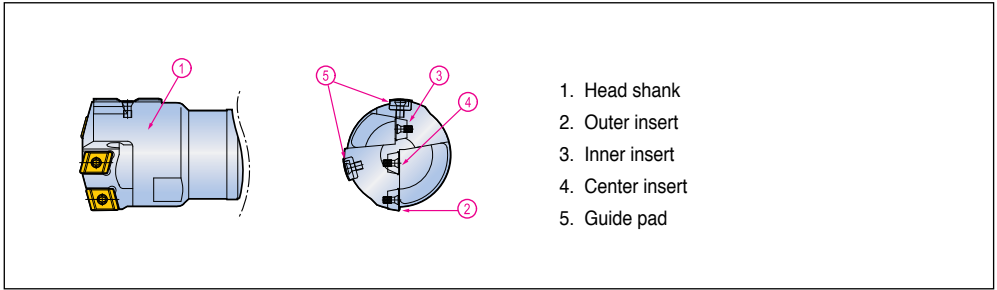


1. Head shank
2. Outer cartridge
3. Inner cartridge
4. Center cartridge
5. Guide pad
6. Sub guide pad
7. Guide pad protector
8. Lock screw
9. Filler

| Parts | | Diameter (mm) | | | |
|-----------|---------------------|--|--|--|--|
| | | 272.00-275.99 | 276.00-284.99 | 285.00-289.99 | 290.00-293.99 |
| Cartridge | Outer | PERC 402-63 | PERC 402-63 | PERC 402-63 | PERC 402-63 |
| | Adjust screw | AS0006-15 | AS0006-15 | AS0006-15 | AS0006-15 |
| | Wrench | H3 | H3 | H3 | H3 |
| | Screw | L1806RH | L1806RH | L1806RH | L1806RH |
| | Wrench | H4 | H4 | H4 | H4 |
| | Inner | CENC 402-63 | CENC 402-63 | CENC 402-63 | CENC 402-63 |
| | Screw | LS1206S | LS1206S | LS1206S | LS1206S |
| | Wrench | H3L | H3L | H3L | H3L |
| | Center | CENC 402-63 | CENC 402-63 | CENC 402-63 | CENC 402-63 |
| | Screw | LS1206S | LS1206S | LS1206S | LS1206S |
| Insert | Outer | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G |
| | Screw | CSTB5 | CSTB5 | CSTB5 | CSTB5 |
| | Wrench | T-20D | T-20D | T-20D | T-20D |
| | Inner | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G |
| | Screw | CSTB5 | CSTB5 | CSTB5 | CSTB5 |
| | Wrench | T-20D | T-20D | T-20D | T-20D |
| | Center | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G | TPMX 280716R-G |
| Pad | Screw | CSTB5 | CSTB5 | CSTB5 | CSTB5 |
| | Wrench | T-20D | T-20D | T-20D | T-20D |
| | Guide pad | PAD-GP18-40-300-DC-SB PAD-GP18-40-300-DC-SC | PAD-GP18-40-300-DC-SB PAD-GP18-40-300-DC-SC | PAD-GP18-40-300-DC-SB PAD-GP18-40-300-DC-SC | PAD-GP18-40-300-DC-SB PAD-GP18-40-300-DC-SC |
| | Screw | LS1206S | LS1206S | LS1206S | LS1206S |
| | Wrench | H3 | H3 | H3 | H3 |
| | Guide pad protector | PAD-P18 | PAD-P18 | PAD-P18 | PAD-P18 |
| | Screw | LS1206S | LS1206S | LS1206S | LS1206S |
| | Wrench | H3 | H3 | H3 | H3 |
| | Sub guide pad | PAD-S14 | PAD-S14 | PAD-S14 | PAD-S14 |
| | Screw | CSTA5S | CSTA5S | CSTA5S | CSTA5S |
| Wrench | T-15D | T-15D | T-15D | T-15D | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |



Assembly of TBTA-FB series



| Parts | | Diameter (mm) | | | |
|--------|--------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | 25.00-28.00 | 28.01-29.99 | 30.00-35.00 | 35.01-38.00 |
| Insert | PER | NPHT 060304R-G-P | NPHT 060304R-G-P | NPHT 080404R-G-P | NPHT 080404R-G-P |
| | Screw | CSTB2.2 | CSTB2.2 | SR 14-560-HG | SR 14-560-HG |
| | Wrench | T-7F | T-7F | T-8F | T-8F |
| | INT | NPMT 060304R-G-I | NPMT 060304R-G-I | NPMT 070404R-G-I | NPMT 070404R-G-I |
| | Screw | CSTB2.2 | CSTB2.2 | SR 14-560-HG | SR 14-560-HG |
| | Wrench | T-7F | T-7F | T-8F | T-8F |
| Pad | CEN | NPMT 060308L-G-C | NPMT 070408L-G-C | NPMT 070408L-G-C | NPMT 080480L-G-C |
| | Screw | CSTB2.2 | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG |
| | Wrench | T-7F | T-8F | T-8F | T-8F |
| | PAD | PAD-GP06-20-120-DC-SB | PAD-GP06-20-120-DC-SB | PAD-GP07-20-120-DC-SB | PAD-GP07-20-120-DC-SB |
| | | PAD-GP06-20-120-DC-SC | PAD-GP06-20-120-DC-SC | PAD-GP07-20-120-DC-SC | PAD-GP07-20-120-DC-SC |
| | Screw | CSTB2.2S | CSTB2.2S | CSTB3S | CSTB3S |
| | Wrench | T-7F | T-7F | T-9F | T-9F |
| | | | | | |
| | | | | | |

| Parts | | Diameter (mm) | | | |
|--------|--------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | 38.01-39.00 | 39.01-41.00 | 41.01-44.00 | 44.01-45.00 |
| Insert | PER | NPHT 090404R-G-P | NPHT 090404R-G-P | NPHT 090404R-G-P | NPHT 090404R-G-P |
| | Screw | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG |
| | Wrench | T-8F | T-8F | T-8F | T-8F |
| | INT | NPMT 070404R-G-I | NPMT 070404R-G-I | NPMT 080404R-G-I | NPMT 080404R-G-I |
| | Screw | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG |
| | Wrench | T-8F | T-8F | T-8F | T-8F |
| Pad | CEN | NPMT 080408L-G-C | NPMT 080408L-G-C | NPMT 080408L-G-C | NPMT 080480L-G-C |
| | Screw | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG |
| | Wrench | T-8F | T-8F | T-8F | T-8F |
| | PAD | PAD-GP07-20-120-DC-SB | PAD-GP08-25-155-DC-SB | PAD-GP08-25-155-DC-SB | PAD-GP08-25-155-DC-SB |
| | | PAD-GP07-20-120-DC-SC | PAD-GP08-25-155-DC-SC | PAD-GP08-25-155-DC-SC | PAD-GP08-25-155-DC-SC |
| | Screw | CSTB3S | CSTB3S | CSTB3S | CSTB3S |
| | Wrench | T-9F | T-9F | T-9F | T-9F |
| | | | | | |
| | | | | | |

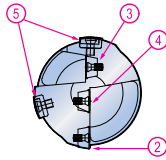
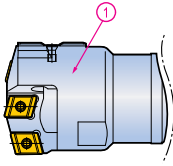


• Insert and guide pad are sold separately from drill body.

TBTA-FB Series



Assembly of TBTA-FB series



1. Head shank
2. Outer insert
3. Inner insert
4. Center insert
5. Guide pad

| Parts | | Diameter (mm) | | | |
|--------|--------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | 45.01-47.00 | 47.01-51.00 | 51.01-54.00 | 54.01-57.00 |
| Insert | PER | NPHT 090404R-G-P | NPHT 110404R-G-P | NPHT 110404R-G-P | NPHT 110404R-G-P |
| | Screw | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG |
| | Wrench | T-8F | T-8F | T-8F | T-8F |
| | INT | NPMT 080404R-G-I | NPMT 080404R-G-I | NPMT 100404R-G-I | NPMT 100404R-G-I |
| | Screw | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG |
| | Wrench | T-8F | T-8F | T-8F | T-8F |
| | CEN | NPMT 100408L-G-C | NPMT 100408L-G-C | NPMT 100408L-G-C | NPMT 130408L-G-C |
| | Screw | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG |
| Pad | Wrench | T-8F | T-8F | T-8F | T-8F |
| | | | | | |
| | PAD | PAD-GP10-30-200-DC-SB | PAD-GP10-30-200-DC-SB | PAD-GP10-30-200-DC-SB | PAD-GP10-30-200-DC-SB |
| | | PAD-GP10-30-200-DC-SC | PAD-GP10-30-200-DC-SC | PAD-GP10-30-200-DC-SC | PAD-GP10-30-200-DC-SC |
| | Screw | CSTB3.5 | CSTB3.5 | CSTB3.5 | CSTB3.5 |
| Wrench | T-10/5 | T-10/5 | T-10/5 | T-10/5 | |

| Parts | | Diameter (mm) | | |
|--------|--------|-----------------------|-----------------------|-----------------------|
| | | 57.01-60.00 | 60.01-64.00 | 64.01-65.00 |
| Insert | PER | NPHT 110404R-G-P | NPHT 130404R-G-P | NPHT 130404R-G-P |
| | Screw | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG |
| | Wrench | T-8F | T-8F | T-8F |
| | INT | NPMT 100404R-G-I | NPMT 100404R-G-I | NPMT 130404R-G-I |
| | Screw | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG |
| | Wrench | T-8F | T-8F | T-8F |
| | CEN | NPMT 130408L-G-C | NPMT 130408L-G-C | NPMT 130408L-G-C |
| | Screw | SR 14-560-HG | SR 14-560-HG | SR 14-560-HG |
| Pad | Wrench | T-8F | T-8F | T-8F |
| | | | | |
| | PAD | PAD-GP12-35-250-DC-SB | PAD-GP12-35-250-DC-SB | PAD-GP12-35-250-DC-SB |
| | | PAD-GP12-35-250-DC-SC | PAD-GP12-35-250-DC-SC | PAD-GP12-35-250-DC-SC |
| | Screw | CSTB3.5 | CSTB3.5 | CSTB3.5 |
| Wrench | T-10/5 | T-10/5 | T-10/5 | |

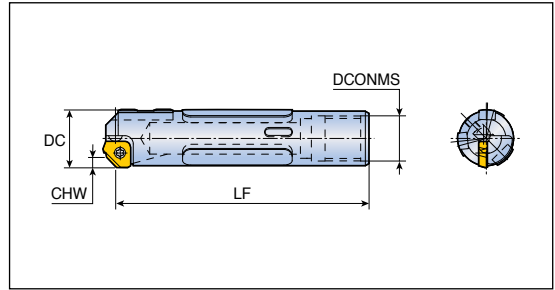


• Insert and guide pad are sold separately from drill body.

TBTA-R...S11



Single tube system



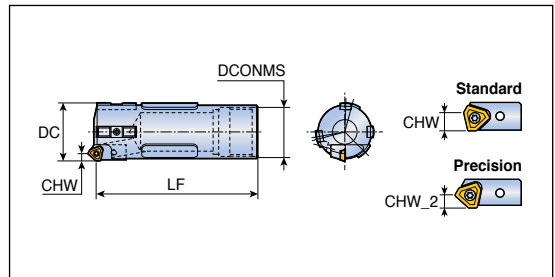
- Inner single start thread

| Designation | DC | CHW (mm) | Dimension (mm) | | Tube | |
|-----------------------------|-------------|----------|----------------|--------|----------|---------------|
| | | | LF | DCONMS | Part | Diameter (mm) |
| TBTA-R- xxx.xxS11-22 | 25.00-26.99 | 2.8 | 110.5 | 20 | BTSE 022 | 22 |
| xxx.xxS11-24 | 27.00-29.99 | 2.8 | 110.5 | 22 | BTSE 024 | 24 |
| xxx.xxS11-26 | 30.00-31.99 | 2.8 | 110.5 | 24 | BTSE 026 | 26 |
| xxx.xxS11-28 | 32.00-33.99 | 2.8 | 110.5 | 26 | BTSE 028 | 28 |
| xxx.xxS11-30 | 34.00-36.99 | 2.8 | 135.5 | 27 | BTSE 030 | 30 |
| xxx.xxS11-33 | 37.00-39.99 | 2.8 | 135.5 | 30 | BTSE 033 | 33 |

TBTA-R...S11



Single tube system



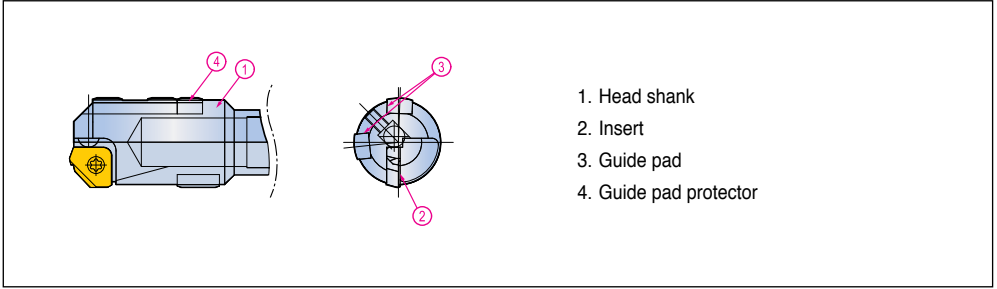
- Inner single start thread

| Designation | DC | CHW (mm) | | Dimension (mm) | | Tube | |
|-----------------------------|--------------|----------|-----------|----------------|--------|----------|---------------|
| | | Standard | Precision | LF | DCONMS | Part | Diameter (mm) |
| TBTA-R- xxx.xxS11-36 | 40.00-43.99 | 6.4 | 4 | 135 | 33 | BTSE 036 | 36 |
| xxx.xxS11-39 | 44.00-46.99 | 6.4 | 4 | 135 | 37 | BTSE 039 | 39 |
| xxx.xxS11-43 | 47.00-51.99 | 6.4 | 4 | 145 | 41 | BTSE 043 | 43 |
| xxx.xxS11-47 | 52.00-56.99 | 7.2 | 4.8 | 145 | 44 | BTSE 047 | 47 |
| xxx.xxS11-51 | 57.00-60.99 | 7.2 | 4.8 | 170 | 49 | BTSE 051 | 51 |
| xxx.xxS11-56 | 61.00-67.99 | 7.2/10.4 | 4.8/6.4 | 170 | 53 | BTSE 056 | 56 |
| xxx.xxS11-62 | 68.00-74.99 | 10.4 | 6.4 | 170 | 59 | BTSE 062 | 62 |
| xxx.xxS11-68 | 75.00-80.99 | 10.4 | 6.4 | 205 | 65 | BTSE 068 | 68 |
| xxx.xxS11-75 | 81.00-90.99 | 10.4 | 6.4 | 215 | 71 | BTSE 075 | 75 |
| xxx.xxS11-82 | 91.00-98.99 | 10.4 | 6.4 | 225 | 79 | BTSE 082 | 82 |
| xxx.xxS11-94 | 99.00-110.99 | 10.4 | 6.4 | 235 | 90 | BTSE 094 | 94 |

| | | |
|----------------------|------------------|-------------------------------|
| Assembly D124 | Tube D135 | Cutting Condition D216 |
|----------------------|------------------|-------------------------------|



Assembly of TBTA-R series



1. Head shank
2. Insert
3. Guide pad
4. Guide pad protector

| Parts | | Diameter (mm) | | | | |
|------------------|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|---------------|
| | | 25.00-27.99 | 28.00-29.99 | 30.00-37.99 | 38.00-39.99 | |
| Close tolerance | Cartridge | Adjust ball | BALL5 | BALL5 | BALL5 | BALL5 |
| | | Adjust screw | AS0005-5 | AS0005-5 | AS0005-5 | AS0005-5 |
| | | Wrench | H2.5 | H2.5 | H2.5 | H2.5 |
| | Insert | Screw | - | - | - | - |
| | | Wrench | - | - | - | - |
| | | Insert | XPMT 16002-45 | XPMT 16002-45 | XPMT 16002-45 | XPMT 16002-45 |
| | | Screw | CSTANO3 | CSTANO3 | CSTANO3 | CSTANO3 |
| Normal tolerance | Cartridge | Wrench | T-9D | T-9D | T-9D | T-9D |
| | | Outer | - | - | - | - |
| | | Adjust screw | - | - | - | - |
| | | Wrench | - | - | - | - |
| | | Screw | - | - | - | - |
| | Insert | Wrench | - | - | - | - |
| | | Insert | XPMT 16002-45 | XPMT 16002-45 | XPMT 16002-45 | XPMT 16002-45 |
| Pad | Guide pad (A) | PAD-GP06-20-120-DC-SB | PAD-GP06-20-120-DC-SB | PAD-GP07-20-120-DC-SB | PAD-GP08-25-155-DC-SB | |
| | | PAD-GP06-20-120-DC-SC | PAD-GP06-20-120-DC-SC | PAD-GP07-20-120-DC-SC | PAD-GP08-25-155-DC-SC | |
| | Screw | CSTB2.2S | CSTB2.2S | CSTB3S | CSTB3S | |
| | Wrench | T-9D | T-9D | T-9D | T-9D | |
| | Guide pad protector (B) | PAD-P08-120 | PAD-P08-120 | PAD-P08-140 | PAD-P08 | |
| | | Screw | CSTB3S | CSTB3S | CSTB3S | CSTB3S |
| | Wrench | T-9D | T-9D | T-9D | T-9D | |
| | Resin guide pad (C) | PAD-R10 | PAD-R10 | PAD-R12 | PAD-R15 | |
| | | Screw | LS0902, 5-6 | LS0902, 5-6 | LS0903-8 | LS0904-10 |
| | Wrench | - | - | H2 | H2.5 | |
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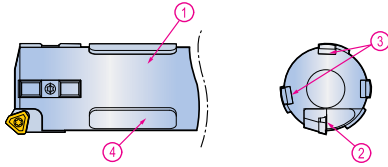


- A + B is for outer four start thread connection type
- A + C is for inner single start thread connection type

TBTA-R Series



Assembly of TBTA-R series



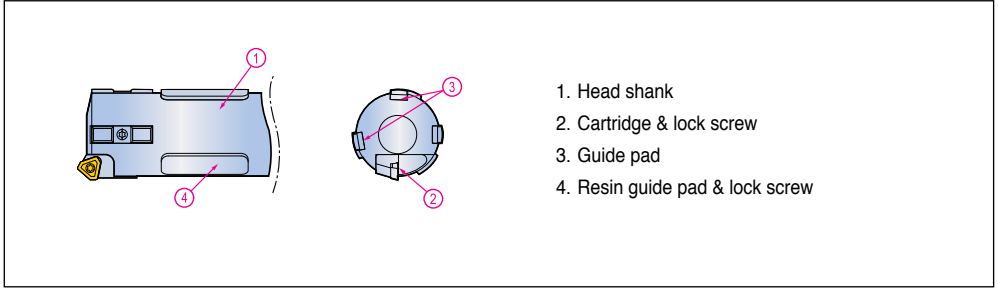
1. Head shank
2. Cartridge & lock screw
3. Guide pad
4. Resin guide pad & lock screw

| Parts | | Diameter (mm) | | | | |
|------------------|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------|
| | | 40.00-45.99 | 46.00-51.99 | 52.00-56.99 | 57.00-59.99 | |
| Close tolerance | Cartridge | Outer | PERC-P 04R | PERC-P 04R | PERC-P 32R | PERC-P 32R |
| | | Adjust screw | AS0004-8 | AS0004-8 | AS0005-10 | AS0005-10 |
| | | Wrench | H2 | H2 | H2.5 | H2.5 |
| | Insert | Screw | LS1803.5RH | LS1803.5RH | LS1805RH | LS1805RH |
| | | Wrench | H2.5 | H2.5 | H3 | H3 |
| | | Wrench | T-8D | T-8D | T-8D | T-8D |
| Normal tolerance | Cartridge | Outer | PERC 402-04 | PERC 402-04 | PERC 402-32 | PERC 402-32 |
| | | Adjust screw | AS0004-8 | AS0004-8 | AS0005-10 | AS0005-10 |
| | | Wrench | H2 | H2 | H2.5 | H2.5 |
| | Insert | Screw | LS1803.5RH | LS1803.5RH | LS1805RH | LS1805RH |
| | | Wrench | H2.5 | H2.5 | H3 | H3 |
| | | Wrench | T-8D | T-8D | T-8D | T-8D |
| Pad | Guide pad (A) | PAD-GP08-25-155-DC-SB | PAD-GP10-30-200-DC-SB | PAD-GP10-30-200-DC-SB | PAD-GP14-40-250-DC-SB | |
| | | PAD-GP08-25-155-DC-SC | PAD-GP10-30-200-DC-SC | PAD-GP10-30-200-DC-SC | PAD-GP14-40-250-DC-SC | |
| | Screw | CSTB3S | CSTB3.5 | CSTB3.5 | CSTB3.5 | |
| | Wrench | T-9D | T-15D | T-15D | T-15D | |
| | Guide pad protector (B) | PAD-P08 | PAD-P10 | PAD-P10 | PAD-P14 | |
| | | Screw | CSTB3S | CSTB4S | CSTB4S | CSTB4S |
| | Wrench | T-9D | T-15D | T-15D | T-15D | |
| | Resin guide pad (C) | PAD-R15 | PAD-R15 | PAD-R15 | PAD-R20 | |
| | | Screw | LS0904-10 | LS0904-10 | LS0904-10 | LS0905-12 |
| | Wrench | H2.5 | H2.5 | H2.5 | H3 | |
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- A + B is for outer four start thread connection type
- A + C is for inner single start thread connection type

Assembly of TBTA-R series



1. Head shank
2. Cartridge & lock screw
3. Guide pad
4. Resin guide pad & lock screw

| Parts | | Diameter (mm) | | | | |
|------------------|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------|
| | | 60.00-80.99 | 81.00-90.99 | 91.00-99.99 | 100.00-122.99 | |
| Close tolerance | Cartridge | Outer | PERC-P 43R | PERC-P 43R | PERC-P 43R | PERC-P 43R |
| | | Adjust screw | AS0005-15 | AS0005-15 | AS0005-15 | AS0005-15 |
| | | Wrench | H2.5 | H2.5 | H2.5 | H2.5 |
| | | Screw | LS1806RH | LS1806RH | LS1806RH | LS1806RH |
| | Insert | Wrench | H4 | H4 | H4 | H4 |
| | | Insert | TPMX 2405LG | TPMX 2405LG | TPMX 2405LG | TPMX 2405LG |
| | | Screw | CSTB4M | CSTB4M | CSTB4M | CSTB4M |
| Normal tolerance | Cartridge | Wrench | T-15D | T-15D | T-15D | T-15D |
| | | Outer | PERC 402-43 | PERC 402-43 | PERC 402-43 | PERC 402-43 |
| | | Adjust screw | AS0005-15 | AS0005-15 | AS0005-15 | AS0005-15 |
| | | Wrench | H2.5 | H2.5 | H2.5 | H2.5 |
| | Insert | Screw | LS1806RH | LS1806RH | LS1806RH | LS1806RH |
| | | Wrench | H4 | H4 | H4 | H4 |
| | | Insert | TPMX 240512R-G | TPMX 170408R-G | TPMX 170408R-G | TPMX 170408R-G |
| | | Screw | CSTB4M | CSTB4M | CSTB4M | CSTB4M |
| | | Wrench | T-15D | T-15D | T-15D | T-15D |
| | | Wrench | T-15D | T-15D | T-15D | T-15D |
| Pad | Guide pad (A) | PAD-GP14-40-250-DC-SB | PAD-GP14-40-250-DC-SB | PAD-GP14-40-250-DC-SB | PAD-GP18-40-300-DC-SB | |
| | | PAD-GP14-40-250-DC-SC | PAD-GP14-40-250-DC-SC | PAD-GP14-40-250-DC-SC | PAD-GP18-40-300-DC-SC | |
| | Screw | CSTA5S | CSTA5S | CSTA5S | LS1206S | |
| | Wrench | T-15D | T-15D | T-15D | H3 | |
| | Guide pad protector (B) | PAD-P14 | PAD-P14 | PAD-P14 | PAD-P18 | |
| | | Screw | CSTA5S | CSTA5S | CSTA5S | LS1206S |
| | Wrench | T-15D | T-15D | T-15D | H3 | |
| | Resin guide pad (C) | PAD-R20 | PAD-R30 | PAD-R35 | PAD-R35 | |
| | | Screw | LS0905-12 | LS0906-15 | LS0906-15 | LS0906-15 |
| | Wrench | H3 | H4 | H4 | H4 | |
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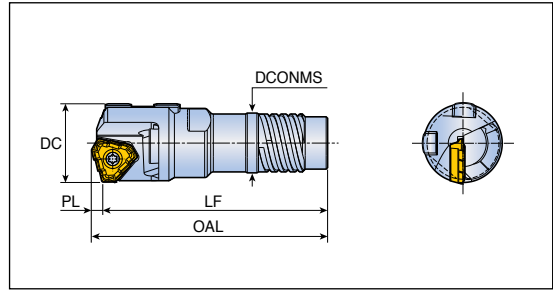


- A + B is for outer four start thread connection type
- A + C is for inner single start thread connection type

TBTA-TR...SE4



Single tube system



- Outer four start thread

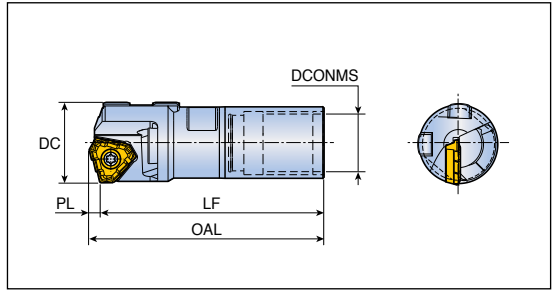
| Designation | DC | Dimension (mm) | | | | Tube | |
|----------------------------|-------------|----------------|------|--------|-----|----------|---------------|
| | | LF | OAL | DCONMS | PL | Part | Diameter (mm) |
| TBTA- TRxx.xxSE4-14 | 16.00-16.70 | 55.0 | 57.2 | 12.6 | 2.2 | BTSI 014 | 14 |
| TRxx.xxSE4-15 | 16.71-17.70 | 55.0 | 57.2 | 13.6 | 2.2 | BTSI 015 | 15 |
| TRxx.xxSE4-16 | 17.71-18.90 | 56.0 | 59.0 | 14.5 | 3.0 | BTSI 016 | 16 |
| TRxx.xxSE4-17 | 18.91-20.00 | 56.0 | 59.0 | 15.5 | 3.0 | BTSI 017 | 17 |
| TRxx.xxSE4-18 | 20.01-21.80 | 60.0 | 63.2 | 16.0 | 3.2 | BTSI 018 | 18 |
| TRxx.xxSE4-20 | 21.81-21.99 | 63.5 | 66.7 | 18.0 | 3.2 | BTSI 020 | 20 |
| TRxx.xxSE4-20 | 22.00-24.10 | 65.5 | 68.9 | 18.0 | 3.4 | BTSI 020 | 20 |
| TRxx.xxSE4-22 | 24.11-26.40 | 65.5 | 69.1 | 19.5 | 3.6 | BTSI 022 | 22 |
| TRxx.xxSE4-24 | 26.41-28.00 | 65.6 | 69.1 | 21.0 | 3.6 | BTSI 024 | 24 |
| TRxx.xxSE4-24 | 28.01-28.70 | 70.0 | 74.6 | 21.0 | 4.6 | BTSI 024 | 24 |
| TRxx.xxSE4-26 | 28.71-29.99 | 75.0 | 79.6 | 23.5 | 4.6 | BTSI 026 | 26 |
| TRxx.xxSE4-26 | 30.00-31.00 | 75.0 | 79.6 | 23.5 | 4.6 | BTSI 026 | 26 |
| TRxx.xxSE4-28 | 31.01-32.00 | 75.0 | 79.6 | 25.5 | 4.6 | BTSI 028 | 28 |
| TRxx.xxSE4-28 | 32.01-33.30 | 74.5 | 79.9 | 25.5 | 5.4 | BTSI 028 | 28 |
| TRxx.xxSE4-30 | 33.31-36.20 | 79.5 | 84.9 | 28.0 | 5.4 | BTSI 030 | 30 |
| TRxx.xxSE4-33 | 36.21-39.00 | 89.5 | 94.9 | 30.0 | 5.4 | BTSI 033 | 33 |
| TRxx.xxSE4-33 | 39.01-39.60 | 89.5 | 94.9 | 30.0 | 5.4 | BTSI 033 | 33 |
| TRxx.xxSE4-36 | 39.61-40.00 | 94.5 | 99.9 | 33.0 | 5.4 | BTSI 036 | 36 |
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| Assembly D130 | Tube D135 | Cutting Condition D222 |
|------------------|--------------|---------------------------|

- Insert and guide pad are sold separately from drill body.



Single tube system



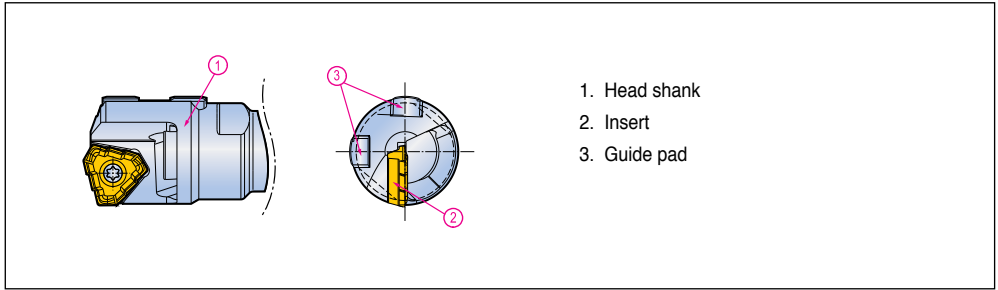
- Inner single start thread

| Designation | DC | Dimension (mm) | | | | Tube | |
|-----------------------------|-------------|----------------|-------|--------|-----|------------|---------------|
| | | LF | OAL | DCONMS | PL | Part | Diameter (mm) |
| TBTA- TR16.00SI1-13A | 16.00 | 53.5 | 55.7 | 10.8 | 2.2 | BTSE 013A | 13 |
| TRxx.xxSI1-13B | 16.01-16.50 | 53.5 | 55.7 | 11.1 | 2.2 | BTSE 013B | 13 |
| TRxx.xxSI1-14A | 16.51-17.25 | 53.5 | 55.7 | 11.8 | 2.2 | BTSE 014A | 14 |
| TRxx.xxSI1-14B | 17.26-18.00 | 53.5 | 55.7 | 12.1 | 2.2 | BTSE 014B | 14 |
| TRxx.xxSI1-15 | 18.01-19.00 | 53.5 | 56.5 | 12.8 | 3.0 | BTSE 015 | 15 |
| TRxx.xxSI1-16.5 | 19.01-19.99 | 53.5 | 56.7 | 13.8 | 3.2 | BTSE 016.5 | 16.5 |
| TRxx.xxSI1-18 | 20.00-21.99 | 58.0 | 61.2 | 14.5 | 3.2 | BTSE 018 | 18 |
| TRxx.xxSI1-20 | 22.00-24.99 | 60.0 | 63.4 | 16.0 | 3.4 | BTSE 020 | 20 |
| TRxx.xxSI1-22 | 25.00-25.99 | 60.0 | 63.5 | 17.0 | 3.5 | BTSE 022 | 22 |
| TRxx.xxSI1-22 | 26.00-26.99 | 65.0 | 68.5 | 17.0 | 3.5 | BTSE 022 | 22 |
| TRxx.xxSI1-24 | 27.00-28.00 | 65.0 | 68.5 | 19.0 | 3.5 | BTSE 024 | 24 |
| TRxx.xxSI1-24 | 28.01-29.99 | 70.0 | 74.6 | 22.0 | 4.6 | BTSE 024 | 24 |
| TRxx.xxSI1-26 | 30.00-31.99 | 75.0 | 79.6 | 24.0 | 4.6 | BTSE 026 | 26 |
| TRxx.xxSI1-28 | 32.00 | 75.0 | 79.6 | 26.0 | 4.6 | BTSE 028 | 28 |
| TRxx.xxSI1-28 | 32.01-33.99 | 74.5 | 79.9 | 26.0 | 5.4 | BTSE 028 | 28 |
| TRxx.xxSI1-30 | 34.00-36.99 | 89.5 | 94.9 | 27.0 | 5.4 | BTSE 030 | 30 |
| TRxx.xxSI1-33 | 37.00-39.00 | 94.5 | 99.9 | 30.0 | 5.4 | BTSE 033 | 33 |
| TRxx.xxSI1-33 | 39.01-39.99 | 94.5 | 99.9 | 30.0 | 5.4 | BTSE 033 | 33 |
| TRxx.xxSI1-36 | 40.00 | 99.5 | 104.9 | 33.0 | 5.4 | BTSE 036 | 36 |
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• Insert and guide pad are sold separately from drill body.

| | | |
|----------------------|------------------|-------------------------------|
| Assembly D130 | Tube D135 | Cutting Condition D222 |
|----------------------|------------------|-------------------------------|

Assembly of TBTA-TR series



1. Head shank
2. Insert
3. Guide pad

| Parts | | Diameter (mm) | | |
|-----------|-----------|-----------------------|-----------------------|-----------------------|
| | | 16.00-18.00 | 18.01-20.00 | 20.01-21.00 |
| Insert | Insert | TOGT 080305 RS | TOGT 090305 RS | TOGT 100305 RS |
| | Screw | SR 14-560/S | CSTB2.5S* | CSTB3S* |
| | Wrench | T-8F | T-8F | T-9F |
| Guide Pad | Guide Pad | PAD-GP05-18-075-DC-SB | PAD-GP06-20-085-DC-SB | PAD-GP06-20-085-DC-SB |
| | | PAD-GP05-18-075-DC-SC | PAD-GP06-20-085-DC-SC | PAD-GP06-20-085-DC-SC |
| | Screw | SR 34-508 | CSTB2.2S* | CSTB2.2S* |
| | Wrench | T-7F | T-7F | T-7F |

| Parts | | Diameter (mm) | | |
|-----------|-----------|-----------------------|-----------------------|-----------------------|
| | | 21.01-21.99 | 22.00-25.00 | 25.01-28.00 |
| Insert | Insert | TOGT 100305 RS | TOGT 110405 RS | TOGT 120405 RS |
| | Screw | CSTB3S* | CSTB3.5H* | CSTB4S* |
| | Wrench | T-9F | T-15F | T-15F |
| Guide Pad | Guide Pad | PAD-GP06-20-100-DC-SB | PAD-GP06-20-100-DC-SB | PAD-GP06-20-120-DC-SB |
| | | PAD-GP06-20-100-DC-SC | PAD-GP06-20-100-DC-SC | PAD-GP06-20-120-DC-SC |
| | Screw | CSTB2.2S* | CSTB2.2S* | CSTB2.2S* |
| | Wrench | T-7F | T-7F | T-7F |

| Parts | | Diameter (mm) | | | |
|-----------|-----------|-----------------------|-----------------------|-----------------------|-----------------------|
| | | 28.01-29.99 | 30.00-32.00 | 32.01-39.00 | 39.01-40.00 |
| Insert | Insert | TOGT 130408 RS | TOGT 130408 RS | TOGT 140510 RS | TOGT 140510 RS |
| | Screw | SR 16-212/L10 | SR 16-212/L10 | SR 16-212/L10 | SR 16-212/L10 |
| | Wrench | T-20/5 | T-20/5 | T-20/5 | T-20/5 |
| Guide Pad | Guide Pad | PAD-GP06-20-120-DC-SB | PAD-GP07-20-120-DC-SB | PAD-GP07-20-120-DC-SB | PAD-GP08-25-155-DC-SB |
| | | PAD-GP06-20-120-DC-SC | PAD-GP07-20-120-DC-SC | PAD-GP07-20-120-DC-SC | PAD-GP08-25-155-DC-SC |
| | Screw | SR 34-508 | CSTB-3L065 | CSTB-3S | CSTB-3S |
| | Wrench | T-7F | T-9F | T-9F | T-9F |

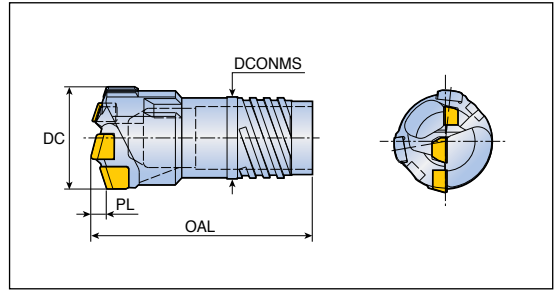
* Insert and guide pad are sold separately from drill body.



BTA...SE2/SE4



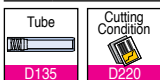
Single tube system



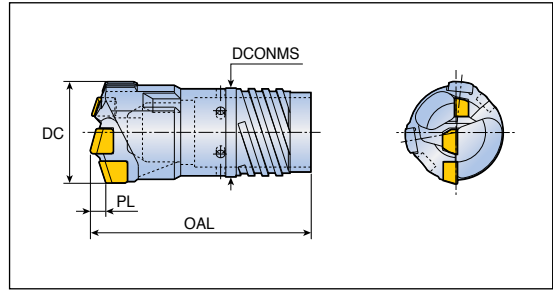
- Outer four start thread

| Designation | DC | Dimension (mm) | | | Tube | |
|---------------------------|-------------|----------------|-----|--------|---------|---------------|
| | | OAL | PL | DCONMS | Part | Diameter (mm) |
| BTA xxx.xx SE2-11* | 12.60-13.10 | 43.0 | 1.1 | 9.6 | BTSI011 | 11 |
| xxx.xx SE2-11* | 13.11-13.60 | 43.0 | 1.1 | 9.6 | BTSI011 | 11 |
| xxx.xx SE2-12* | 13.61-14.10 | 43.0 | 1.2 | 10.6 | BTSI012 | 12 |
| xxx.xx SE2-12* | 14.11-14.60 | 43.0 | 1.2 | 10.6 | BTSI012 | 12 |
| xxx.xx SE2-13* | 14.61-15.10 | 43.0 | 1.3 | 11.6 | BTSI013 | 13 |
| xxx.xx SE2-13* | 15.11-15.59 | 43.0 | 1.3 | 11.6 | BTSI013 | 13 |
| xxx.xx SE4-14 | 15.60-16.20 | 43.0 | 2.7 | 12.6 | BTSI014 | 14 |
| xxx.xx SE4-14 | 16.21-16.70 | 43.0 | 2.7 | 12.6 | BTSI014 | 14 |
| xxx.xx SE4-15 | 16.71-17.20 | 43.0 | 2.7 | 13.6 | BTSI015 | 15 |
| xxx.xx SE4-15 | 17.21-17.70 | 43.0 | 2.7 | 13.6 | BTSI015 | 15 |
| xxx.xx SE4-16 | 17.71-18.40 | 47.0 | 2.8 | 14.5 | BTSI016 | 16 |
| xxx.xx SE4-16 | 18.41-18.90 | 47.0 | 2.9 | 14.5 | BTSI016 | 16 |
| xxx.xx SE4-17 | 18.91-19.20 | 47.0 | 2.9 | 15.5 | BTSI017 | 17 |
| xxx.xx SE4-17 | 19.21-20.00 | 47.0 | 2.9 | 15.5 | BTSI017 | 17 |
| xxx.xx SE4-18 | 20.01-20.90 | 52.5 | 3.2 | 16.0 | BTSI018 | 18 |
| xxx.xx SE4-18 | 20.91-21.80 | 52.5 | 3.2 | 16.0 | BTSI018 | 18 |
| xxx.xx SE4-20 | 21.81-22.90 | 56.0 | 3.2 | 18.0 | BTSI020 | 20 |
| xxx.xx SE4-20 | 22.91-24.10 | 56.0 | 3.2 | 18.0 | BTSI020 | 20 |
| xxx.xx SE4-22 | 24.11-25.20 | 57.5 | 3.5 | 19.5 | BTSI022 | 22 |
| xxx.xx SE4-22 | 25.21-26.40 | 57.5 | 3.5 | 19.5 | BTSI022 | 22 |
| xxx.xx SE4-24 | 26.41-27.50 | 57.5 | 3.7 | 21.0 | BTSI024 | 24 |
| xxx.xx SE4-24 | 27.51-28.70 | 57.5 | 3.7 | 21.0 | BTSI024 | 24 |
| xxx.xx SE4-26 | 28.71-29.80 | 63.5 | 4.0 | 23.5 | BTSI026 | 26 |
| xxx.xx SE4-26 | 29.81-31.00 | 63.5 | 4.0 | 23.5 | BTSI026 | 26 |
| xxx.xx SE4-28 | 31.01-32.10 | 63.5 | 4.3 | 25.5 | BTSI028 | 28 |
| xxx.xx SE4-28 | 32.11-33.30 | 63.5 | 4.3 | 25.5 | BTSI028 | 28 |
| xxx.xx SE4-30 | 33.31-34.80 | 63.5 | 4.5 | 28.0 | BTSI030 | 30 |
| xxx.xx SE4-30 | 34.81-36.20 | 63.5 | 4.5 | 28.0 | BTSI030 | 30 |
| xxx.xx SE4-33 | 36.21-37.30 | 73.5 | 4.8 | 30.0 | BTSI033 | 33 |
| xxx.xx SE4-33 | 37.31-38.40 | 73.5 | 4.8 | 30.0 | BTSI033 | 33 |
| xxx.xx SE4-33 | 38.41-39.60 | 73.5 | 4.8 | 30.0 | BTSI033 | 33 |
| xxx.xx SE4-36 | 39.61-40.60 | 73.5 | 5.6 | 33.0 | BTSI036 | 36 |
| xxx.xx SE4-36 | 40.61-41.80 | 73.5 | 5.6 | 33.0 | BTSI036 | 36 |
| xxx.xx SE4-36 | 41.81-43.00 | 73.5 | 5.6 | 33.0 | BTSI036 | 36 |
| xxx.xx SE4-39 | 43.01-44.30 | 75.0 | 5.4 | 36.0 | BTSI039 | 39 |

- *1' 2 cutting edge head, 2 start thread

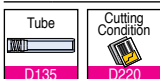


Double tube system



- Outer four start thread

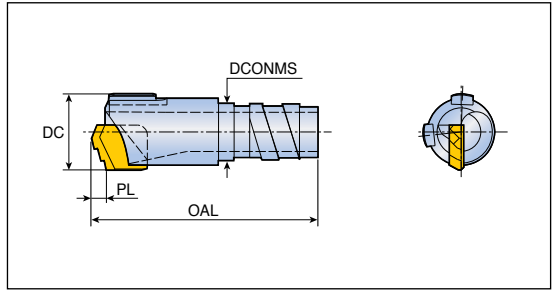
| Designation | DC | Dimension (mm) | | | Tube | | |
|--------------------------|-------------|----------------|-----|--------|------------|------------|---------------|
| | | OAL | PL | DCONMS | Outer tube | Inner tube | Diameter (mm) |
| BTA xxx.xx DE4-18 | 18.41-19.20 | 50.0 | 2.9 | 16.0 | BTDO018 | BTDI012 | 18.0 |
| xxx.xx DE4-18 | 19.21-20.00 | 50.0 | 2.9 | 16.0 | BTDO018 | BTDI012 | 18.0 |
| xxx.xx DE4-19.5 | 20.01-20.90 | 56.0 | 3.2 | 18.0 | BTDO019.5 | BTDI014 | 19.5 |
| xxx.xx DE4-19.5 | 20.91-21.80 | 56.0 | 3.2 | 18.0 | BTDO019.5 | BTDI014 | 19.5 |
| xxx.xx DE4-21.5 | 21.81-22.90 | 56.0 | 3.2 | 19.5 | BTDO021.5 | BTDI015 | 21.5 |
| xxx.xx DE4-21.5 | 22.91-24.10 | 56.0 | 3.2 | 19.5 | BTDO021.5 | BTDI015 | 21.5 |
| xxx.xx DE4-23.5 | 24.11-25.20 | 57.5 | 3.5 | 21.0 | BTDO023.5 | BTDI016 | 23.5 |
| xxx.xx DE4-23.5 | 25.21-26.40 | 57.5 | 3.5 | 21.0 | BTDO023.5 | BTDI016 | 23.5 |
| xxx.xx DE4-26 | 26.41-27.50 | 60.5 | 3.7 | 23.5 | BTDO026 | BTDI018 | 26.0 |
| xxx.xx DE4-26 | 27.51-28.70 | 60.5 | 3.7 | 23.5 | BTDO026 | BTDI018 | 26.0 |
| xxx.xx DE4-28 | 28.71-29.80 | 63.5 | 4.0 | 25.5 | BTDO028 | BTDI020 | 28.0 |
| xxx.xx DE4-28 | 29.81-31.00 | 63.5 | 4.0 | 25.5 | BTDO028 | BTDI020 | 28.0 |
| xxx.xx DE4-30.5 | 31.01-32.10 | 63.5 | 4.1 | 28.0 | BTDO030.5 | BTDI022 | 30.5 |
| xxx.xx DE4-30.5 | 32.11-33.30 | 63.5 | 4.1 | 28.0 | BTDO030.5 | BTDI022 | 30.5 |
| xxx.xx DE4-33 | 33.31-34.80 | 70.5 | 4.5 | 30.0 | BTDO033.0 | BTDI024 | 33.0 |
| xxx.xx DE4-33 | 34.81-36.20 | 70.5 | 4.5 | 30.0 | BTDO033.0 | BTDI024 | 33.0 |
| xxx.xx DE4-35.5 | 36.21-37.30 | 73.5 | 4.8 | 33.0 | BTDO035.5 | BTDI026 | 35.5 |
| xxx.xx DE4-35.5 | 37.31-38.40 | 73.5 | 4.8 | 33.0 | BTDO035.5 | BTDI026 | 35.5 |
| xxx.xx DE4-35.5 | 38.41-39.60 | 73.5 | 4.8 | 33.0 | BTDO035.5 | BTDI026 | 35.5 |
| xxx.xx DE4-39 | 39.61-40.60 | 73.5 | 5.3 | 36.0 | BTDO039 | BTDI029 | 39.0 |
| xxx.xx DE4-39 | 40.61-41.80 | 73.5 | 5.3 | 36.0 | BTDO039 | BTDI029 | 39.0 |
| xxx.xx DE4-39 | 41.81-43.00 | 73.5 | 5.3 | 36.0 | BTDO039 | BTDI029 | 39.0 |
| xxx.xx DE4-42.5 | 43.01-44.30 | 75.0 | 5.5 | 39.0 | BTDO042.5 | BTDI032 | 42.5 |
| xxx.xx DE4-42.5 | 44.31-45.60 | 75.0 | 5.5 | 39.0 | BTDO042.5 | BTDI032 | 42.5 |
| xxx.xx DE4-42.5 | 45.61-47.00 | 75.0 | 5.5 | 39.0 | BTDO042.5 | BTDI032 | 42.5 |
| xxx.xx DE4-46.5 | 47.01-48.50 | 79.0 | 6.1 | 43.0 | BTDO046.5 | BTDI035 | 46.5 |
| xxx.xx DE4-46.5 | 48.51-50.10 | 79.0 | 6.1 | 43.0 | BTDO046.5 | BTDI035 | 46.5 |
| xxx.xx DE4-46.5 | 50.11-51.70 | 79.0 | 6.1 | 43.0 | BTDO046.5 | BTDI035 | 46.5 |
| xxx.xx DE4-51 | 51.71-53.20 | 82.0 | 6.5 | 47.0 | BTDO051 | BTDI039 | 51.0 |
| xxx.xx DE4-51 | 53.21-54.70 | 82.0 | 6.5 | 47.0 | BTDO051 | BTDI039 | 51.0 |
| xxx.xx DE4-51 | 54.71-56.20 | 82.0 | 6.5 | 47.0 | BTDO051 | BTDI039 | 51.0 |
| xxx.xx DE4-55.5 | 56.21-58.40 | 84.0 | 6.6 | 51.0 | BTDO055.5 | BTDI043A | 55.5 |
| xxx.xx DE4-55.5 | 58.41-60.60 | 84.0 | 6.6 | 51.0 | BTDO055.5 | BTDI043A | 55.5 |
| xxx.xx DE4-55.5 | 60.61-62.80 | 84.0 | 6.6 | 51.0 | BTDO055.5 | BTDI043A | 55.5 |
| xxx.xx DE4-55.5 | 62.81-65.00 | 84.0 | 6.6 | 51.0 | BTDO055.5 | BTDI043A | 55.5 |



BTS...SE1



Single tube system



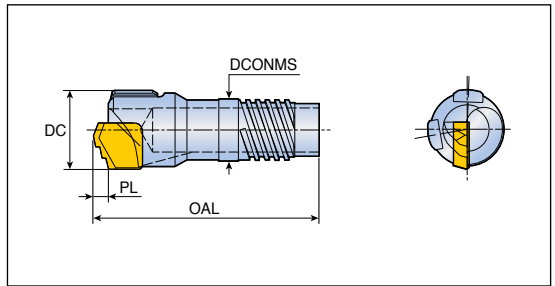
- Outer single start thread

| Designation | DC | Dimension (mm) | | | Tube | |
|---------------------------|-------------|----------------|-----|--------|---------|---------------|
| | | OAL | PL | DCONMS | Part | Diameter (mm) |
| BTS xxx.xx SE1-7.1 | 8.00-8.99 | 34 | 2.0 | 6.0 | BTSO071 | 7.1 |
| xxx.xx SE1-8.3 | 9.00-9.99 | 34 | 2.0 | 7.2 | BTSO083 | 8.3 |
| xxx.xx SE1-9 | 10.00-10.99 | 34 | 2.2 | 7.6 | BTSO090 | 9.0 |
| xxx.xx SE1-10 | 11.00-11.99 | 34 | 2.2 | 8.6 | BTSO100 | 10.0 |
| xxx.xx SE1-11 | 12.00-13.49 | 34 | 2.3 | 9.1 | BTSO110 | 11.0 |
| xxx.xx SE1-12 | 13.50-14.79 | 34 | 2.4 | 10.8 | BTSO120 | 12.0 |

BTS...SE2/SE4



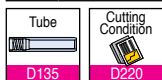
Single tube system



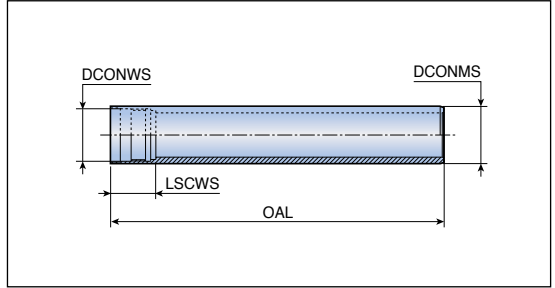
- Outer four start thread

| Designation | DC | Dimension (mm) | | | Tube | |
|---------------------------|-------------|----------------|-----|--------|---------|---------------|
| | | OAL | PL | DCONMS | Part | Diameter (mm) |
| BTS xxx.xx SE2-11* | 12.60-13.60 | 40 | 2.3 | 9.6 | BTSI011 | 11 |
| xxx.xx SE2-12* | 13.61-14.60 | 40 | 2.4 | 10.6 | BTSI012 | 12 |
| xxx.xx SE2-13* | 14.61-15.59 | 40 | 3.0 | 11.6 | BTSI013 | 13 |
| xxx.xx SE4-14 | 15.60-16.70 | 40 | 2.4 | 12.6 | BTSI014 | 14 |
| xxx.xx SE4-15 | 16.71-17.70 | 40 | 3.0 | 13.6 | BTSI015 | 15 |
| xxx.xx SE4-16 | 17.71-18.90 | 40 | 3.3 | 14.5 | BTSI016 | 16 |
| xxx.xx SE4-17 | 18.91-20.00 | 40 | 3.3 | 15.5 | BTSI017 | 17 |

- '*1' Designates outer two start thread



Single tube

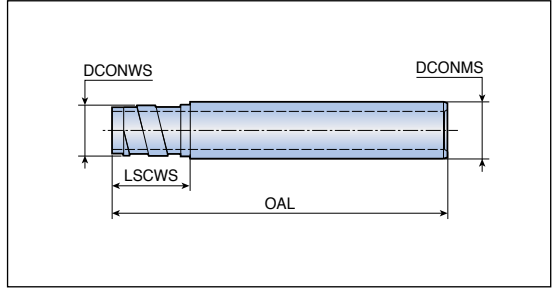


- Inner four start thread

| Designation | DC | Dimension (mm) | | |
|-----------------|---------------|----------------|--------|-------|
| | | DCONMS | DCONWS | LSCWS |
| BTSI 051 | 56.21-60.60 | 51.0 | 47.0 | 44 |
| 056A | 60.61-65.00 | 56.0 | 51.0 | 44 |
| 056B | 65.00-66.99 | 56.0 | 52.0 | 75 |
| 062 | 67.00-72.99 | 62.0 | 58.0 | 75 |
| 068 | 73.00-79.99 | 68.0 | 63.0 | 75 |
| 075 | 80.00-86.99 | 75.0 | 70.0 | 97 |
| 082 | 87.00-99.99 | 82.0 | 77.0 | 97 |
| 094 | 100.00-111.99 | 94.0 | 89.0 | 97 |
| 106 | 112.00-123.99 | 106.0 | 101.0 | 118 |
| 118 | 124.00-135.99 | 118.0 | 113.0 | 118 |
| 130 | 136.00-147.99 | 130.0 | 125.0 | 118 |
| 142 | 148.00-159.99 | 142.0 | 137.0 | 139 |
| 154 | 160.00-171.99 | 154.0 | 149.0 | 139 |
| 166 | 172.00-183.99 | 166.0 | 161.0 | 139 |
| 178 | 184.00-195.99 | 178.0 | 173.0 | 144 |
| 190 | 196.00-207.99 | 190.0 | 185.0 | 144 |
| 202 | 208.00-219.99 | 202.0 | 197.0 | 144 |
| 214 | 220.00-231.99 | 214.0 | 208.0 | 164 |
| 226 | 232.00-243.99 | 226.0 | 220.0 | 164 |
| 238 | 244.00-255.99 | 238.0 | 232.0 | 164 |
| 250 | 256.00-267.99 | 250.0 | 244.0 | 184 |
| 262 | 268.00-279.99 | 262.0 | 256.0 | 184 |
| 274 | 280.00-291.99 | 274.0 | 268.0 | 184 |
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- Please indicate overall length (OAL) when ordering

Single tube

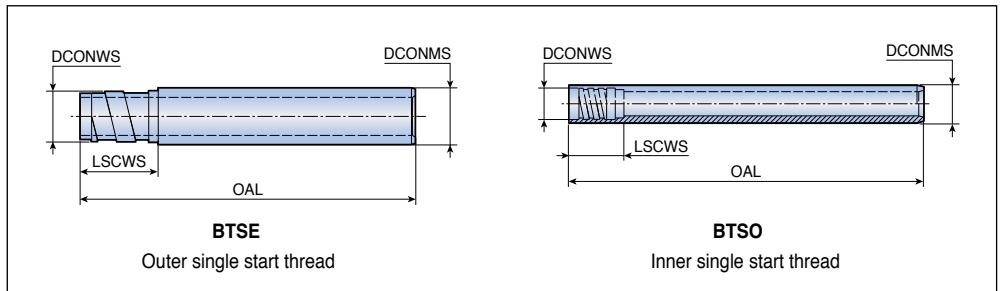


- Outer single start thread

| Designation | DC | Dimension (mm) | | |
|------------------|-------------|----------------|--------|-------|
| | | DCONMS | DCONWS | LSCWS |
| BTSE 012A | 14.50-15.00 | 12.0 | 11.5 | 23 |
| 012B | 15.01-15.50 | 12.0 | 11.8 | 23 |
| 013A | 15.51-16.00 | 13.0 | 12.4 | 23 |
| 013B | 16.01-16.50 | 13.0 | 12.7 | 23 |
| 014A | 16.51-17.25 | 14.0 | 13.4 | 23 |
| 014B | 17.26-18.00 | 14.0 | 13.7 | 23 |
| 015 | 18.01-19.00 | 15.0 | 14.4 | 23 |
| 016.5 | 19.01-19.99 | 16.5 | 15.4 | 23 |
| 018 | 20.00-21.99 | 18.0 | 16.5 | 26 |
| 020 | 22.00-24.99 | 20.0 | 19.0 | 26 |
| 022 | 25.00-26.99 | 22.0 | 20.0 | 26 |
| 024 | 27.00-29.99 | 24.0 | 22.0 | 26 |
| 026 | 30.00-31.99 | 26.0 | 24.0 | 26 |
| 028 | 32.00-33.99 | 28.0 | 26.0 | 26 |
| 030 | 34.00-36.99 | 30.0 | 27.0 | 41 |
| 033 | 37.00-39.99 | 33.0 | 30.0 | 41 |
| 036 | 40.00-43.99 | 36.0 | 33.0 | 41 |
| 039 | 44.00-46.99 | 39.0 | 37.0 | 41 |
| 043 | 47.00-51.99 | 43.0 | 41.0 | 41 |
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- Please indicate overall length (OAL) when ordering

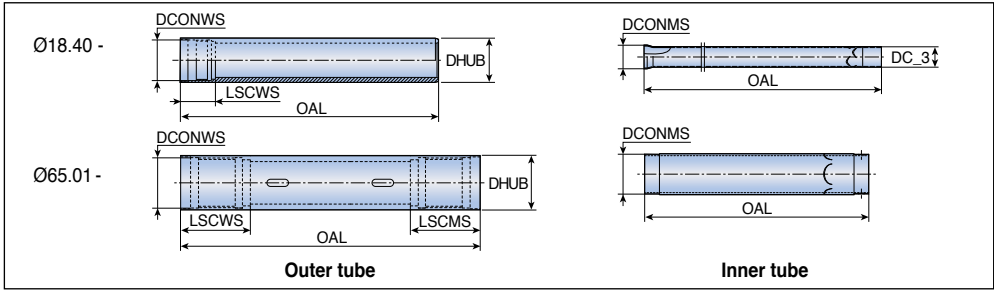
Single tube



| Designation | DC | Dimension (mm) | | | |
|-----------------|---------------|----------------|--------|-------|------|
| | | DCONMS | DCONWS | LSCWS | |
| BTSE 047 | 52.00-56.99 | 47.0 | 44 | - | 41 |
| 051 | 57.00-60.99 | 51.0 | 49 | - | 41 |
| 056 | 61.00-67.99 | 56.0 | 53 | - | 41 |
| 062 | 68.00-74.99 | 62.0 | 59 | - | 41 |
| 068 | 75.00-80.99 | 68.0 | 65 | - | 71 |
| 075 | 81.00-90.99 | 75.0 | 71 | - | 71 |
| 082 | 91.00-98.99 | 82.0 | 79 | - | 71 |
| 094 | 99.00-110.99 | 94.0 | 90 | - | 71 |
| 106 | 111.00-122.99 | 106.0 | 102 | - | 71 |
| 118 | 123.00-134.99 | 118.0 | 114 | - | 71 |
| 130 | 135.00-148.99 | 130.0 | 126 | - | 71 |
| 142 | 149.00-161.99 | 142.0 | 139 | - | 71 |
| 154 | 162.00-173.99 | 154.0 | 151 | - | 86 |
| 166 | 174.00-185.99 | 166.0 | 163 | - | 86 |
| 178 | 186.00-197.99 | 178.0 | 175 | - | 86 |
| 190 | 198.00-209.99 | 190.0 | 187 | - | 86 |
| 202 | 210.00-221.99 | 202.0 | 199 | - | 86 |
| 214 | 222.00-233.99 | 214.0 | 211 | - | 86 |
| 226 | 234.00-245.99 | 226.0 | 223 | - | 86 |
| 238 | 246.00-257.99 | 238.0 | 235 | - | 86 |
| 250 | 258.00-269.99 | 250.0 | 247 | - | 121 |
| 262 | 270.00-281.99 | 262.0 | 259 | - | 121 |
| 274 | 282.00-293.99 | 274.0 | 271 | - | 121 |
| BTSO 071 | 8.00-8.99 | 7.1 | - | 6.0 | 13.5 |
| 083 | 9.00-9.99 | 8.3 | - | 7.2 | 13.5 |
| 090 | 10.00-10.99 | 9.0 | - | 7.6 | 13.5 |
| 100 | 11.00-11.99 | 10.0 | - | 8.6 | 13.5 |
| 110 | 12.00-13.49 | 11.0 | - | 9.1 | 13.5 |
| 120 | 13.50-14.79 | 12.0 | - | 10.8 | 13.5 |
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• Please indicate overall length (OAL) when ordering

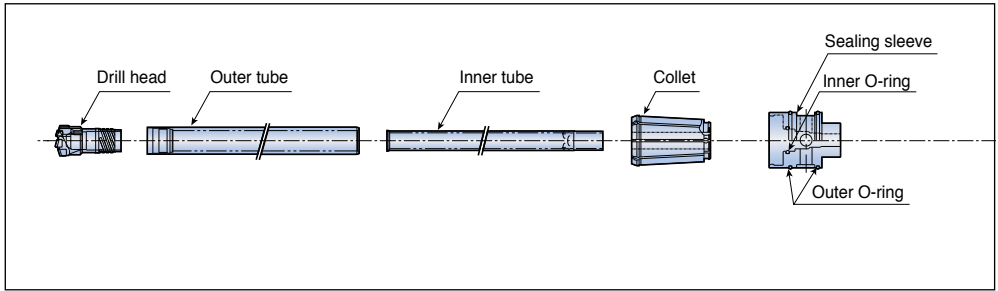
Double tube



| DC | Outer tube | Dimension (mm) | | | Inner tube | Dimension (mm) | |
|---------------|-----------------|----------------|--------|-------|-----------------|----------------|------|
| | | DHUB | DCONWS | LSCWS | | DCONMS | DC_3 |
| 18.40-20.00 | BTDO 018 | 18.0 | 16 | 27.5 | BTDI 012 | 12 | 10 |
| 20.01-21.80 | 019.5 | 19.5 | 18 | 30 | 014 | 14 | 12 |
| 21.81-24.10 | 021.5 | 21.5 | 19.5 | 30 | 015 | 15 | 13 |
| 24.11-26.40 | 023.5 | 23.5 | 21 | 30 | 016 | 16 | 14 |
| 26.41-28.70 | 026 | 26.0 | 23.5 | 33 | 018 | 18 | 16 |
| 28.71-31.00 | 028 | 28.0 | 25.5 | 33 | 020 | 20 | 18 |
| 31.01-33.30 | 030.5 | 30.5 | 28 | 33 | 022 | 22 | 20 |
| 33.31-36.20 | 033 | 33.0 | 30 | 40 | 024 | 24 | 22 |
| 36.21-39.60 | 035.5 | 35.5 | 33 | 40 | 026 | 26 | 24 |
| 39.61-43.00 | 039 | 39.0 | 36 | 40 | 029 | 29 | 27 |
| 43.01-47.00 | 042.5 | 42.5 | 39 | 40 | 032 | 32 | 30 |
| 47.01-51.70 | 046.5 | 46.5 | 43 | 44 | 035 | 35 | 32 |
| 51.71-56.20 | 051 | 51.0 | 47 | 44 | 039 | 39 | 36 |
| 56.21-65.00 | 055.5 | 55.5 | 51 | 44 | 043A | 43 | 40 |
| 65.01-69.99 | 056 | 56.0 | 52 | 75 | 043B | 40 | - |
| 70.00-72.99 | 062 | 62.0 | 58 | 75 | 048 | 44 | - |
| 73.00-79.99 | 068 | 68.0 | 63 | 75 | 053 | 48 | - |
| 80.00-86.99 | 075 | 75.0 | 70 | 97 | 059 | 54 | - |
| 87.00-99.99 | 082 | 82.0 | 77 | 97 | 066 | 60 | - |
| 100.00-111.99 | 094 | 94.0 | 89 | 97 | 078 | 70 | - |
| 112.00-123.99 | 106 | 106.0 | 101 | 118 | 090 | 80 | - |
| 124.00-135.99 | 118 | 118.0 | 113 | 118 | 092 | 80 | - |
| 136.00-147.99 | 130 | 130.0 | 125 | 118 | 104 | 95 | - |
| 148.00-159.99 | 142 | 142.0 | 137 | 139 | 116 | 100 | - |
| 160.00-171.99 | 154 | 154.0 | 149 | 139 | 128 | 120 | - |
| 172.00-183.99 | 166 | 166.0 | 161 | 139 | 138 | 130 | - |
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- Please indicate overall length (OAL) when ordering
- For diameter range 18.40 - 65.00 (BTDO 055.5) the inner tube should be ordered 30mm longer than outer tube
- For diameter range 65.01 - 123.99 (BTDO 056 - BTDO 106) the inner tube should be ordered 190mm longer than outer tube
- For diameter range 124.00 - 183.99 (BTDO 118 - BTDO 166) the inner tube should be ordered 220mm longer than outer tube

Assembly of Double Tube System

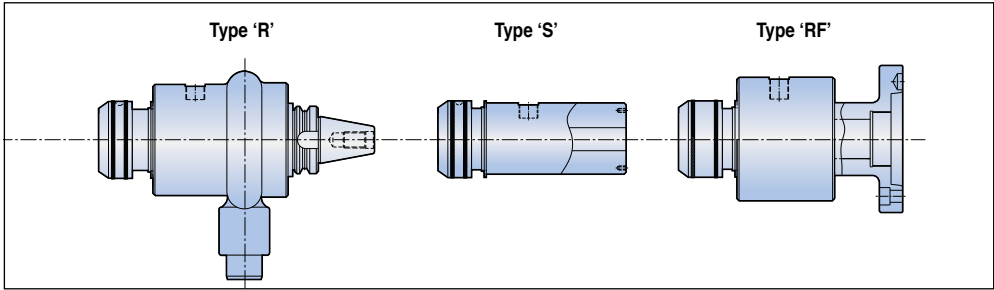


| Designation | | DC | Collet |
|-----------------|-----------------|-------------|---------------|
| BTDO 018 | BTDI 012 | 18.40-19.20 | COLLET 4-18 |
| 018 | 012 | 19.21-20.00 | COLLET 4-18 |
| 019.5 | 014 | 20.01-20.90 | COLLET 4-19.5 |
| 019.5 | 014 | 20.91-21.80 | COLLET 4-19.5 |
| 021.5 | 015 | 21.81-22.90 | COLLET 4-21.5 |
| 021.5 | 015 | 22.91-24.10 | COLLET 4-21.5 |
| 023.5 | 016 | 24.11-25.20 | COLLET 4-23.5 |
| 023.5 | 016 | 25.21-26.40 | COLLET 4-23.5 |
| 026 | 018 | 26.41-27.50 | COLLET 4-26 |
| 026 | 018 | 27.51-28.70 | COLLET 4-26 |
| 028 | 020 | 28.71-29.80 | COLLET 4-28 |
| 028 | 020 | 29.81-31.00 | COLLET 4-28 |
| 030.5 | 022 | 31.01-32.10 | COLLET 4-30.5 |
| 030.5 | 022 | 32.11-33.30 | COLLET 4-30.5 |
| 033 | 024 | 33.31-34.80 | COLLET 4-33 |
| 033 | 024 | 34.81-36.20 | COLLET 4-33 |
| 035.5 | 026 | 36.21-37.30 | COLLET 4-35.5 |
| 035.5 | 026 | 37.31-38.40 | COLLET 4-35.5 |
| 035.5 | 026 | 38.41-39.60 | COLLET 4-35.5 |
| 039 | 029 | 39.61-40.60 | COLLET 4-39 |
| 039 | 029 | 40.61-41.80 | COLLET 4-39 |
| 039 | 029 | 41.81-43.00 | COLLET 4-39 |
| 042.5 | 032 | 43.01-44.30 | COLLET 4-42.5 |
| 042.5 | 032 | 44.31-45.60 | COLLET 4-42.5 |
| 042.5 | 032 | 45.61-47.00 | COLLET 4-42.5 |
| 046.5 | 035 | 47.01-48.50 | COLLET 4-46.5 |
| 046.5 | 035 | 48.51-50.10 | COLLET 4-46.5 |
| 046.5 | 035 | 50.11-51.70 | COLLET 4-46.5 |
| 051 | 039 | 51.71-53.20 | COLLET 4-51 |
| 051 | 039 | 53.21-54.70 | COLLET 4-51 |
| 051 | 039 | 54.71-56.20 | COLLET 4-51 |
| 055.5 | 043A | 56.21-58.40 | COLLET 4-55.5 |
| 055.5 | 043A | 58.41-60.60 | COLLET 4-55.5 |
| 055.5 | 043A | 60.61-62.80 | COLLET 4-55.5 |
| 055.5 | 043A | 62.81-65.00 | COLLET 4-55.5 |

• Inner tube should be longer than outer tube. Please refer to page D135-D136 for details

Assembly of Double Tube System

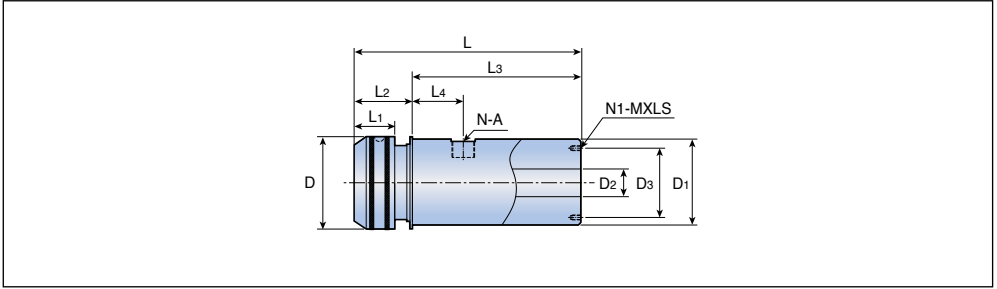
Connector



| Sealing sleeve | Outer O-ring | Inner O-ring | Connector |
|------------------------|--------------|--------------|---------------|
| SEALING SLEEVE 4R-18 | OOR 25.24 | IOR18 | DTC-4S/4R/4RF |
| SEALING SLEEVE 4R-18 | | IOR18 | |
| SEALING SLEEVE 4R-19.5 | | IOR19.5 | |
| SEALING SLEEVE 4R-19.5 | | IOR19.5 | |
| SEALING SLEEVE 4R-21.5 | | IOR21.5 | |
| SEALING SLEEVE 4R-21.5 | | IOR21.5 | |
| SEALING SLEEVE 4R-23.5 | | IOR23.5 | |
| SEALING SLEEVE 4R-23.5 | | IOR23.5 | |
| SEALING SLEEVE 4R-26 | | IOR26 | |
| SEALING SLEEVE 4R-26 | | IOR26 | |
| SEALING SLEEVE 4R-28 | | IOR28 | |
| SEALING SLEEVE 4R-28 | | IOR28 | |
| SEALING SLEEVE 4R-30.5 | | IOR30.5 | |
| SEALING SLEEVE 4R-30.5 | | IOR30.5 | |
| SEALING SLEEVE 4R-33 | IOR33 | | |
| SEALING SLEEVE 4R-33 | IOR33 | | |
| SEALING SLEEVE 4R-35.5 | OOR65 | IOR35.5 | |
| SEALING SLEEVE 4R-35.5 | | IOR35.5 | |
| SEALING SLEEVE 4R-35.5 | | IOR35.5 | |
| SEALING SLEEVE 4R-39 | | IOR39 | |
| SEALING SLEEVE 4R-39 | | IOR39 | |
| SEALING SLEEVE 4R-39 | | IOR39 | |
| SEALING SLEEVE 4R-42.5 | | IOR42.5 | |
| SEALING SLEEVE 4R-42.5 | | IOR42.5 | |
| SEALING SLEEVE 4R-42.5 | | IOR42.5 | |
| SEALING SLEEVE 4R-46.5 | | IOR46.5 | |
| SEALING SLEEVE 4R-46.5 | | IOR46.5 | |
| SEALING SLEEVE 4R-46.5 | | IOR46.5 | |
| SEALING SLEEVE 4R-51 | | IOR51 | |
| SEALING SLEEVE 4R-51 | | IOR51 | |
| SEALING SLEEVE 4R-51 | | IOR51 | |
| SEALING SLEEVE 4R-55.5 | | IOR55.5 | |
| SEALING SLEEVE 4R-55.5 | IOR55.5 | | |
| SEALING SLEEVE 4R-55.5 | IOR55.5 | | |
| SEALING SLEEVE 4R-55.5 | IOR55.5 | | |

• Inner tube should be longer than outer tube. Please refer to page D135-D136 for details

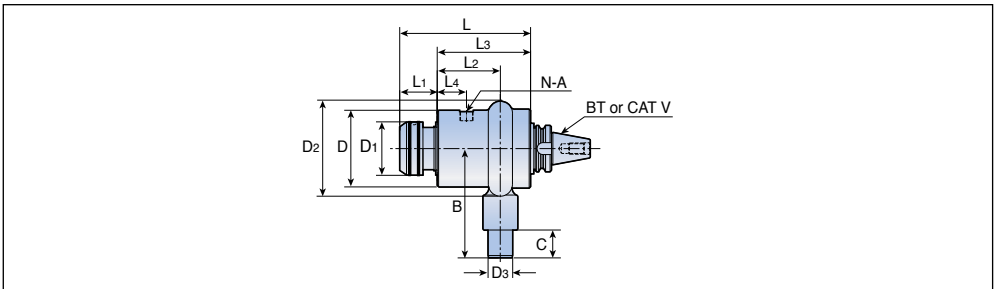
'S' type connector



| Designation | DC | D | D1 | D2 | D3 | L | L1 | L2 | L3 | L4 | N-A | N1-MXLS |
|---------------|------------|-----|-----|----|-----|-----|----|-----|-----|----|----------|---------|
| DTC 4S | 18.4-65.0 | 115 | 100 | 45 | 80 | 310 | 50 | 60 | 250 | 68 | 2-PT3/4" | 4-M8x15 |
| 5S | 65.0-123.9 | 164 | 140 | 81 | 120 | 415 | 47 | 115 | 300 | | 2-PT1" | 6-M8x20 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

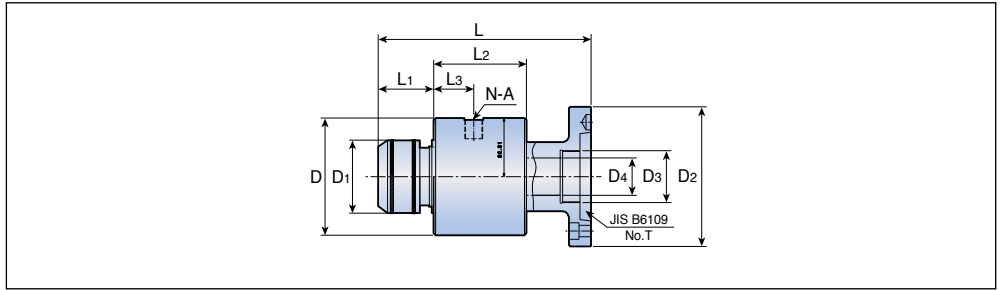
DTC-R

'R' type connector



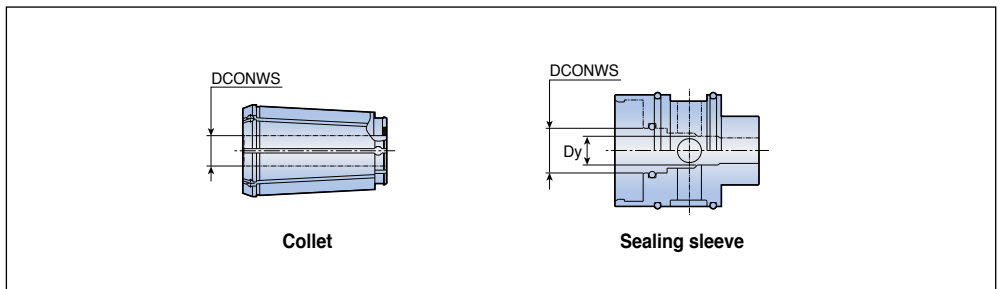
| Designation | DC | D | D1 | D2 | D3 | B | C | L | L1 | L2 | L3 | L4 | N-A |
|---------------|-------------|-----|-----|-----|-------|-------|-----|-------|------|-----|-----|-----|------------|
| DTC 4R | 18.4-65.0 | 165 | 115 | 206 | 53 | 186.5 | 60 | 319.7 | 59.2 | 152 | 228 | 75 | 2-PT1" |
| 5R | 65.0-123.9 | 225 | 164 | 312 | 100 | 310 | 100 | 382 | 62 | 201 | 320 | 95 | 2-PT1 1/4" |
| 6R | 124.0-183.9 | 350 | 244 | 445 | 152.4 | 412 | 120 | 487 | 75 | 250 | 412 | 118 | 4-PT1-1/4" |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

'RF' type connector



| Designation | DC | D | D1 | D2 | D3 | D4 | L | L1 | L2 | L3 | N-A |
|----------------|-----------|-----|-----|-----|-------|----|-------|------|-----|----|--------|
| DTC 4RF | 18.4-65.0 | 160 | 115 | 210 | M62x2 | 46 | 291.5 | 64.5 | 150 | 75 | 2-PT1" |

Collet / Sealing Sleeve

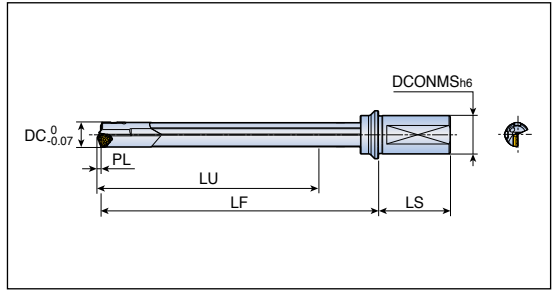


| Designation | DC | DCONWS | Designation | DC | DCONWS | Dy | Outer O-ring | Inner O-ring |
|--------------------|-------------|--------|----------------------------|-------------|--------|----|--------------|--------------|
| COLLET 4-18 | 18.40-20.00 | 18.0 | SEALING SLEEVE 4-18 | 18.40-20.00 | 18.0 | 10 | OOR 65 | IOR 18 |
| 4-19.5 | 20.01-21.80 | 19.5 | 4-19.5 | 20.01-21.80 | 19.5 | 12 | | IOR 19.5 |
| 4-21.5 | 21.81-24.10 | 21.5 | 4-21.5 | 21.81-24.10 | 21.5 | 13 | | IOR 21.5 |
| 4-23.5 | 24.11-26.40 | 23.5 | 4-23.5 | 24.11-26.40 | 23.5 | 14 | | IOR 23.5 |
| 4-26 | 26.41-28.70 | 26.0 | 4-26 | 26.41-28.70 | 26.0 | 16 | | IOR 26 |
| 4-28 | 28.71-31.00 | 28.0 | 4-28 | 28.71-31.00 | 28.0 | 18 | | IOR 28 |
| 4-30.5 | 31.01-33.30 | 30.5 | 4-30.5 | 31.01-33.30 | 30.5 | 20 | | IOR 30.5 |
| 4-33 | 33.31-36.20 | 33.0 | 4-33 | 33.31-36.20 | 33.0 | 22 | | IOR 33 |
| 4-35.5 | 36.21-39.60 | 35.5 | 4-35.5 | 36.21-39.60 | 35.5 | 24 | | IOR 35.5 |
| 4-39 | 39.61-43.00 | 39.0 | 4-39 | 39.61-43.00 | 39.0 | 27 | | IOR 39 |
| 4-42.5 | 43.01-47.00 | 42.5 | 4-42.5 | 43.01-47.00 | 42.5 | 30 | | IOR 42.5 |
| 4-46.5 | 47.01-51.70 | 46.5 | 4-46.5 | 47.01-51.70 | 46.5 | 32 | | IOR 46.5 |
| 4-51 | 51.71-56.20 | 51.0 | 4-51 | 51.71-56.20 | 51.0 | 36 | | IOR 51 |
| 4-55.5 | 56.21-65.00 | 55.5 | 4-55.5 | 56.21-65.00 | 55.5 | 40 | | IOR 55.5 |

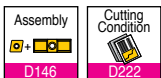
Standard gundrill holders



- Drilling depth: 10xDC - 25xDC



| Designation | Dimension (mm) | | | | | | |
|--------------------------|----------------|-----|-----|----|--------|------|-----|
| | DC | LU | LF | LS | DCONMS | PL | L/D |
| TRGD 16.00xM25-10 | 16.0 | 172 | 209 | 56 | 25 | 2.2 | 10 |
| 16.50xM25-10 | 16.5 | 172 | 209 | 56 | 25 | 2.2 | 10 |
| 17.00xM25-10 | 17.0 | 182 | 220 | 56 | 25 | 2.2 | 10 |
| 18.00xM25-10 | 18.0 | 193 | 232 | 56 | 25 | 3.0 | 10 |
| 19.00xM25-10 | 19.0 | 203 | 243 | 56 | 25 | 3.0 | 10 |
| 20.00xM32-10 | 20.0 | 213 | 255 | 60 | 32 | 3.2 | 10 |
| 29.00xM40-10 | 29.0 | 290 | 360 | 69 | 40 | 4.57 | 10 |
| 30.00xM40-10 | 30.0 | 310 | 383 | 69 | 40 | 4.57 | 10 |
| 31.00xM40-10 | 31.0 | 310 | 383 | 69 | 40 | 4.57 | 10 |
| 32.00xM40-10 | 33.0 | 320 | 395 | 69 | 40 | 4.57 | 10 |
| 14.00xM25-15 | 14.0 | 227 | 261 | 56 | 25 | 2.0 | 15 |
| 14.50xM25-15 | 14.5 | 227 | 262 | 56 | 25 | 2.0 | 15 |
| 15.00xM25-15 | 15.0 | 242 | 278 | 56 | 25 | 2.0 | 15 |
| 16.00xM25-15 | 16.0 | 257 | 294 | 56 | 25 | 2.2 | 15 |
| 16.50xM25-15 | 16.5 | 257 | 294 | 56 | 25 | 2.2 | 15 |
| 17.00xM25-15 | 17.0 | 272 | 310 | 56 | 25 | 2.2 | 15 |
| 17.50xM25-15 | 17.5 | 272 | 310 | 56 | 25 | 2.2 | 15 |
| 18.00xM25-15 | 18.0 | 288 | 327 | 56 | 25 | 3.0 | 15 |
| 18.50xM25-15 | 18.5 | 288 | 327 | 56 | 25 | 3.0 | 15 |
| 19.00xM25-15 | 19.0 | 303 | 343 | 56 | 25 | 3.0 | 15 |
| 19.50xM25-15 | 19.5 | 303 | 343 | 56 | 25 | 3.0 | 15 |
| 20.00xM32-15 | 20.0 | 318 | 360 | 60 | 32 | 3.2 | 15 |
| 21.00xM32-15 | 21.0 | 333 | 376 | 60 | 32 | 3.2 | 15 |
| 22.00xM32-15 | 22.0 | 348 | 393 | 60 | 32 | 3.4 | 15 |
| 23.00xM32-15 | 23.0 | 363 | 409 | 60 | 32 | 3.4 | 15 |
| 24.00xM32-15 | 24.0 | 378 | 426 | 60 | 32 | 3.4 | 15 |
| 25.00xM32-15 | 25.0 | 394 | 442 | 60 | 32 | 3.6 | 15 |
| 26.00xM40-15 | 26.0 | 409 | 449 | 70 | 40 | 3.6 | 15 |
| 27.00xM40-15 | 27.0 | 424 | 465 | 70 | 40 | 3.6 | 15 |
| 28.00xM40-15 | 28.0 | 424 | 467 | 70 | 40 | 3.6 | 15 |
| 14.00xM25-20 | 14.0 | 302 | 336 | 56 | 25 | 2.0 | 20 |
| 14.50xM25-20 | 14.5 | 302 | 337 | 56 | 25 | 2.0 | 20 |
| 15.00xM25-20 | 15.0 | 322 | 358 | 56 | 25 | 2.0 | 20 |
| 29.00xM40-20 | 29.0 | 580 | 650 | 69 | 40 | 4.57 | 20 |
| 30.00xM40-20 | 30.0 | 620 | 693 | 69 | 40 | 4.57 | 20 |



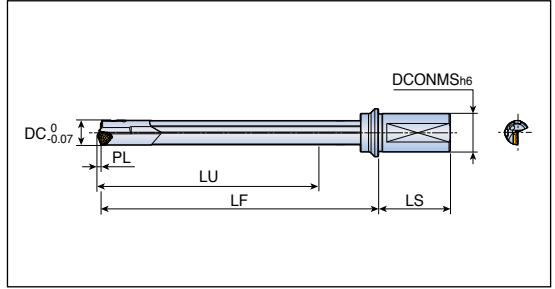
- Guide pad is sold separately from drill body.

- Available upon request

Standard gundrill holders



- Drilling depth: 10xDC - 25xDC



Insert & guide pad

| Tool dia. (mm) | Insert | | | Guide pad | | |
|----------------|-----------------------|---------------|--------|--|-----------|--------|
| | Insert | Screw | Wrench | Guide pad | Screw | Wrench |
| 14.00-15.99 | TOGT 070304 RS TT9030 | SR14-560/S | T-8F | PAD-GP05-18-060-DC-SB PAD-GP05-18-060-DC-SC | SR 34-508 | T-7F |
| 16.00-18.00 | TOGT 080305 RS TT9030 | SR14-560/S | T-8F | PAD-GP05-18-075-DC-SB PAD-GP05-18-075-DC-SC | SR 34-508 | T-7F |
| 18.01-20.00 | TOGT 090305 RS TT9030 | CSTB2.5S* | T-8F | PAD-GP06-20-085-DC-SB PAD-GP06-20-085-DC-SC | SR 34-508 | T-7F |
| 20.01-21.00 | TOGT 100305 RS TT9030 | CSTB3S* | T-9F | | | |
| 21.01-21.99 | TOGT 100305 RS TT9030 | CSTB3S* | T-9F | PAD-GP06-20-100-DC-SB PAD-GP06-20-100-DC-SC | SR 34-508 | T-7F |
| 22.00-25.00 | TOGT 110405 RS TT9030 | CSTB3.5H* | T-15F | | | |
| 25.01-28.00 | TOGT 120405 RS TT9030 | CSTB3.5H* | T-15F | PAD-GP06-20-120-DC-SB PAD-GP06-20-120-DC-SC | SR 34-508 | T-7F |
| 28.01-29.99 | TOGT 130408 RS | SR 16-212/L10 | T-20/5 | PAD-GP06-20-120-DC-SB PAD-GP06-20-120-DC-SC | SR 34-508 | T-7F |
| 30.00-32.00 | TOGT 130408 RS | SR 16-212/L10 | T-20/5 | PAD-GP07-20-120-DC-SB PAD-GP06-20-120-DC-SC | CSTB-3S | T-9F |

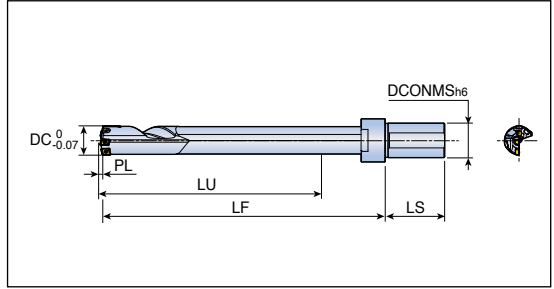
- Guide pad with "SB" is the first choice in general purpose machining.
- "SC" is an excellent toughness grade used with water-soluble coolant.
- Inserts and guide pads must be ordered separately



Standard gundrill holders



- Drilling depth: 10xDC - 15xDC



| Designation | Dimension (mm) | | | | | | |
|---------------------------|----------------|-----|-----|----|--------|-----|-----|
| | DC | LU | LF | LS | DCONMS | PL | L/D |
| TRGD3 29.00XF40-10 | 29.0 | 293 | 360 | 69 | 40 | 2.6 | 10 |
| 30.00XF40-10 | 30.0 | 313 | 383 | 69 | 40 | 2.9 | 10 |
| 31.00XF40-10 | 31.0 | 313 | 383 | 69 | 40 | 2.9 | 10 |
| 32.00XF40-10 | 32.0 | 323 | 395 | 69 | 40 | 3.0 | 10 |
| 33.00XF40-10 | 33.0 | 333 | 406 | 69 | 40 | 3.1 | 10 |
| 34.00XF40-10 | 34.0 | 343 | 418 | 69 | 40 | 3.0 | 10 |
| 35.00XF40-10 | 35.0 | 353 | 428 | 69 | 40 | 3.1 | 10 |
| 36.00XF40-10 | 36.0 | 363 | 441 | 69 | 40 | 3.1 | 10 |
| 29.00XF40-15 | 29.0 | 438 | 505 | 69 | 40 | 2.6 | 15 |
| 30.00XF40-15 | 30.0 | 468 | 538 | 69 | 40 | 2.9 | 15 |
| 31.00XF40-15 | 31.0 | 468 | 538 | 69 | 40 | 2.9 | 15 |
| 32.00XF40-15 | 32.0 | 483 | 555 | 69 | 40 | 3.0 | 15 |
| 33.00XF40-15 | 33.0 | 498 | 571 | 69 | 40 | 3.1 | 15 |
| 34.00XF40-15 | 34.0 | 513 | 588 | 69 | 40 | 3.0 | 15 |
| 35.00XF40-15 | 35.0 | 528 | 603 | 69 | 40 | 3.1 | 15 |
| 36.00XF40-15 | 36.0 | 543 | 621 | 69 | 40 | 3.1 | 15 |

- Guide pad is sold separately from drill body.
- Supply up to 40.0mm drill diameter

- Available upon request

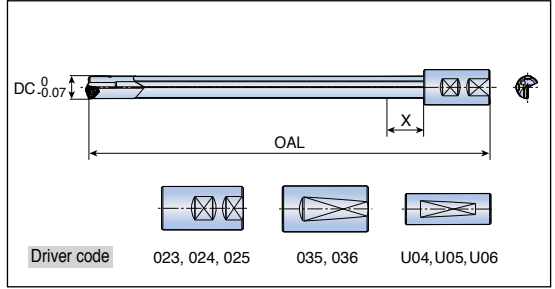
Insert & guide pad

| Parts | Diameter (mm) | | | | |
|--------|-------------------|--|--|--|--|
| | 29.0-29.99 | 30.0-33.0 | 33.01-35.0 | 35.01-36.0 | |
| Insert | Peripheral insert | NPHT 060304R-G-P | NPHT 080404R-G-P | NPHT 080404R-G-P | NPHT 080404R-G-P |
| | Screw | CSTB2.2 | CSTB2.5 | CSTB2.5 | CSTB2.5 |
| | Wrench | T-7F | T-8F | T-8F | T-8F |
| | Inner insert | NPMT 060304R-G-I | NPMT 070404R-G-I | NPMT 070404R-G-I | NPMT 070404R-G-I |
| | Screw | CSTB2.2 | CSTB2.5 | CSTB2.5 | CSTB2.5 |
| | Wrench | T-7F | T-8F | T-8F | T-8F |
| | Center insert | NPMT 070408L-G-C | NPMT 070408L-G-C | NPMT 070408L-G-C | NPMT 100408L-G-C |
| | Screw | CSTB2.5 | CSTB2.6 | CSTB2.7 | CSTB2.8 |
| Pad | Wrench | T-8F | T-8F | T-8F | T-8F |
| | Guide pad | PAD-GP06-20-120-DC-SB PAD-GP06-20-120-DC-SC | PAD-GP06-20-120-DC-SB PAD-GP06-20-120-DC-SC | PAD-GP07-20-120-DC-SB PAD-GP07-20-120-DC-SC | PAD-GP07-20-120-DC-SB PAD-GP07-20-120-DC-SC |
| | Screw | SR 34-508 | SR 34-508 | CSTB3S | CSTB3S |
| | Wrench | T-7F | T-7F | T-9F | T-9F |



- Inserts and guide pads must be ordered separately

Standard gundrill holders



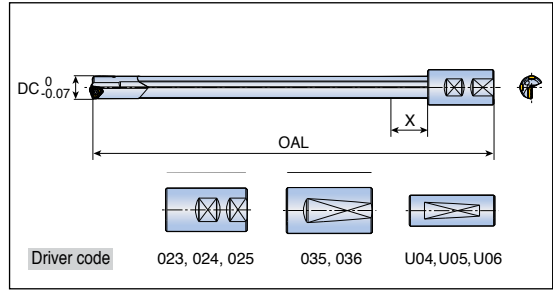
| Designation | Driver code | Dimension (mm) | | |
|----------------------------|-------------------|----------------|------|----|
| | | DC | OAL | X |
| TRGDL 14.00X800-XXX | U04 023 | 14 | 800 | 21 |
| 14.00X1000-XXX | | 14 | 1000 | 21 |
| 14.00X1650-XXX | | 14 | 1650 | 21 |
| 14.50X800-XXX | | 14.5 | 800 | 22 |
| 14.50X1000-XXX | | 14.5 | 1000 | 22 |
| 14.50X1650-XXX | | 14.5 | 1650 | 22 |
| 15.00X800-XXX | | 15 | 800 | 23 |
| 15.00X1000-XXX | | 15 | 1000 | 23 |
| 15.00X1650-XXX | | 15 | 1650 | 23 |
| 16.00x800-XXX | U04 023 035 | 16 | 800 | 24 |
| 16.00x1000-XXX | | 16 | 1000 | 24 |
| 16.00x1500-XXX | | 16 | 1500 | 24 |
| 17.00x1000-XXX | | 17 | 1000 | 25 |
| 17.00x1500-XXX | | 17 | 1500 | 25 |
| 18.00x800-XXX | | 18 | 800 | 27 |
| 18.00x1000-XXX | | 18 | 1000 | 27 |
| 18.00x1500-XXX | | 18 | 1500 | 27 |
| 19.00x800-XXX | | 19 | 800 | 28 |
| 19.00x1000-XXX | 19 | 1000 | 28 | |
| 19.00x1500-XXX | 19 | 1500 | 28 | |
| 20.00x800-XXX | U05 024 036 | 20 | 800 | 30 |
| 20.00x1000-XXX | | 20 | 1000 | 30 |
| 20.00x1500-XXX | | 20 | 1500 | 30 |
| 21.00x1000-XXX | | 21 | 1000 | 31 |
| 21.00x1500-XXX | | 21 | 1500 | 31 |
| 22.00x1000-XXX | | 22 | 1000 | 33 |
| 22.00x1500-XXX | | 22 | 1500 | 33 |
| 23.00x1000-XXX | | 23 | 1000 | 34 |
| 23.00x1500-XXX | | 23 | 1500 | 34 |
| 24.00x1000-XXX | | 24 | 1000 | 36 |
| 24.00x1500-XXX | | 24 | 1500 | 36 |
| 25.00x1000-XXX | 25 | 1000 | 37 | |
| 25.00x1500-XXX | 25 | 1500 | 37 | |



• Guide pad is sold separately from drill body.

- Available upon request
- Select "XXX" driver code

Standard gundrill holders



| Designation | Driver code | Dimension (mm) | | |
|-----------------------------|--------------------------|----------------|------|----|
| | | DC | OAL | X |
| TRGDL 26.00x1000-XXX | U06 025 026 036 | 26 | 1000 | 39 |
| 26.00x1500-XXX | | 26 | 1500 | 39 |
| 27.00x1000-XXX | | 27 | 1000 | 40 |
| 27.00x1500-XXX | | 27 | 1500 | 40 |
| 28.00x1000-XXX | | 28 | 1000 | 42 |
| 28.00x1500-XXX | | 28 | 1500 | 42 |
| | | | | |
| | | | | |

• Guide pad is sold separately from drill body.

- Available upon request
- Select "XXX" driver code

Insert & guide pad

| Tool dia. (mm) | Insert | | | Guide pad | | |
|----------------|-----------------------|-------------|--------|--|-----------|--------|
| | Insert | Screw | Wrench | Guide pad | Screw | Wrench |
| 14.00-15.99 | TOGT 070304 RS TT9030 | SR 14-560/S | T-8F | PAD-GP05-18-060-DC-SB PAD-GP05-18-060-DC-SC | SR 34-508 | T-7F |
| 16.00-18.00 | TOGT 080305 RS TT9030 | SR 14-560/S | T-8F | PAD-GP05-18-075-DC-SB PAD-GP05-18-075-DC-SC | SR 34-508 | T-7F |
| 18.01-20.00 | TOGT 090305 RS TT9030 | CSTB2.5S* | T-8F | PAD-GP06-20-085-DC-SB PAD-GP06-20-085-DC-SC | SR 34-508 | T-7F |
| 20.01-21.00 | TOGT 100305 RS TT9030 | CSTB3S* | T-9F | | | |
| 21.01-21.99 | TOGT 100305 RS TT9030 | CSTB3S* | T-9F | PAD-GP06-20-100-DC-SB PAD-GP06-20-100-DC-SC | SR 34-508 | T-7F |
| 22.00-25.00 | TOGT 110405 RS TT9030 | CSTB3.5H* | T-15F | | | |
| 25.01-28.00 | TOGT 120405 RS TT9030 | CSTB4S* | T-15F | PAD-GP06-20-120-DC-SB PAD-GP06-20-120-DC-SC | SR 34-508 | T-7F |



- Guide pad with "SB" is the first choice in general purpose machining.
- "SC" is an excellent toughness grade used with water-soluble coolant.
- Inserts and guide pads must be ordered separately

Driver for TRGDL Type

| Driver | Tool diameter | Driver code | Dimension (mm) | |
|--------|---------------|-------------|----------------|--------|
| | | | LS | DCONMS |
| | 14.00-19.69 | 023 | 56 | 25.00 |
| | 16.00-25.69 | 024 | 60 | 32.00 |
| | 16.00-28.00 | 025 | 70 | 40.00 |
| | 16.00-28.00 | 026 | 80 | 50.00 |
| | 16.00-19.69 | 035 | 56 | 25.00 |
| | 16.00-25.69 | 036 | 60 | 32.00 |
| | 16.00-19.69 | U04 | 70 | 25.40 |
| | 16.00-25.69 | U05 | 70 | 31.75 |
| | 16.00-28.00 | U06 | 70 | 38.10 |

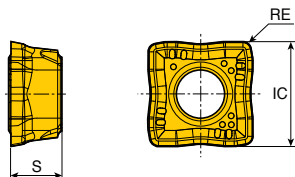
Drilling Heads & Inserts



SOMT...DP



Inserts for general purpose



| Size | Dimension (mm) | | |
|-----------|----------------|------|-----|
| | IC | S | RE |
| 04 | 4.4 | 2.38 | 0.4 |
| 05 | 4.9 | 2.38 | 0.4 |
| 06 | 5.7 | 2.38 | 0.4 |
| 07 | 6.8 | 2.80 | 0.6 |
| 08 | 7.9 | 3.97 | 0.6 |
| 09 | 9.2 | 3.97 | 0.8 |
| 11 | 11.0 | 3.97 | 0.8 |
| 13 | 12.8 | 4.40 | 0.8 |
| 15 | 15.0 | 4.80 | 1.0 |

| Insert | Designation | Coated | | | | | | Uncoated | |
|--------|-----------------------|--------|--------|--------|--------|--------|--------|----------|--|
| | | TT9080 | TT8020 | TT9300 | TT9030 | TT6030 | TT7400 | K10 | |
| | SOMT 040204 DP | ● | ● | ● | | | | | |
| | 050204 DP | ● | ● | ● | | | | | |
| | 060204 DP | ● | ● | ● | | | | | |
| | 070306 DP | ● | ● | ● | | | | | |
| | 08T306 DP | ● | ● | ● | | | | | |
| | 09T308 DP | ● | ● | ● | | | | | |
| | 11T308 DP | ● | ● | ● | | | | | |
| | 130408 DP | ● | ● | ● | | | | | |
| | 150510 DP | ● | ● | ● | | | | | |



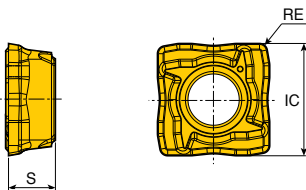
- TT9080: First choice for general purpose
- TT8020: For unstable condition
- TT9300: For high speed machining on a steel application (Peripheral **ONLY**)

●: Standard items

SOMT...DL



Inserts for low carbon steel



| Size | Dimension (mm) | | |
|-----------|----------------|------|-----|
| | IC | S | RE |
| 05 | 4.9 | 2.38 | 0.4 |
| 06 | 5.7 | 2.38 | 0.4 |
| 07 | 6.8 | 2.80 | 0.6 |
| 08 | 7.9 | 3.97 | 0.6 |
| 09 | 9.2 | 3.97 | 0.8 |
| 11 | 11.0 | 3.97 | 0.8 |
| 13 | 12.8 | 4.40 | 0.8 |
| 15 | 15.0 | 4.80 | 1.0 |

| Insert | Designation | Coated | | | | | | Uncoated | |
|--------|-----------------------|--------|--------|--------|--------|--------|--------|----------|--|
| | | TT9080 | TT9030 | TT8020 | TT6030 | TT9300 | TT7400 | K10 | |
| | SOMT 050204 DL | ● | | | | | | | |
| | 060204 DL | ● | | | | | | | |
| | 070306 DL | ● | | | | | | | |
| | 08T306 DL | ● | | | | | | | |
| | 09T308 DL | ● | | | | | | | |
| | 11T308 DL | ● | | | | | | | |
| | 130408 DL | ● | | | | | | | |
| | 150510 DL | ● | | | | | | | |



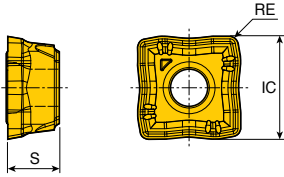
- TT9080: First choice for general purpose

●: Standard items

SOMT...DK



Inserts for cast iron



| Size | Dimension (mm) | | |
|-----------|----------------|------|-----|
| | IC | S | RE |
| 05 | 4.9 | 2.38 | 0.4 |
| 06 | 5.7 | 2.38 | 0.4 |
| 07 | 6.8 | 2.80 | 0.6 |
| 08 | 7.9 | 3.97 | 0.6 |
| 09 | 9.2 | 3.97 | 0.8 |
| 11 | 11.0 | 3.97 | 0.8 |
| 13 | 12.8 | 4.40 | 0.8 |
| 15 | 15.0 | 4.80 | 1.0 |

| Insert | Designation | Coated | | | | | | | Uncoated | | |
|--------|-----------------------|--------|--------|--------|--------|--------|--------|--------|----------|-----|--|
| | | TT9080 | TT8020 | TT9300 | TT9030 | TT6030 | TT6080 | TT7400 | | K10 | |
| | SOMT 050204 DK | | | | | ● | | | | | |
| | 060204 DK | | | | | ● | | | | | |
| | 070306 DK | | | | | ● | | | | | |
| | 08T306 DK | | | | | ● | | | | | |
| | 09T308 DK | | | | | ● | | | | | |
| | 11T308 DK | | | | | ● | | | | | |
| | 130408 DK | | | | | ● | | | | | |
| | 150510 DK | | | | | ● | | | | | |

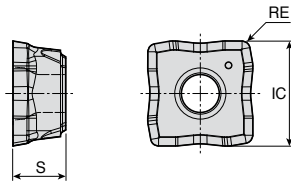


●: Standard items

SOMT...DA



Inserts for aluminum alloy



| Size | Dimension (mm) | | |
|-----------|----------------|------|-----|
| | IC | S | RE |
| 05 | 4.9 | 2.38 | 0.4 |
| 06 | 5.7 | 2.38 | 0.4 |
| 07 | 6.8 | 2.80 | 0.6 |
| 08 | 7.9 | 3.97 | 0.6 |
| 09 | 9.2 | 3.97 | 0.8 |
| 11 | 11.0 | 3.97 | 0.8 |
| 13 | 12.8 | 4.40 | 0.8 |
| 15 | 15.0 | 4.80 | 1.0 |

| Insert | Designation | Coated | | | | | | | Uncoated | | |
|--------|-----------------------|--------|--------|--------|--------|--------|--------|--------|----------|-----|--|
| | | TT9080 | TT8020 | TT9300 | TT9030 | TT6030 | TT6080 | TT7400 | | K10 | |
| | SOMT 050204 DA | | | | | | | | | ● | |
| | 060204 DA | | | | | | | | | ● | |
| | 070306 DA | | | | | | | | | ● | |
| | 08T306 DA | | | | | | | | | ● | |
| | 09T308 DA | | | | | | | | | ● | |
| | 11T308 DA | | | | | | | | | ● | |
| | 130408 DA | | | | | | | | | ● | |
| | 150510 DA | | | | | | | | | ● | |

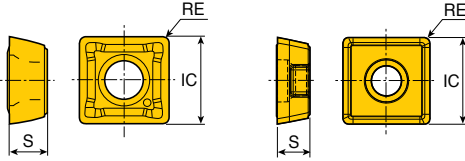


●: Standard items

SPMG...DG



Inserts for general purpose



SPMG 120408 DG

| Size | Dimension (mm) | | |
|-----------|----------------|------|-----|
| | IC | S | RE |
| 05 | 5.00 | 2.38 | 0.4 |
| 06 | 6.00 | 2.38 | 0.4 |
| 07 | 7.94 | 3.97 | 0.8 |
| 09 | 9.80 | 4.30 | 0.8 |
| 11 | 11.50 | 4.80 | 0.8 |
| 12 | 12.70 | 4.76 | 0.8 |
| 14 | 14.30 | 5.20 | 1.2 |

| Insert | Designation | Coated | | | | | | Uncoated | |
|--------|-----------------------|--------|--------|--------|--------|--------|--------|----------|--|
| | | TT9080 | TT9030 | TT8020 | TT6030 | TT9300 | TT7400 | | |
| | SPMG 050204 DG | | ● | ● | | | ● | | |
| | 060204 DG | | ● | ● | | | ● | | |
| | 07T308 DG | | ● | ● | | | ● | | |
| | 090408 DG | | ● | ● | | | ● | | |
| | 110408 DG | | ● | ● | | | ● | | |
| | 120408 DG | | ● | | | | | | |
| | 140512 DG | | ● | ● | | | ● | | |



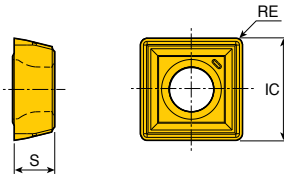
- TT9030: First choice for general purpose
- TT8020: For unstable condition
- TT7400: For high speed machining on a steel application (Peripheral **ONLY**)

●: Standard items

SPMG...DK



Inserts for cast iron



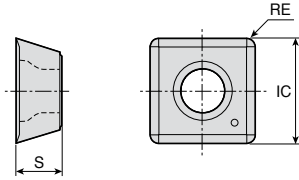
| Size | Dimension (mm) | | |
|-----------|----------------|------|-----|
| | IC | S | RE |
| 05 | 5.00 | 2.38 | 0.4 |
| 06 | 6.00 | 2.38 | 0.4 |
| 07 | 7.94 | 3.97 | 0.8 |
| 09 | 9.80 | 4.30 | 0.8 |
| 11 | 11.50 | 4.80 | 0.8 |
| 14 | 14.30 | 5.20 | 1.2 |

| Insert | Designation | Coated | | | | | | Uncoated | |
|--------|-----------------------|--------|--------|--------|--------|--------|--------|----------|--|
| | | TT9080 | TT9030 | TT8020 | TT6030 | TT9300 | TT7400 | | |
| | SPMG 050204 DK | | | | ● | | | | |
| | 060204 DK | | | | ● | | | | |
| | 07T308 DK | | | | ● | | | | |
| | 090408 DK | | | | ● | | | | |
| | 110408 DK | | | | ● | | | | |
| | 140512 DK | | | | ● | | | | |




●: Standard items

Inserts for aluminum alloy



| Size | Dimension (mm) | | |
|-----------|----------------|------|-----|
| | IC | S | RE |
| 05 | 5.00 | 2.38 | 0.4 |
| 06 | 6.00 | 2.38 | 0.4 |
| 07 | 7.94 | 3.97 | 0.8 |
| 09 | 9.80 | 4.30 | 0.8 |
| 11 | 11.50 | 4.80 | 0.8 |
| 14 | 14.30 | 5.20 | 1.2 |
| | | | |
| | | | |

| Insert | Designation | Coated | | | | | | Uncoated | |
|---|-----------------------|--------|--------|--------|--------|--------|--------|----------|-----|
| | | TT9080 | TT9030 | TT8020 | TT6030 | TT9300 | TT7400 | | K10 |
|  | SPGG 050204 DA | | | | | | | | ● |
| | 060204 DA | | | | | | | | ● |
| | 07T308 DA | | | | | | | | ● |
| | 090408 DA | | | | | | | | ● |
| | 110408 DA | | | | | | | | ● |
| | 140512 DA | | | | | | | | ● |
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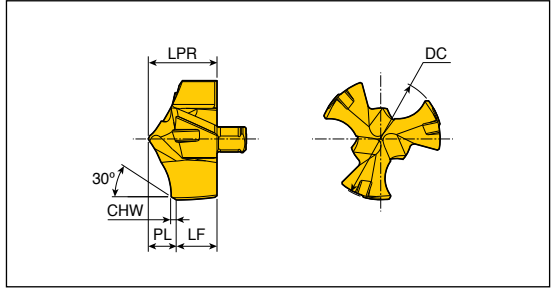
●: Standard items



3ED...-P+



3 flute drill heads



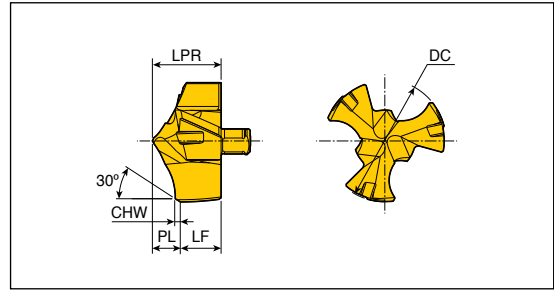
| Designation | Dimension (mm) | | | | | | Grade |
|-------------------|----------------|------|------|------|------|-----|-------|
| | DC | LPR | PL | LF | CHW | SSC | |
| 3ED-150-P+ | 15.0 | 8.40 | 3.31 | 5.09 | 0.50 | 15 | ● |
| 151-P+ | 15.1 | 8.40 | 3.31 | 5.09 | 0.50 | 15 | ● |
| 152-P+ | 15.2 | 8.40 | 3.31 | 5.09 | 0.50 | 15 | ● |
| 153-P+ | 15.3 | 8.40 | 3.31 | 5.09 | 0.50 | 15 | ● |
| 154-P+ | 15.4 | 8.40 | 3.31 | 5.09 | 0.50 | 15 | ● |
| 155-P+ | 15.5 | 8.40 | 3.32 | 5.08 | 0.50 | 15 | ● |
| 156-P+ | 15.6 | 8.40 | 3.32 | 5.08 | 0.50 | 15 | ● |
| 157-P+ | 15.7 | 8.40 | 3.32 | 5.08 | 0.50 | 15 | ● |
| 158-P+ | 15.8 | 8.40 | 3.32 | 5.08 | 0.50 | 15 | ● |
| 159-P+ | 15.9 | 8.40 | 3.32 | 5.08 | 0.50 | 15 | ● |
| 160-P+ | 16.0 | 9.00 | 3.70 | 5.30 | 0.70 | 16 | ● |
| 161-P+ | 16.1 | 9.00 | 3.70 | 5.30 | 0.70 | 16 | ● |
| 162-P+ | 16.2 | 9.00 | 3.70 | 5.30 | 0.70 | 16 | ● |
| 163-P+ | 16.3 | 9.00 | 3.70 | 5.30 | 0.70 | 16 | ● |
| 164-P+ | 16.4 | 9.00 | 3.70 | 5.30 | 0.70 | 16 | ● |
| 165-P+ | 16.5 | 9.00 | 3.71 | 5.29 | 0.70 | 16 | ● |
| 166-P+ | 16.6 | 9.00 | 3.71 | 5.29 | 0.70 | 16 | ● |
| 167-P+ | 16.7 | 9.00 | 3.71 | 5.29 | 0.70 | 16 | ● |
| 168-P+ | 16.8 | 9.00 | 3.71 | 5.29 | 0.70 | 16 | ● |
| 169-P+ | 16.9 | 9.00 | 3.71 | 5.29 | 0.70 | 16 | ● |
| 170-P+ | 17.0 | 9.50 | 3.88 | 5.62 | 0.70 | 17 | ● |
| 171-P+ | 17.1 | 9.50 | 3.88 | 5.62 | 0.70 | 17 | ● |
| 172-P+ | 17.2 | 9.50 | 3.88 | 5.62 | 0.70 | 17 | ● |
| 173-P+ | 17.3 | 9.50 | 3.88 | 5.62 | 0.70 | 17 | ● |
| 174-P+ | 17.4 | 9.50 | 3.88 | 5.62 | 0.70 | 17 | ● |
| 175-P+ | 17.5 | 9.50 | 3.89 | 5.61 | 0.70 | 17 | ● |
| 176-P+ | 17.6 | 9.50 | 3.89 | 5.61 | 0.70 | 17 | ● |
| 177-P+ | 17.7 | 9.50 | 3.89 | 5.61 | 0.70 | 17 | ● |
| 178-P+ | 17.8 | 9.50 | 3.89 | 5.61 | 0.70 | 17 | ● |
| 179-P+ | 17.9 | 9.50 | 3.89 | 5.61 | 0.70 | 17 | ● |
| | | | | | | | |
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● SSC: Seat size code

●: Standard items

3 flute drill heads



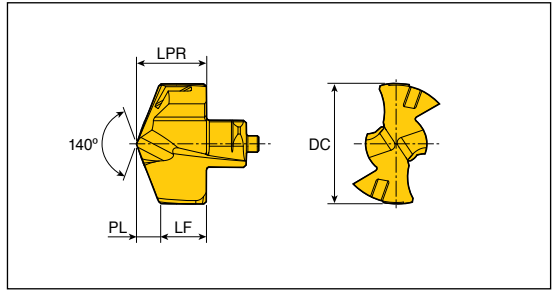
| Designation | Dimension (mm) | | | | | | Grade |
|-------------------|----------------|-------|------|------|------|-----|--------|
| | DC | LPR | PL | LF | CHW | SSC | TT5130 |
| 3ED-180-P+ | 18.0 | 10.10 | 4.07 | 6.03 | 0.70 | 18 | ● |
| 181-P+ | 18.1 | 10.10 | 4.07 | 6.03 | 0.70 | 18 | ● |
| 182-P+ | 18.2 | 10.10 | 4.07 | 6.03 | 0.70 | 18 | ● |
| 183-P+ | 18.3 | 10.10 | 4.07 | 6.03 | 0.70 | 18 | ● |
| 184-P+ | 18.4 | 10.10 | 4.07 | 6.03 | 0.70 | 18 | ● |
| 185-P+ | 18.5 | 10.10 | 4.08 | 6.02 | 0.70 | 18 | ● |
| 186-P+ | 18.6 | 10.10 | 4.08 | 6.02 | 0.70 | 18 | ● |
| 187-P+ | 18.7 | 10.10 | 4.08 | 6.02 | 0.70 | 18 | ● |
| 188-P+ | 18.8 | 10.10 | 4.08 | 6.02 | 0.70 | 18 | ● |
| 189-P+ | 18.9 | 10.10 | 4.08 | 6.02 | 0.70 | 18 | ● |
| 190-P+ | 19.0 | 10.70 | 4.26 | 6.44 | 0.70 | 19 | ● |
| 191-P+ | 19.1 | 10.70 | 4.26 | 6.44 | 0.70 | 19 | ● |
| 192-P+ | 19.2 | 10.70 | 4.26 | 6.44 | 0.70 | 19 | ● |
| 193-P+ | 19.3 | 10.70 | 4.26 | 6.44 | 0.70 | 19 | ● |
| 194-P+ | 19.4 | 10.70 | 4.26 | 6.44 | 0.70 | 19 | ● |
| 195-P+ | 19.5 | 10.70 | 4.27 | 6.43 | 0.70 | 19 | ● |
| 196-P+ | 19.6 | 10.70 | 4.27 | 6.43 | 0.70 | 19 | ● |
| 197-P+ | 19.7 | 10.70 | 4.27 | 6.43 | 0.70 | 19 | ● |
| 198-P+ | 19.8 | 10.70 | 4.27 | 6.43 | 0.70 | 19 | ● |
| 199-P+ | 19.9 | 10.70 | 4.27 | 6.43 | 0.70 | 19 | ● |
| 200-P+ | 20.0 | 11.30 | 4.44 | 6.86 | 0.70 | 20 | ● |
| 201-P+ | 20.1 | 11.30 | 4.44 | 6.86 | 0.70 | 20 | ● |
| 202-P+ | 20.2 | 11.30 | 4.44 | 6.86 | 0.70 | 20 | ● |
| 203-P+ | 20.3 | 11.30 | 4.44 | 6.86 | 0.70 | 20 | ● |
| 204-P+ | 20.4 | 11.30 | 4.44 | 6.86 | 0.70 | 20 | ● |
| 205-P+ | 20.5 | 11.30 | 4.45 | 6.85 | 0.70 | 20 | ● |
| 206-P+ | 20.6 | 11.30 | 4.45 | 6.85 | 0.70 | 20 | ● |
| 207-P+ | 20.7 | 11.30 | 4.45 | 6.85 | 0.70 | 20 | ● |
| 208-P+ | 20.8 | 11.30 | 4.45 | 6.85 | 0.70 | 20 | ● |
| 209-P+ | 20.9 | 11.30 | 4.45 | 6.85 | 0.70 | 20 | ● |
| | | | | | | | |
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● SSC: Seat size code

●: Standard items

Drill heads



| Designation | Dimension (mm) | | | | | Grade |
|------------------------|----------------|-----|------|------|-----|-------|
| | DC | LPR | PL | LF | SSC | |
| TCD - 060-P/M/K | 6.0 | 4.0 | 0.96 | 3.04 | 6 | ● |
| 061-P/M/K | 6.1 | 4.0 | 0.98 | 3.02 | 6 | ● |
| 062-P/M/K | 6.2 | 4.0 | 1.00 | 3.00 | 6 | ● |
| 063-P/M/K | 6.3 | 4.0 | 1.01 | 2.99 | 6 | ● |
| 064-P/M/K | 6.4 | 4.0 | 1.03 | 2.97 | 6 | ● |
| 065-P/M/K | 6.5 | 4.3 | 1.18 | 3.12 | 6.5 | ● |
| 066-P/M/K | 6.6 | 4.3 | 1.20 | 3.10 | 6.5 | ● |
| 067-P/M/K | 6.7 | 4.3 | 1.22 | 3.08 | 6.5 | ● |
| 068-P/M/K | 6.8 | 4.3 | 1.23 | 3.07 | 6.5 | ● |
| 069-P/M/K | 6.9 | 4.3 | 1.25 | 3.05 | 6.5 | ● |
| 070-P/M/K | 7.0 | 4.6 | 1.01 | 3.59 | 7 | ● |
| 071-P/M/K | 7.1 | 4.6 | 1.03 | 3.57 | 7 | ● |
| 072-P/M/K | 7.2 | 4.6 | 1.05 | 3.55 | 7 | ● |
| 073-P/M/K | 7.3 | 4.6 | 1.06 | 3.54 | 7 | ● |
| 074-P/M/K | 7.4 | 4.6 | 1.08 | 3.52 | 7 | ● |
| 075-P/M/K | 7.5 | 4.6 | 1.10 | 3.50 | 7 | ● |
| 076-P/M/K | 7.6 | 4.6 | 1.12 | 3.48 | 7 | ● |
| 077-P/M/K | 7.7 | 4.6 | 1.14 | 3.46 | 7 | ● |
| 078-P/M/K | 7.8 | 4.6 | 1.16 | 3.44 | 7 | ● |
| 079-P/M/K | 7.9 | 4.6 | 1.17 | 3.43 | 7 | ● |
| 080-P/M/K | 8.0 | 5.4 | 1.20 | 4.20 | 8 | ● |
| 081-P/M/K | 8.1 | 5.4 | 1.22 | 4.18 | 8 | ● |
| 082-P/M/K | 8.2 | 5.4 | 1.24 | 4.16 | 8 | ● |
| 083-P/M/K | 8.3 | 5.4 | 1.25 | 4.15 | 8 | ● |
| 084-P/M/K | 8.4 | 5.4 | 1.27 | 4.13 | 8 | ● |
| 085-P/M/K | 8.5 | 5.4 | 1.29 | 4.11 | 8 | ● |
| 086-P/M/K | 8.6 | 5.4 | 1.31 | 4.09 | 8 | ● |
| 087-P/M/K | 8.7 | 5.4 | 1.33 | 4.07 | 8 | ● |
| 088-P/M/K | 8.8 | 5.4 | 1.35 | 4.05 | 8 | ● |
| 089-P/M/K | 8.9 | 5.4 | 1.36 | 4.04 | 8 | ● |
| 090-P/M/K | 9.0 | 5.8 | 1.35 | 4.45 | 9 | ● |
| 091-P/M/K | 9.1 | 5.8 | 1.37 | 4.43 | 9 | ● |
| 092-P/M/K | 9.2 | 5.8 | 1.39 | 4.41 | 9 | ● |
| 093-P/M/K | 9.3 | 5.8 | 1.40 | 4.40 | 9 | ● |
| 094-P/M/K | 9.4 | 5.8 | 1.42 | 4.38 | 9 | ● |



• Drill head can be ordered by an application
 Order example) Diameter 10.0mm drill head for
 ISO P application: TCD-100-P TT9080

●: Standard items



Steel

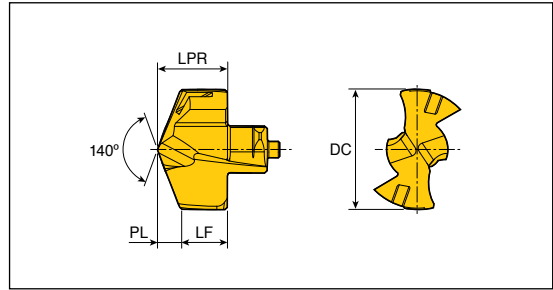


Stainless steel



Cast iron

Drill heads



| Designation | Dimension (mm) | | | | | Grade |
|------------------------|----------------|-----|------|------|-----|--------|
| | DC | LPR | PL | LF | SSC | TT9080 |
| TCD - 095-P/M/K | 9.5 | 5.8 | 1.44 | 4.36 | 9 | ● |
| 096-P/M/K | 9.6 | 5.8 | 1.46 | 4.34 | 9 | ● |
| 097-P/M/K | 9.7 | 5.8 | 1.48 | 4.32 | 9 | ● |
| 098-P/M/K | 9.8 | 5.8 | 1.50 | 4.30 | 9 | ● |
| 099-P/M/K | 9.9 | 5.8 | 1.51 | 4.29 | 9 | ● |
| 100-P/M/K | 10.0 | 6.2 | 1.50 | 4.70 | 10 | ● |
| 101-P/M/K | 10.1 | 6.2 | 1.52 | 4.68 | 10 | ● |
| 102-P/M/K | 10.2 | 6.2 | 1.54 | 4.66 | 10 | ● |
| 103-P/M/K | 10.3 | 6.2 | 1.55 | 4.65 | 10 | ● |
| 104-P/M/K | 10.4 | 6.2 | 1.57 | 4.63 | 10 | ● |
| 105-P/M/K | 10.5 | 6.2 | 1.59 | 4.61 | 10 | ● |
| 106-P/M/K | 10.6 | 6.2 | 1.61 | 4.59 | 10 | ● |
| 107-P/M/K | 10.7 | 6.2 | 1.63 | 4.57 | 10 | ● |
| 108-P/M/K | 10.8 | 6.2 | 1.65 | 4.55 | 10 | ● |
| 109-P/M/K | 10.9 | 6.2 | 1.66 | 4.54 | 10 | ● |
| 110-P/M/K | 11.0 | 6.6 | 1.67 | 4.93 | 11 | ● |
| 111-P/M/K | 11.1 | 6.6 | 1.69 | 4.91 | 11 | ● |
| 112-P/M/K | 11.2 | 6.6 | 1.71 | 4.89 | 11 | ● |
| 113-P/M/K | 11.3 | 6.6 | 1.72 | 4.88 | 11 | ● |
| 114-P/M/K | 11.4 | 6.6 | 1.74 | 4.86 | 11 | ● |
| 115-P/M/K | 11.5 | 6.6 | 1.76 | 4.84 | 11 | ● |
| 116-P/M/K | 11.6 | 6.6 | 1.78 | 4.82 | 11 | ● |
| 117-P/M/K | 11.7 | 6.6 | 1.80 | 4.80 | 11 | ● |
| 118-P/M/K | 11.8 | 6.6 | 1.82 | 4.78 | 11 | ● |
| 119-P/M/K | 11.9 | 6.6 | 1.83 | 4.77 | 11 | ● |
| 120-P/M/K | 12.0 | 7.0 | 1.82 | 5.18 | 12 | ● |
| 121-P/M/K | 12.1 | 7.0 | 1.84 | 5.16 | 12 | ● |
| 122-P/M/K | 12.2 | 7.0 | 1.86 | 5.14 | 12 | ● |
| 123-P/M/K | 12.3 | 7.0 | 1.87 | 5.13 | 12 | ● |
| 124-P/M/K | 12.4 | 7.0 | 1.89 | 5.11 | 12 | ● |
| 125-P/M/K | 12.5 | 7.0 | 1.91 | 5.09 | 12 | ● |
| 126-P/M/K | 12.6 | 7.0 | 1.93 | 5.07 | 12 | ● |
| 127-P/M/K | 12.7 | 7.0 | 1.95 | 5.05 | 12 | ● |
| 128-P/M/K | 12.8 | 7.0 | 1.97 | 5.03 | 12 | ● |
| 129-P/M/K | 12.9 | 7.0 | 1.98 | 5.02 | 12 | ● |

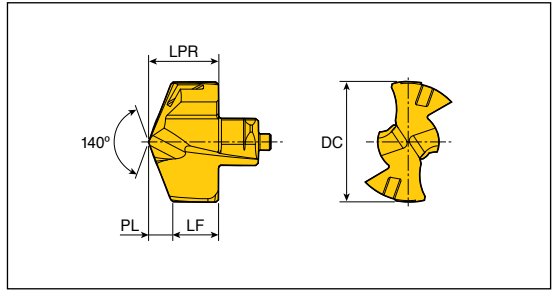


● Drill head can be ordered by an application
 Order example) Diameter 10.0mm drill head for
 ISO P application: TCD-100-P TT9080

●: Standard items

P Steel **M** Stainless steel **K** Cast iron

Drill heads



| Designation | Dimension (mm) | | | | | Grade |
|------------------------|----------------|-----|------|------|-----|-------|
| | DC | LPR | PL | LF | SSC | |
| TCD - 130-P/M/K | 13.0 | 7.6 | 1.96 | 5.64 | 13 | ● |
| 131-P/M/K | 13.1 | 7.6 | 1.98 | 5.62 | 13 | ● |
| 132-P/M/K | 13.2 | 7.6 | 2.00 | 5.60 | 13 | ● |
| 133-P/M/K | 13.3 | 7.6 | 2.01 | 5.59 | 13 | ● |
| 134-P/M/K | 13.4 | 7.6 | 2.03 | 5.57 | 13 | ● |
| 135-P/M/K | 13.5 | 7.6 | 2.05 | 5.55 | 13 | ● |
| 136-P/M/K | 13.6 | 7.6 | 2.07 | 5.53 | 13 | ● |
| 137-P/M/K | 13.7 | 7.6 | 2.09 | 5.51 | 13 | ● |
| 138-P/M/K | 13.8 | 7.6 | 2.11 | 5.49 | 13 | ● |
| 139-P/M/K | 13.9 | 7.6 | 2.12 | 5.48 | 13 | ● |
| 140-P/M/K | 14.0 | 8.1 | 2.12 | 5.98 | 14 | ● |
| 141-P/M/K | 14.1 | 8.1 | 2.14 | 5.96 | 14 | ● |
| 142-P/M/K | 14.2 | 8.1 | 2.16 | 5.94 | 14 | ● |
| 143-P/M/K | 14.3 | 8.1 | 2.17 | 5.93 | 14 | ● |
| 144-P/M/K | 14.4 | 8.1 | 2.19 | 5.91 | 14 | ● |
| 145-P/M/K | 14.5 | 8.1 | 2.21 | 5.89 | 14 | ● |
| 146-P/M/K | 14.6 | 8.1 | 2.23 | 5.87 | 14 | ● |
| 147-P/M/K | 14.7 | 8.1 | 2.25 | 5.85 | 14 | ● |
| 148-P/M/K | 14.8 | 8.1 | 2.27 | 5.83 | 14 | ● |
| 149-P/M/K | 14.9 | 8.1 | 2.28 | 5.82 | 14 | ● |
| 150-P/M/K | 15.0 | 8.7 | 2.27 | 6.43 | 15 | ● |
| 151-P/M/K | 15.1 | 8.7 | 2.29 | 6.41 | 15 | ● |
| 152-P/M/K | 15.2 | 8.7 | 2.31 | 6.39 | 15 | ● |
| 153-P/M/K | 15.3 | 8.7 | 2.32 | 6.38 | 15 | ● |
| 154-P/M/K | 15.4 | 8.7 | 2.34 | 6.36 | 15 | ● |
| 155-P/M/K | 15.5 | 8.7 | 2.36 | 6.34 | 15 | ● |
| 156-P/M/K | 15.6 | 8.7 | 2.38 | 6.32 | 15 | ● |
| 157-P/M/K | 15.7 | 8.7 | 2.40 | 6.30 | 15 | ● |
| 158-P/M/K | 15.8 | 8.7 | 2.42 | 6.28 | 15 | ● |
| 159-P/M/K | 15.9 | 8.7 | 2.43 | 6.27 | 15 | ● |
| 160-P/M/K | 16.0 | 9.3 | 2.42 | 6.88 | 16 | ● |
| 161-P/M/K | 16.1 | 9.3 | 2.44 | 6.86 | 16 | ● |
| 162-P/M/K | 16.2 | 9.3 | 2.46 | 6.84 | 16 | ● |
| 163-P/M/K | 16.3 | 9.3 | 2.47 | 6.83 | 16 | ● |
| 164-P/M/K | 16.4 | 9.3 | 2.49 | 6.81 | 16 | ● |



• Drill head can be ordered by an application
 Order example) Diameter 10.0mm drill head for
 ISO P application: TCD-100-P TT9080

●: Standard items



Steel

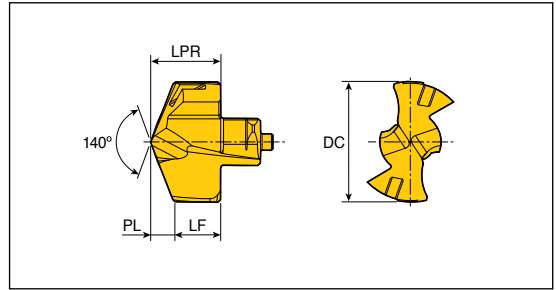


Stainless steel



Cast iron

Drill heads



| Designation | Dimension (mm) | | | | | Grade |
|------------------------|----------------|------|------|------|-----|--------|
| | DC | LPR | PL | LF | SSC | TT9080 |
| TCD - 165-P/M/K | 16.5 | 9.3 | 2.51 | 6.79 | 16 | ● |
| 166-P/M/K | 16.6 | 9.3 | 2.53 | 6.77 | 16 | ● |
| 167-P/M/K | 16.7 | 9.3 | 2.55 | 6.75 | 16 | ● |
| 168-P/M/K | 16.8 | 9.3 | 2.57 | 6.73 | 16 | ● |
| 169-P/M/K | 16.9 | 9.3 | 2.58 | 6.72 | 16 | ● |
| 170-P/M/K | 17.0 | 9.9 | 2.59 | 7.31 | 17 | ● |
| 171-P/M/K | 17.1 | 9.9 | 2.61 | 7.29 | 17 | ● |
| 172-P/M/K | 17.2 | 9.9 | 2.63 | 7.27 | 17 | ● |
| 173-P/M/K | 17.3 | 9.9 | 2.64 | 7.26 | 17 | ● |
| 174-P/M/K | 17.4 | 9.9 | 2.66 | 7.24 | 17 | ● |
| 175-P/M/K | 17.5 | 9.9 | 2.68 | 7.22 | 17 | ● |
| 176-P/M/K | 17.6 | 9.9 | 2.70 | 7.20 | 17 | ● |
| 177-P/M/K | 17.7 | 9.9 | 2.72 | 7.18 | 17 | ● |
| 178-P/M/K | 17.8 | 9.9 | 2.74 | 7.16 | 17 | ● |
| 179-P/M/K | 17.9 | 9.9 | 2.75 | 7.15 | 17 | ● |
| 180-P/M/K | 18.0 | 10.5 | 2.73 | 7.77 | 18 | ● |
| 181-P/M/K | 18.1 | 10.5 | 2.75 | 7.75 | 18 | ● |
| 182-P/M/K | 18.2 | 10.5 | 2.77 | 7.73 | 18 | ● |
| 183-P/M/K | 18.3 | 10.5 | 2.78 | 7.72 | 18 | ● |
| 184-P/M/K | 18.4 | 10.5 | 2.80 | 7.70 | 18 | ● |
| 185-P/M/K | 18.5 | 10.5 | 2.82 | 7.68 | 18 | ● |
| 186-P/M/K | 18.6 | 10.5 | 2.84 | 7.66 | 18 | ● |
| 187-P/M/K | 18.7 | 10.5 | 2.86 | 7.64 | 18 | ● |
| 188-P/M/K | 18.8 | 10.5 | 2.88 | 7.62 | 18 | ● |
| 189-P/M/K | 18.9 | 10.5 | 2.89 | 7.61 | 18 | ● |
| 190-P/M/K | 19.0 | 11.0 | 2.88 | 8.12 | 19 | ● |
| 191-P/M/K | 19.1 | 11.0 | 2.90 | 8.10 | 19 | ● |
| 192-P/M/K | 19.2 | 11.0 | 2.92 | 8.08 | 19 | ● |
| 193-P/M/K | 19.3 | 11.0 | 2.93 | 8.07 | 19 | ● |
| 194-P/M/K | 19.4 | 11.0 | 2.95 | 8.05 | 19 | ● |
| 195-P/M/K | 19.5 | 11.0 | 2.97 | 8.03 | 19 | ● |
| 196-P/M/K | 19.6 | 11.0 | 2.99 | 8.01 | 19 | ● |
| 197-P/M/K | 19.7 | 11.0 | 3.01 | 7.99 | 19 | ● |
| 198-P/M/K | 19.8 | 11.0 | 3.03 | 7.97 | 19 | ● |
| 199-P/M/K | 19.9 | 11.0 | 3.04 | 7.96 | 19 | ● |

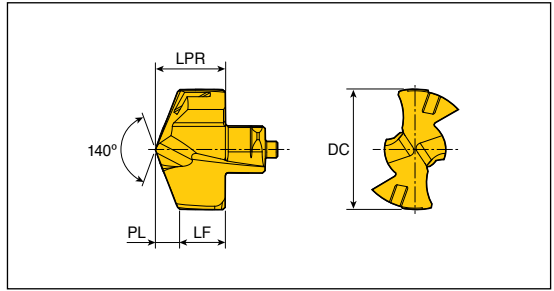


● Drill head can be ordered by an application
 Order example) Diameter 10.0mm drill head for
 ISO P application: TCD-100-P TT9080

●: Standard items

P Steel **M** Stainless steel **K** Cast iron

Drill heads



| Designation | Dimension (mm) | | | | | Grade |
|------------------------|----------------|------|------|------|-----|-------|
| | DC | LPR | PL | LF | SSC | |
| TCD - 200-P/M/K | 20.0 | 11.6 | 3.02 | 8.58 | 20 | ● |
| 201-P/M/K | 20.1 | 11.6 | 3.04 | 8.56 | 20 | ● |
| 202-P/M/K | 20.2 | 11.6 | 3.06 | 8.54 | 20 | ● |
| 203-P/M/K | 20.3 | 11.6 | 3.07 | 8.53 | 20 | ● |
| 204-P/M/K | 20.4 | 11.6 | 3.09 | 8.51 | 20 | ● |
| 205-P/M/K | 20.5 | 11.6 | 3.11 | 8.49 | 20 | ● |
| 206-P/M/K | 20.6 | 11.6 | 3.13 | 8.47 | 20 | ● |
| 207-P/M/K | 20.7 | 11.6 | 3.15 | 8.45 | 20 | ● |
| 208-P/M/K | 20.8 | 11.6 | 3.17 | 8.43 | 20 | ● |
| 209-P/M/K | 20.9 | 11.6 | 3.18 | 8.42 | 20 | ● |
| 210-P/M/K | 21.0 | 12.1 | 3.18 | 8.92 | 21 | ● |
| 211-P/M/K | 21.1 | 12.1 | 3.20 | 8.90 | 21 | ● |
| 212-P/M/K | 21.2 | 12.1 | 3.22 | 8.88 | 21 | ● |
| 213-P/M/K | 21.3 | 12.1 | 3.23 | 8.87 | 21 | ● |
| 214-P/M/K | 21.4 | 12.1 | 3.25 | 8.85 | 21 | ● |
| 215-P/M/K | 21.5 | 12.1 | 3.27 | 8.83 | 21 | ● |
| 216-P/M/K | 21.6 | 12.1 | 3.29 | 8.81 | 21 | ● |
| 217-P/M/K | 21.7 | 12.1 | 3.31 | 8.79 | 21 | ● |
| 218-P/M/K | 21.8 | 12.1 | 3.33 | 8.77 | 21 | ● |
| 219-P/M/K | 21.9 | 12.1 | 3.34 | 8.76 | 21 | ● |
| 220-P/M/K | 22.0 | 12.7 | 3.24 | 9.46 | 22 | ● |
| 221-P/M/K | 22.1 | 12.7 | 3.26 | 9.44 | 22 | ● |
| 222-P/M/K | 22.2 | 12.7 | 3.28 | 9.42 | 22 | ● |
| 223-P/M/K | 22.3 | 12.7 | 3.29 | 9.41 | 22 | ● |
| 224-P/M/K | 22.4 | 12.7 | 3.31 | 9.39 | 22 | ● |
| 225-P/M/K | 22.5 | 12.7 | 3.33 | 9.37 | 22 | ● |
| 226-P/M/K | 22.6 | 12.7 | 3.35 | 9.35 | 22 | ● |
| 227-P/M/K | 22.7 | 12.7 | 3.37 | 9.33 | 22 | ● |
| 228-P/M/K | 22.8 | 12.7 | 3.39 | 9.31 | 22 | ● |
| 229-P/M/K | 22.9 | 12.7 | 3.40 | 9.30 | 22 | ● |
| 230-P/M/K | 23.0 | 13.3 | 3.46 | 9.84 | 23 | ● |
| 231-P/M/K | 23.1 | 13.3 | 3.48 | 9.82 | 23 | ● |
| 232-P/M/K | 23.2 | 13.3 | 3.50 | 9.80 | 23 | ● |
| 233-P/M/K | 23.3 | 13.3 | 3.51 | 9.79 | 23 | ● |
| 234-P/M/K | 23.4 | 13.3 | 3.53 | 9.77 | 23 | ● |



• Drill head can be ordered by an application
 Order example) Diameter 10.0mm drill head for
 ISO P application: TCD-100-P TT9080

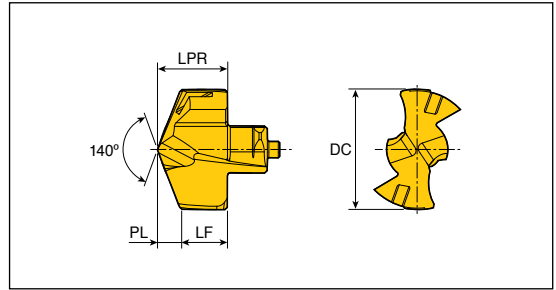
●: Standard items

P Steel **M** Stainless steel **K** Cast iron

TCD...P/M/K



Drill heads



| Designation | Dimension (mm) | | | | | Grade |
|------------------------|----------------|------|------|-------|-----|-------|
| | DC | LPR | PL | LF | SSC | |
| TCD - 235-P/M/K | 23.5 | 13.3 | 3.55 | 9.75 | 23 | ● |
| 236-P/M/K | 23.6 | 13.3 | 3.57 | 9.73 | 23 | ● |
| 237-P/M/K | 23.7 | 13.3 | 3.59 | 9.71 | 23 | ● |
| 238-P/M/K | 23.8 | 13.3 | 3.61 | 9.69 | 23 | ● |
| 239-P/M/K | 23.9 | 13.3 | 3.62 | 9.68 | 23 | ● |
| 240-P/M/K | 24.0 | 13.9 | 3.62 | 10.28 | 24 | ● |
| 241-P/M/K | 24.1 | 13.9 | 3.64 | 10.26 | 24 | ● |
| 242-P/M/K | 24.2 | 13.9 | 3.66 | 10.24 | 24 | ● |
| 243-P/M/K | 24.3 | 13.9 | 3.67 | 10.23 | 24 | ● |
| 244-P/M/K | 24.4 | 13.9 | 3.69 | 10.21 | 24 | ● |
| 245-P/M/K | 24.5 | 13.9 | 3.71 | 10.19 | 24 | ● |
| 246-P/M/K | 24.6 | 13.9 | 3.73 | 10.17 | 24 | ● |
| 247-P/M/K | 24.7 | 13.9 | 3.75 | 10.15 | 24 | ● |
| 248-P/M/K | 24.8 | 13.9 | 3.77 | 10.13 | 24 | ● |
| 249-P/M/K | 24.9 | 13.9 | 3.78 | 10.12 | 24 | ● |
| 250-P/M/K | 25.0 | 14.5 | 3.80 | 10.70 | 25 | ● |
| 251-P/M/K | 25.1 | 14.5 | 3.82 | 10.68 | 25 | ● |
| 252-P/M/K | 25.2 | 14.5 | 3.84 | 10.66 | 25 | ● |
| 253-P/M/K | 25.3 | 14.5 | 3.85 | 10.65 | 25 | ● |
| 254-P/M/K | 25.4 | 14.5 | 3.87 | 10.63 | 25 | ● |
| 255-P/M/K | 25.5 | 14.5 | 3.89 | 10.61 | 25 | ● |
| 256-P/M/K | 25.6 | 14.5 | 3.91 | 10.59 | 25 | ● |
| 257-P/M/K | 25.7 | 14.5 | 3.93 | 10.57 | 25 | ● |
| 258-P/M/K | 25.8 | 14.5 | 3.95 | 10.55 | 25 | ● |
| 259-P/M/K | 25.9 | 14.5 | 3.96 | 10.54 | 25 | ● |
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• Drill head can be ordered by an application
 Order example) Diameter 10.0mm drill head for
 ISO P application: TCD-100-P TT9080

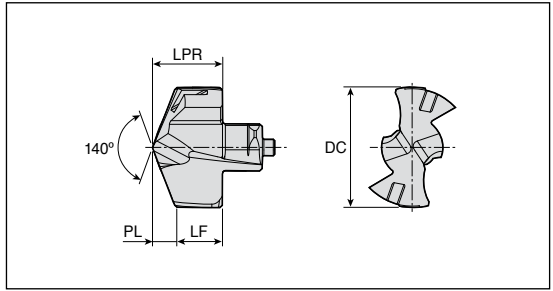
• Standard items

P Steel **M** Stainless steel **K** Cast iron



TCD...N

Drill heads for aluminum alloy



| Designation | Dimension (mm) | | | | | Grade | |
|--------------------|----------------|-------|------|------|-----|-------|--|
| | DC | LPR | PL | LF | SSC | UF10 | |
| TCD - 060-N | 6.0 | 4.00 | 0.96 | 3.04 | 6 | • | |
| 065-N | 6.5 | 4.30 | 1.18 | 3.12 | 6.5 | • | |
| 070-N | 7.0 | 4.60 | 1.01 | 3.59 | 7 | • | |
| 075-N | 7.5 | 4.60 | 1.10 | 3.50 | 7 | • | |
| 080-N | 8.0 | 5.40 | 1.20 | 4.20 | 8 | • | |
| 085-N | 8.5 | 5.40 | 1.29 | 4.11 | 8 | • | |
| 090-N | 9.0 | 5.80 | 1.35 | 4.45 | 9 | • | |
| 095-N | 9.5 | 5.80 | 1.44 | 4.36 | 9 | • | |
| 100-N | 10.0 | 6.20 | 1.50 | 4.70 | 10 | • | |
| 105-N | 10.5 | 6.20 | 1.59 | 4.61 | 10 | • | |
| 110-N | 11.0 | 6.60 | 1.67 | 4.93 | 11 | • | |
| 115-N | 11.5 | 6.60 | 1.76 | 4.84 | 11 | • | |
| 120-N | 12.0 | 7.00 | 1.82 | 5.18 | 12 | • | |
| 125-N | 12.5 | 7.00 | 1.91 | 5.09 | 12 | • | |
| 130-N | 13.0 | 7.60 | 1.96 | 5.64 | 13 | • | |
| 135-N | 13.5 | 7.60 | 2.05 | 5.55 | 13 | • | |
| 140-N | 14.0 | 8.15 | 2.12 | 6.03 | 14 | • | |
| 145-N | 14.5 | 8.15 | 2.21 | 5.94 | 14 | • | |
| 150-N | 15.0 | 8.73 | 2.27 | 6.46 | 15 | • | |
| 155-N | 15.5 | 8.73 | 2.36 | 6.37 | 15 | • | |
| 160-N | 16.0 | 9.30 | 2.42 | 6.88 | 16 | • | |
| 165-N | 16.5 | 9.30 | 2.51 | 6.79 | 16 | • | |
| 170-N | 17.0 | 9.90 | 2.59 | 7.31 | 17 | • | |
| 175-N | 17.5 | 9.90 | 2.68 | 7.22 | 17 | • | |
| 180-N | 18.0 | 10.50 | 2.73 | 7.77 | 18 | • | |
| 185-N | 18.5 | 10.50 | 2.82 | 7.68 | 18 | • | |
| 190-N | 19.0 | 11.00 | 2.88 | 8.12 | 19 | • | |
| 195-N | 19.5 | 11.00 | 2.97 | 8.03 | 19 | • | |
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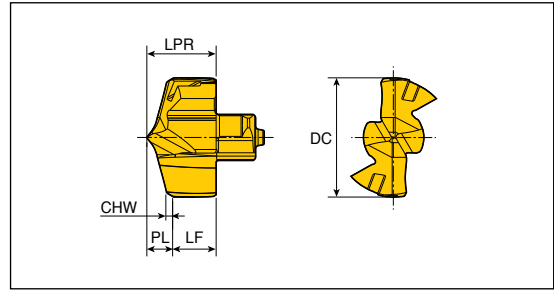


• SSC: Seat size code

•: Standard items



Self-centering drill heads



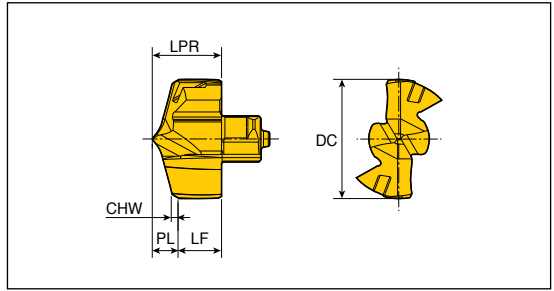
| Designation | Dimension (mm) | | | | | | Grade |
|-------------------|----------------|------|------|------|-----|-----|--------|
| | DC | LPR | PL | LF | CHW | SSC | TT9080 |
| TCD-060-P+ | 6.0 | 4.00 | 1.46 | 2.54 | 0.5 | 6 | ● |
| 065-P+ | 6.5 | 4.30 | 1.55 | 2.75 | 0.5 | 6.5 | ● |
| 068-P+ | 6.8 | 4.30 | 1.59 | 2.71 | 0.5 | 6.5 | ● |
| 070-P+ | 7.0 | 4.60 | 1.64 | 2.96 | 0.5 | 7 | ● |
| 072-P+ | 7.2 | 4.60 | 1.67 | 2.93 | 0.5 | 7 | ● |
| 075-P+ | 7.5 | 4.60 | 1.71 | 2.89 | 0.5 | 7 | ● |
| 080-P+ | 8.0 | 5.40 | 1.81 | 3.59 | 0.5 | 8 | ● |
| 081-P+ | 8.1 | 5.40 | 1.82 | 3.58 | 0.5 | 8 | ● |
| 082-P+ | 8.2 | 5.40 | 1.84 | 3.56 | 0.5 | 8 | ● |
| 083-P+ | 8.3 | 5.40 | 1.85 | 3.55 | 0.5 | 8 | ● |
| 085-P+ | 8.5 | 5.40 | 1.88 | 3.52 | 0.5 | 8 | ● |
| 086-P+ | 8.6 | 5.40 | 1.89 | 3.51 | 0.5 | 8 | ● |
| 087-P+ | 8.7 | 5.40 | 1.90 | 3.50 | 0.5 | 8 | ● |
| 088-P+ | 8.8 | 5.40 | 1.92 | 3.48 | 0.5 | 8 | ● |
| 089-P+ | 8.9 | 5.40 | 1.93 | 3.47 | 0.5 | 8 | ● |
| 090-P+ | 9.0 | 5.80 | 1.98 | 3.82 | 0.5 | 9 | ● |
| 093-P+ | 9.3 | 5.80 | 2.02 | 3.78 | 0.5 | 9 | ● |
| 095-P+ | 9.5 | 5.80 | 2.05 | 3.75 | 0.5 | 9 | ● |
| 096-P+ | 9.6 | 5.80 | 2.06 | 3.74 | 0.5 | 9 | ● |
| 097-P+ | 9.7 | 5.80 | 2.07 | 3.73 | 0.5 | 9 | ● |
| 098-P+ | 9.8 | 5.80 | 2.09 | 3.71 | 0.5 | 9 | ● |
| 099-P+ | 9.9 | 5.80 | 2.10 | 3.70 | 0.5 | 9 | ● |
| 100-P+ | 10.0 | 6.20 | 2.33 | 3.87 | 0.7 | 10 | ● |
| 101-P+ | 10.1 | 6.20 | 2.34 | 3.86 | 0.7 | 10 | ● |
| 102-P+ | 10.2 | 6.20 | 2.36 | 3.84 | 0.7 | 10 | ● |
| 103-P+ | 10.3 | 6.20 | 2.37 | 3.83 | 0.7 | 10 | ● |
| 105-P+ | 10.5 | 6.20 | 2.40 | 3.80 | 0.7 | 10 | ● |
| 106-P+ | 10.6 | 6.20 | 2.41 | 3.79 | 0.7 | 10 | ● |
| 107-P+ | 10.7 | 6.20 | 2.42 | 3.78 | 0.7 | 10 | ● |
| 108-P+ | 10.8 | 6.20 | 2.44 | 3.76 | 0.7 | 10 | ● |
| 109-P+ | 10.9 | 6.20 | 2.45 | 3.75 | 0.7 | 10 | ● |
| 110-P+ | 11.0 | 6.60 | 2.50 | 4.10 | 0.7 | 11 | ● |
| 111-P+ | 11.1 | 6.60 | 2.51 | 4.09 | 0.7 | 11 | ● |
| 112-P+ | 11.2 | 6.60 | 2.53 | 4.07 | 0.7 | 11 | ● |
| 113-P+ | 11.3 | 6.60 | 2.54 | 4.06 | 0.7 | 11 | ● |



● SSC: Seat size code

●: Standard items

Self-centering drill heads



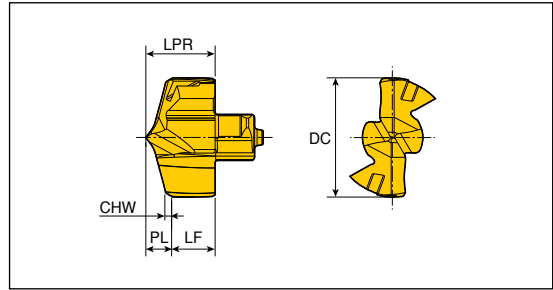
| Designation | Dimension (mm) | | | | | | Grade TT9080 |
|-------------------|----------------|------|------|------|-----|-----|-----------------|
| | DC | LPR | PL | LF | CHW | SSC | |
| TCD-114-P+ | 11.4 | 6.60 | 2.55 | 4.05 | 0.7 | 11 | ● |
| 115-P+ | 11.5 | 6.60 | 2.57 | 4.03 | 0.7 | 11 | ● |
| 116-P+ | 11.6 | 6.60 | 2.58 | 4.02 | 0.7 | 11 | ● |
| 117-P+ | 11.7 | 6.60 | 2.59 | 4.01 | 0.7 | 11 | ● |
| 118-P+ | 11.8 | 6.60 | 2.61 | 3.99 | 0.7 | 11 | ● |
| 119-P+ | 11.9 | 6.60 | 2.62 | 3.98 | 0.7 | 11 | ● |
| 120-P+ | 12.0 | 7.00 | 2.67 | 4.33 | 0.7 | 12 | ● |
| 121-P+ | 12.1 | 7.00 | 2.68 | 4.32 | 0.7 | 12 | ● |
| 122-P+ | 12.2 | 7.00 | 2.70 | 4.30 | 0.7 | 12 | ● |
| 123-P+ | 12.3 | 7.00 | 2.71 | 4.29 | 0.7 | 12 | ● |
| 124-P+ | 12.4 | 7.00 | 2.72 | 4.28 | 0.7 | 12 | ● |
| 125-P+ | 12.5 | 7.00 | 2.74 | 4.26 | 0.7 | 12 | ● |
| 126-P+ | 12.6 | 7.00 | 2.75 | 4.25 | 0.7 | 12 | ● |
| 127-P+ | 12.7 | 7.00 | 2.76 | 4.24 | 0.7 | 12 | ● |
| 128-P+ | 12.8 | 7.00 | 2.78 | 4.22 | 0.7 | 12 | ● |
| 130-P+ | 13.0 | 7.60 | 2.85 | 4.75 | 0.7 | 13 | ● |
| 131-P+ | 13.1 | 7.60 | 2.86 | 4.74 | 0.7 | 13 | ● |
| 132-P+ | 13.2 | 7.60 | 2.88 | 4.72 | 0.7 | 13 | ● |
| 133-P+ | 13.3 | 7.60 | 2.89 | 4.71 | 0.7 | 13 | ● |
| 134-P+ | 13.4 | 7.60 | 2.90 | 4.70 | 0.7 | 13 | ● |
| 135-P+ | 13.5 | 7.60 | 2.92 | 4.68 | 0.7 | 13 | ● |
| 136-P+ | 13.6 | 7.60 | 2.93 | 4.67 | 0.7 | 13 | ● |
| 137-P+ | 13.7 | 7.60 | 2.94 | 4.66 | 0.7 | 13 | ● |
| 138-P+ | 13.8 | 7.60 | 2.96 | 4.64 | 0.7 | 13 | ● |
| 139-P+ | 13.9 | 7.60 | 2.97 | 4.63 | 0.7 | 13 | ● |
| 140-P+ | 14.0 | 8.15 | 3.02 | 5.13 | 0.7 | 14 | ● |
| 141-P+ | 14.1 | 8.15 | 3.03 | 5.12 | 0.7 | 14 | ● |
| 142-P+ | 14.2 | 8.15 | 3.05 | 5.10 | 0.7 | 14 | ● |
| 143-P+ | 14.3 | 8.15 | 3.06 | 5.09 | 0.7 | 14 | ● |
| 144-P+ | 14.4 | 8.15 | 3.07 | 5.08 | 0.7 | 14 | ● |
| 145-P+ | 14.5 | 8.15 | 3.09 | 5.06 | 0.7 | 14 | ● |
| 146-P+ | 14.6 | 8.15 | 3.10 | 5.05 | 0.7 | 14 | ● |
| 147-P+ | 14.7 | 8.15 | 3.11 | 5.04 | 0.7 | 14 | ● |
| 148-P+ | 14.8 | 8.15 | 3.13 | 5.02 | 0.7 | 14 | ● |
| 150-P+ | 15.0 | 8.73 | 3.19 | 5.54 | 0.7 | 15 | ● |



● SSC: Seat size code

●: Standard items

Self-centering drill heads



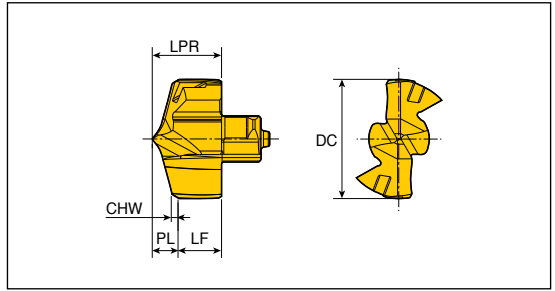
| Designation | Dimension (mm) | | | | | | Grade TT9080 |
|-------------------|----------------|-------|------|------|------|-----|-----------------|
| | DC | LPR | PL | LF | CHW | SSC | |
| TCD-151-P+ | 15.1 | 8.73 | 3.20 | 5.53 | 0.7 | 15 | ● |
| 152-P+ | 15.2 | 8.73 | 3.22 | 5.51 | 0.7 | 15 | ● |
| 153-P+ | 15.3 | 8.73 | 3.23 | 5.50 | 0.7 | 15 | ● |
| 154-P+ | 15.4 | 8.73 | 3.24 | 5.49 | 0.7 | 15 | ● |
| 155-P+ | 15.5 | 8.73 | 3.26 | 5.47 | 0.7 | 15 | ● |
| 156-P+ | 15.6 | 8.73 | 3.27 | 5.46 | 0.7 | 15 | ● |
| 157-P+ | 15.7 | 8.73 | 3.28 | 5.45 | 0.7 | 15 | ● |
| 158-P+ | 15.8 | 8.73 | 3.30 | 5.43 | 0.7 | 15 | ● |
| 159-P+ | 15.9 | 8.73 | 3.31 | 5.42 | 0.7 | 15 | ● |
| 160-P+ | 16.0 | 9.30 | 3.46 | 5.84 | 0.81 | 16 | ● |
| 161-P+ | 16.1 | 9.30 | 3.47 | 5.83 | 0.81 | 16 | ● |
| 162-P+ | 16.2 | 9.30 | 3.49 | 5.81 | 0.81 | 16 | ● |
| 163-P+ | 16.3 | 9.30 | 3.50 | 5.80 | 0.81 | 16 | ● |
| 164-P+ | 16.4 | 9.30 | 3.51 | 5.79 | 0.81 | 16 | ● |
| 165-P+ | 16.5 | 9.30 | 3.53 | 5.77 | 0.81 | 16 | ● |
| 166-P+ | 16.6 | 9.30 | 3.54 | 5.76 | 0.81 | 16 | ● |
| 167-P+ | 16.7 | 9.30 | 3.55 | 5.75 | 0.81 | 16 | ● |
| 168-P+ | 16.8 | 9.30 | 3.57 | 5.73 | 0.81 | 16 | ● |
| 170-P+ | 17.0 | 9.90 | 3.63 | 6.27 | 0.81 | 17 | ● |
| 171-P+ | 17.1 | 9.90 | 3.64 | 6.26 | 0.81 | 17 | ● |
| 172-P+ | 17.2 | 9.90 | 3.66 | 6.24 | 0.81 | 17 | ● |
| 173-P+ | 17.3 | 9.90 | 3.67 | 6.23 | 0.81 | 17 | ● |
| 174-P+ | 17.4 | 9.90 | 3.68 | 6.22 | 0.81 | 17 | ● |
| 175-P+ | 17.5 | 9.90 | 3.70 | 6.20 | 0.81 | 17 | ● |
| 176-P+ | 17.6 | 9.90 | 3.71 | 6.19 | 0.81 | 17 | ● |
| 177-P+ | 17.7 | 9.90 | 3.72 | 6.18 | 0.81 | 17 | ● |
| 178-P+ | 17.8 | 9.90 | 3.74 | 6.16 | 0.81 | 17 | ● |
| 179-P+ | 17.9 | 9.90 | 3.75 | 6.15 | 0.81 | 17 | ● |
| 180-P+ | 18.0 | 10.50 | 3.81 | 6.69 | 0.81 | 18 | ● |
| 181-P+ | 18.1 | 10.50 | 3.82 | 6.68 | 0.81 | 18 | ● |
| 182-P+ | 18.2 | 10.50 | 3.84 | 6.66 | 0.81 | 18 | ● |
| 183-P+ | 18.3 | 10.50 | 3.85 | 6.65 | 0.81 | 18 | ● |
| 185-P+ | 18.5 | 10.50 | 3.88 | 6.62 | 0.81 | 18 | ● |
| 186-P+ | 18.6 | 10.50 | 3.89 | 6.61 | 0.81 | 18 | ● |
| 187-P+ | 18.7 | 10.50 | 3.90 | 6.60 | 0.81 | 18 | ● |



● SSC: Seat size code

●: Standard items

Self-centering drill heads



| Designation | Dimension (mm) | | | | | | Grade TT9080 |
|-------------------|----------------|-------|------|------|------|-----|-----------------|
| | DC | LPR | PL | LF | CHW | SSC | |
| TCD-188-P+ | 18.8 | 10.50 | 3.92 | 6.58 | 0.81 | 18 | ● |
| 190-P+ | 19.0 | 11.00 | 3.98 | 7.02 | 0.81 | 19 | ● |
| 191-P+ | 19.1 | 11.00 | 3.99 | 7.01 | 0.81 | 19 | ● |
| 192-P+ | 19.2 | 11.00 | 4.01 | 6.99 | 0.81 | 19 | ● |
| 193-P+ | 19.3 | 11.00 | 4.02 | 6.98 | 0.81 | 19 | ● |
| 194-P+ | 19.4 | 11.00 | 4.03 | 6.97 | 0.81 | 19 | ● |
| 195-P+ | 19.5 | 11.00 | 4.05 | 6.95 | 0.81 | 19 | ● |
| 196-P+ | 19.6 | 11.00 | 4.06 | 6.94 | 0.81 | 19 | ● |
| 197-P+ | 19.7 | 11.00 | 4.07 | 6.93 | 0.81 | 19 | ● |
| 198-P+ | 19.8 | 11.00 | 4.09 | 6.91 | 0.81 | 19 | ● |
| 199-P+ | 19.9 | 11.00 | 4.10 | 6.90 | 0.81 | 19 | ● |
| 200-P+ | 20.0 | 11.60 | 4.15 | 7.45 | 0.81 | 20 | ● |
| 201-P+ | 20.1 | 11.60 | 4.16 | 7.44 | 0.81 | 20 | ● |
| 202-P+ | 20.2 | 11.60 | 4.18 | 7.42 | 0.81 | 20 | ● |
| 205-P+ | 20.5 | 11.60 | 4.22 | 7.38 | 0.81 | 20 | ● |
| 206-P+ | 20.6 | 11.60 | 4.23 | 7.37 | 0.81 | 20 | ● |
| 207-P+ | 20.7 | 11.60 | 4.24 | 7.36 | 0.81 | 20 | ● |
| 210-P+ | 21.0 | 12.18 | 4.32 | 7.86 | 0.81 | 21 | ● |
| 212-P+ | 21.2 | 12.18 | 4.35 | 7.83 | 0.81 | 21 | ● |
| 213-P+ | 21.3 | 12.18 | 4.36 | 7.82 | 0.81 | 21 | ● |
| 214-P+ | 21.4 | 12.18 | 4.37 | 7.81 | 0.81 | 21 | ● |
| 215-P+ | 21.5 | 12.18 | 4.39 | 7.79 | 0.81 | 21 | ● |
| 218-P+ | 21.8 | 12.18 | 4.43 | 7.75 | 0.81 | 21 | ● |
| 220-P+ | 22.0 | 12.76 | 4.50 | 8.26 | 0.81 | 22 | ● |
| 225-P+ | 22.5 | 12.76 | 4.57 | 8.19 | 0.81 | 22 | ● |
| 229-P+ | 22.9 | 12.76 | 4.62 | 8.14 | 0.81 | 22 | ● |
| 230-P+ | 23.0 | 13.33 | 4.67 | 8.66 | 0.81 | 23 | ● |
| 235-P+ | 23.5 | 13.33 | 4.74 | 8.59 | 0.81 | 23 | ● |
| 240-P+ | 24.0 | 13.90 | 4.84 | 9.06 | 0.81 | 24 | ● |
| 245-P+ | 24.5 | 13.90 | 4.91 | 8.99 | 0.81 | 24 | ● |
| 250-P+ | 25.0 | 14.50 | 5.01 | 9.49 | 0.81 | 25 | ● |
| 254-P+ | 25.4 | 14.50 | 5.06 | 9.44 | 0.81 | 25 | ● |
| 255-P+ | 25.5 | 14.50 | 5.08 | 9.42 | 0.81 | 25 | ● |
| 256-P+ | 25.6 | 14.50 | 5.09 | 9.41 | 0.81 | 25 | ● |
| 257-P+ | 25.7 | 14.50 | 5.10 | 9.40 | 0.81 | 25 | ● |

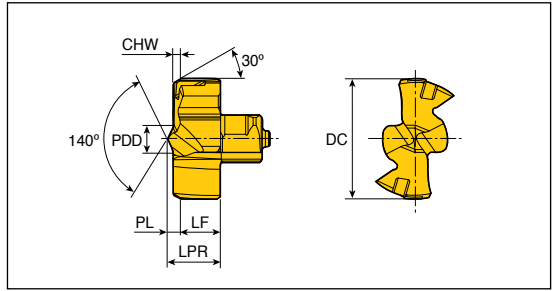
● SSC: Seat size code

●: Standard items



D51

Drill heads for flat bottom hole



| Designation | Dimension (mm) | | | | | | | Grade |
|--------------------|----------------|------|------|------|------|-----|-----|--------|
| | DC | PDD | LPR | PL | LF | CHW | SSC | TT9080 |
| TCD - 080-F | 8.0 | 2.33 | 4.4 | 1.09 | 3.3 | 0.7 | 8 | ● |
| 085-F | 8.5 | 2.33 | 4.4 | 1.09 | 3.3 | 0.7 | 8 | ● |
| 090-F | 9.0 | 2.29 | 4.6 | 1.11 | 3.5 | 0.7 | 9 | ● |
| 095-F | 9.5 | 2.29 | 4.6 | 1.11 | 3.5 | 0.7 | 9 | ● |
| 100-F | 10.0 | 2.44 | 4.9 | 1.17 | 3.7 | 0.7 | 10 | ● |
| 105-F | 10.5 | 2.44 | 4.9 | 1.17 | 3.7 | 0.7 | 10 | ● |
| 110-F | 11.0 | 3.09 | 5.1 | 1.25 | 3.8 | 0.7 | 11 | ● |
| 115-F | 11.5 | 3.09 | 5.1 | 1.25 | 3.8 | 0.7 | 11 | ● |
| 120-F | 12.0 | 2.95 | 5.4 | 1.26 | 4.1 | 0.7 | 12 | ● |
| 125-F | 12.5 | 2.95 | 5.4 | 1.26 | 4.1 | 0.7 | 12 | ● |
| 130-F | 13.0 | 3.04 | 5.7 | 1.30 | 4.4 | 0.7 | 13 | ● |
| 135-F | 13.5 | 3.04 | 5.7 | 1.30 | 4.4 | 0.7 | 13 | ● |
| 140-F | 14.0 | 3.30 | 6.1 | 1.31 | 4.8 | 0.7 | 14 | ● |
| 145-F | 14.5 | 3.30 | 6.1 | 1.31 | 4.8 | 0.7 | 14 | ● |
| 150-F | 15.0 | 3.54 | 6.6 | 1.35 | 5.23 | 0.7 | 15 | ● |
| 155-F | 15.5 | 3.54 | 6.6 | 1.35 | 5.23 | 0.7 | 15 | ● |
| 160-F | 16.0 | 3.74 | 7.0 | 1.39 | 5.6 | 0.7 | 16 | ● |
| 165-F | 16.5 | 3.74 | 7.0 | 1.39 | 5.6 | 0.7 | 16 | ● |
| 170-F | 17.0 | 3.75 | 7.3 | 1.40 | 5.9 | 0.7 | 17 | ● |
| 175-F | 17.5 | 3.75 | 7.3 | 1.40 | 5.9 | 0.7 | 17 | ● |
| 180-F | 18.0 | 3.85 | 7.6 | 1.42 | 6.18 | 0.7 | 18 | ● |
| 185-F | 18.5 | 3.85 | 7.6 | 1.42 | 6.18 | 0.7 | 18 | ● |
| 190-F | 19.0 | 3.86 | 7.9 | 1.44 | 6.5 | 0.7 | 19 | ● |
| 195-F | 19.5 | 3.86 | 7.9 | 1.44 | 6.5 | 0.7 | 19 | ● |
| 200-F | 20.0 | 6.76 | 9.3 | 1.77 | 7.5 | 0.7 | 20 | ● |
| 205-F | 20.5 | 6.76 | 9.3 | 1.77 | 7.5 | 0.7 | 20 | ● |
| 210-F | 21.0 | 6.98 | 9.7 | 1.79 | 7.9 | 0.7 | 21 | ● |
| 215-F | 21.5 | 6.98 | 9.7 | 1.79 | 7.9 | 0.7 | 21 | ● |
| 220-F | 22.0 | 7.42 | 10.0 | 1.81 | 8.2 | 0.7 | 22 | ● |
| 225-F | 22.5 | 7.42 | 10.0 | 1.81 | 8.2 | 0.7 | 22 | ● |
| 230-F | 23.0 | 7.60 | 10.4 | 1.83 | 8.6 | 0.7 | 23 | ● |
| 235-F | 23.5 | 7.60 | 10.4 | 1.83 | 8.6 | 0.7 | 23 | ● |
| 240-F | 24.0 | 8.13 | 10.9 | 1.86 | 9.0 | 0.7 | 24 | ● |
| 245-F | 24.5 | 8.13 | 10.9 | 1.86 | 9.0 | 0.7 | 24 | ● |
| 250-F | 25.0 | 8.16 | 11.3 | 1.89 | 9.4 | 0.7 | 25 | ● |

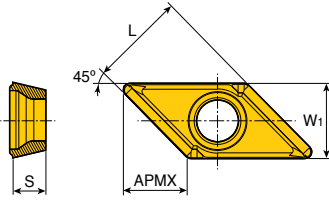


● SSC: Seat size code

●: Standard items

AOMT 060204-C45

Chamfering inserts for pre-thread hole



| Size | Dimension (mm) | | | |
|-----------|----------------|------|------|------|
| | W1 | L | S | APMX |
| 06 | 4.5 | 5.66 | 1.96 | 4.0 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

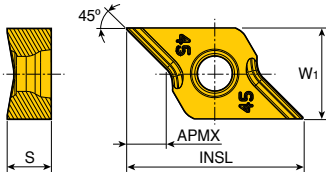
| Insert | Designation | Coated | | | | | | Uncoated | |
|--------|------------------------|--------|--------|--------|--------|--------|--------|----------|--|
| | | TT9080 | TT9030 | TT8020 | TT6030 | TT9300 | TT7400 | | |
| | AOMT 060204-C45 | ● | | | | | | K10 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |



●: Standard items

CRNG 0802-45CD

Chamfering inserts for chamfering ring



| Size | Dimension (mm) | | | |
|-----------|----------------|-------|------|------|
| | W1 | INSL | S | APMX |
| 08 | 7.5 | 14.80 | 3.65 | 3.3 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

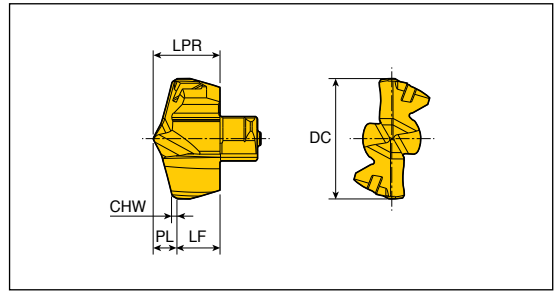
| Insert | Designation | Coated | | | | | | Uncoated | |
|--------|-----------------------|--------|--------|--------|--------|--------|--------|----------|--|
| | | TT9080 | TT9030 | TT8020 | TT6030 | TT9300 | TT7400 | | |
| | CRNG 0802-45CD | ● | | | | | | K10 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |



●: Standard items

TCD...P-CO+

Self-centering drill heads



| Designation | Dimension (mm) | | | | | | Grade |
|----------------------|----------------|-------|------|------|------|-----|--------|
| | DC | LPR | PL | LF | CHW | SSC | TT9080 |
| TCD-159-P-CO+ | 15.9 | 8.73 | 3.17 | 5.56 | 0.7 | 15 | ● |
| 169-P-CO+ | 16.9 | 9.30 | 3.34 | 5.96 | 0.81 | 16 | ● |
| 179-P-CO+ | 17.9 | 9.90 | 3.50 | 6.40 | 0.81 | 17 | ● |
| 189-P-CO+ | 18.9 | 10.50 | 3.66 | 6.84 | 0.81 | 18 | ● |
| 199-P-CO+ | 19.9 | 11.00 | 3.82 | 7.18 | 0.81 | 19 | ● |
| 209-P-CO+ | 20.9 | 11.60 | 3.98 | 7.62 | 0.81 | 20 | ● |
| 219-P-CO+ | 21.9 | 12.18 | 4.15 | 8.03 | 0.81 | 21 | ● |
| 229-P-CO+ | 22.9 | 12.76 | 4.31 | 8.45 | 0.81 | 22 | ● |
| 239-P-CO+ | 23.9 | 13.33 | 4.48 | 8.85 | 0.81 | 23 | ● |
| 249-P-CO+ | 24.9 | 13.90 | 4.64 | 9.26 | 0.81 | 24 | ● |
| 259-P-CO+ | 25.9 | 14.50 | 4.81 | 9.69 | 0.81 | 25 | ● |

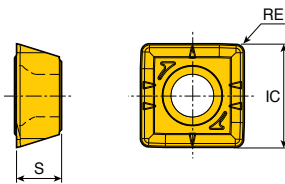


● SSC: Seat size code

● Standard items

SPGX...DW

Inserts



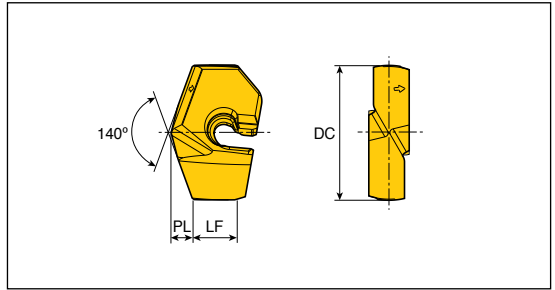
| Size | Dimension (mm) | | | |
|-----------|----------------|------|-----|--|
| | IC | S | RE | |
| 06 | 6.07 | 2.38 | 0.4 | |
| 07 | 8.02 | 3.97 | 0.8 | |
| 09 | 9.91 | 4.30 | 0.8 | |
| 11 | 11.62 | 4.80 | 0.8 | |
| 14 | 14.41 | 5.20 | 1.2 | |
| | | | | |
| | | | | |

| Insert | Designation | Coated | | | | | | Uncoated | |
|--------|-----------------------|--------|--------|--------|--------|--------|--------|----------|--|
| | | TT9080 | TT8020 | TT9900 | TT9030 | TT6080 | TT7400 | K10 | |
| | SPGX 060204 DW | ● | | | | | | | |
| | 07T308 DW | ● | | | | | | | |
| | 090408 DW | ● | | | | | | | |
| | 110408 DW | ● | | | | | | | |
| | 140512 DW | ● | | | | | | | |



● Standard items

Drill heads



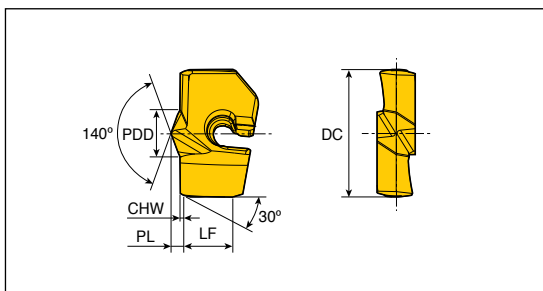
| Designation | Dimension (mm) | | | | Grade |
|-------------------|----------------|------|-------|-----|--------|
| | DC | PL | LF | SSC | TT9080 |
| LCD- 200-P | 20.0 | 3.11 | 6.54 | 20 | ● |
| 205-P | 20.5 | 3.20 | 6.45 | 20 | ● |
| 210-P | 21.0 | 3.29 | 6.36 | 21 | ● |
| 215-P | 21.5 | 3.38 | 6.27 | 21 | ● |
| 220-P | 22.0 | 3.42 | 7.12 | 22 | ● |
| 225-P | 22.5 | 3.51 | 7.03 | 22 | ● |
| 230-P | 23.0 | 3.60 | 6.94 | 23 | ● |
| 235-P | 23.5 | 3.69 | 6.85 | 23 | ● |
| 240-P | 24.0 | 3.73 | 7.03 | 24 | ● |
| 245-P | 24.5 | 3.82 | 6.94 | 24 | ● |
| 250-P | 25.0 | 3.91 | 6.85 | 25 | ● |
| 255-P | 25.5 | 4.00 | 6.76 | 25 | ● |
| 260-P | 26.0 | 4.04 | 7.51 | 26 | ● |
| 265-P | 26.5 | 4.13 | 7.42 | 26 | ● |
| 270-P | 27.0 | 4.22 | 7.33 | 27 | ● |
| 275-P | 27.5 | 4.31 | 7.24 | 27 | ● |
| 280-P | 28.0 | 4.35 | 7.39 | 28 | ● |
| 285-P | 28.5 | 4.44 | 7.30 | 28 | ● |
| 290-P | 29.0 | 4.53 | 7.21 | 29 | ● |
| 295-P | 29.5 | 4.62 | 7.12 | 29 | ● |
| 300-P | 30.0 | 4.67 | 9.47 | 30 | ● |
| 305-P | 30.5 | 4.76 | 9.38 | 30 | ● |
| 310-P | 31.0 | 4.85 | 9.29 | 31 | ● |
| 315-P | 31.5 | 4.94 | 9.20 | 31 | ● |
| 320-P | 32.0 | 4.98 | 9.55 | 32 | ● |
| 325-P | 32.5 | 5.07 | 9.46 | 32 | ● |
| 330-P | 33.0 | 5.16 | 9.37 | 33 | ● |
| 335-P | 33.5 | 5.25 | 9.28 | 33 | ● |
| 340-P | 34.0 | 5.34 | 9.19 | 34 | ● |
| 345-P | 34.5 | 5.44 | 9.10 | 34 | ● |
| 350-P | 35.0 | 5.44 | 11.12 | 35 | ● |
| 355-P | 35.5 | 5.53 | 11.03 | 35 | ● |
| 360-P | 36.0 | 5.62 | 10.94 | 36 | ● |
| 365-P | 36.5 | 5.71 | 10.85 | 36 | ● |
| 370-P | 37.0 | 5.80 | 10.76 | 37 | ● |



● SSC: Seat size code

●: Standard items

Drill heads for flat bottom hole



| Designation | Dimension (mm) | | | | | | Grade |
|--------------------|----------------|------|-------|-----|-----|------|--------|
| | DC | PL | LF | CHW | SSC | PDD | TT9080 |
| LCD - 200-F | 20.0 | 2.18 | 7.63 | 0.7 | 20 | 8.3 | ● |
| 205-F | 20.5 | 2.18 | 7.63 | 0.7 | 20 | 8.3 | ● |
| 210-F | 21.0 | 2.18 | 7.63 | 0.7 | 20 | 8.3 | ● |
| 215-F | 21.5 | 2.18 | 7.63 | 0.7 | 20 | 8.3 | ● |
| 220-F | 22.0 | 2.38 | 8.17 | 0.7 | 22 | 9.0 | ● |
| 225-F | 22.5 | 2.38 | 8.17 | 0.7 | 22 | 9.0 | ● |
| 230-F | 23.0 | 2.38 | 8.17 | 0.7 | 22 | 9.0 | ● |
| 235-F | 23.5 | 2.38 | 8.17 | 0.7 | 22 | 9.0 | ● |
| 240-F | 24.0 | 2.52 | 8.10 | 0.7 | 24 | 10.0 | ● |
| 245-F | 24.5 | 2.52 | 8.10 | 0.7 | 24 | 10.0 | ● |
| 250-F | 25.0 | 2.52 | 8.10 | 0.7 | 24 | 10.0 | ● |
| 255-F | 25.5 | 2.52 | 8.10 | 0.7 | 24 | 10.0 | ● |
| 260-F | 26.0 | 2.48 | 9.84 | 0.7 | 26 | 10.5 | ● |
| 265-F | 26.5 | 2.48 | 9.84 | 0.7 | 26 | 10.5 | ● |
| 270-F | 27.0 | 2.48 | 9.84 | 0.7 | 26 | 10.5 | ● |
| 275-F | 27.5 | 2.48 | 9.84 | 0.7 | 26 | 10.5 | ● |
| 280-F | 28.0 | 2.72 | 9.50 | 0.7 | 28 | 11.6 | ● |
| 285-F | 28.5 | 2.72 | 9.50 | 0.7 | 28 | 11.6 | ● |
| 290-F | 29.0 | 2.72 | 9.50 | 0.7 | 28 | 11.6 | ● |
| 295-F | 29.5 | 2.72 | 9.50 | 0.7 | 28 | 11.6 | ● |
| 300-F | 30.0 | 2.80 | 11.63 | 0.7 | 30 | 12.4 | ● |
| 305-F | 30.5 | 2.80 | 11.63 | 0.7 | 30 | 12.4 | ● |
| 310-F | 31.0 | 2.80 | 11.63 | 0.7 | 30 | 12.4 | ● |
| 315-F | 31.5 | 2.80 | 11.63 | 0.7 | 30 | 12.4 | ● |
| 320-F | 32.0 | 3.13 | 11.59 | 0.7 | 32 | 13.6 | ● |
| 325-F | 32.5 | 3.13 | 11.59 | 0.7 | 32 | 13.6 | ● |
| 330-F | 33.0 | 3.13 | 11.59 | 0.7 | 32 | 13.6 | ● |
| 335-F | 33.5 | 3.13 | 11.59 | 0.7 | 32 | 13.6 | ● |
| 340-F | 34.0 | 3.13 | 11.59 | 0.7 | 32 | 13.6 | ● |
| 345-F | 34.5 | 3.13 | 11.59 | 0.7 | 32 | 13.6 | ● |
| 350-F | 35.0 | 3.31 | 13.20 | 0.7 | 35 | 14.6 | ● |
| 355-F | 35.5 | 3.31 | 13.20 | 0.7 | 35 | 14.6 | ● |
| 360-F | 36.0 | 3.31 | 13.20 | 0.7 | 35 | 14.6 | ● |
| 365-F | 36.5 | 3.31 | 13.20 | 0.7 | 35 | 14.6 | ● |
| 370-F | 37.0 | 3.31 | 13.20 | 0.7 | 35 | 14.6 | ● |



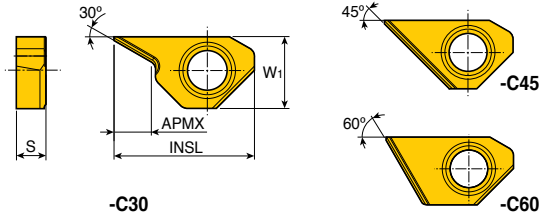
● SSC: Seat size code

●: Standard items




XCGT ...-C



Chamfering inserts for T-CHAMFER holder



| Size | Dimension (mm) | | | |
|---------------|----------------|------|-----|------|
| | W1 | INSL | S | APMX |
| 06-C30 | 6.18 | 12.3 | 2.8 | 3.49 |
| 09-C30 | 8.50 | 16.0 | 3.3 | 4.43 |
| 06-C45 | 6.18 | 12.3 | 2.8 | 5.89 |
| 09-C45 | 8.50 | 16.0 | 3.3 | 8.07 |
| 06-C60 | 6.18 | 12.3 | 2.8 | 3.43 |
| 09-C60 | 8.50 | 16.0 | 3.3 | 4.78 |
| | | | | |
| | | | | |

| Insert | Designation | Coated | | | | | | Uncoated | |
|---|----------------------|--------|--------|--------|--------|--------|--------|----------|-----|
| | | TT9080 | TT9030 | TT8020 | TT6030 | TT9300 | TT7400 | | K10 |
|  | XCGT 0603-C30 | • | | | | | | | |
| | 0903-C30 | • | | | | | | | |
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| | | | | | | | | | |
|  | XCGT 0603-C45 | • | | | | | | | |
| | 0903-C45 | • | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
|  | XCGT 0603-C60 | • | | | | | | | |
| | 0903-C60 | • | | | | | | | |
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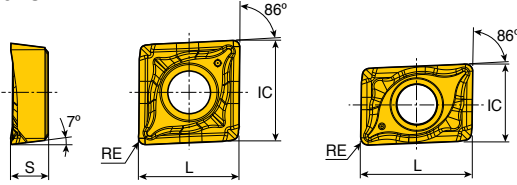
•: Standard items



XCGT...TA



Inserts



XCGT 0401

| Size | Dimension (mm) | | | |
|-----------|----------------|------|------|-----|
| | IC | L | S | RE |
| 04 | 4.4 | 6.4 | 1.70 | 0.4 |
| 05 | 5.6 | 5.6 | 2.10 | 0.4 |
| 06 | 6.4 | 6.4 | 2.38 | 0.4 |
| 07 | 7.5 | 7.5 | 3.18 | 0.4 |
| 08 | 8.4 | 8.4 | 3.18 | 0.4 |
| 10 | 10.5 | 10.5 | 3.97 | 0.4 |
| 13 | 13.4 | 13.4 | 4.76 | 0.4 |
| 17 | 17.5 | 17.5 | 5.56 | 0.8 |

• For aluminum alloy

| Insert | Designation | Turning | | Drilling | Coated | | | | | Uncoated | | |
|-------------------------------------|------------------------|---------|---------------|---------------|--------|--------|--------|--------|--------|----------|-----|--|
| | | ap (mm) | Feed (mm/rev) | Feed (mm/rev) | TT9080 | TT8020 | TT9300 | TT9030 | TT6030 | TT7400 | K10 | |
| <p>Right hand shown (XCGT 0401)</p> | XCGT 040104R TA | 0.2-1.8 | 0.02-0.15 | 0.02-0.09 | | | | | | | • | |
| | 040104L TA | 0.2-1.8 | 0.02-0.15 | 0.02-0.09 | | | | | | | • | |
| | 050204 TA | 0.2-2.2 | 0.03-0.18 | 0.02-0.11 | | | | | | | • | |
| | 060204 TA | 0.3-2.5 | 0.03-0.20 | 0.03-0.12 | | | | | | | • | |
| | 070304 TA | 0.4-2.8 | 0.05-0.22 | 0.03-0.13 | | | | | | | • | |
| | 080304 TA | 0.4-3.2 | 0.06-0.25 | 0.03-0.13 | | | | | | | • | |
| | 10T304 TA | 0.5-3.5 | 0.06-0.30 | 0.03-0.13 | | | | | | | • | |
| | 130404 TA | 0.6-4.3 | 0.08-0.33 | 0.03-0.13 | | | | | | | • | |
| | 170508 TA | 0.7-5.3 | 0.10-0.38 | 0.03-0.13 | | | | | | | • | |

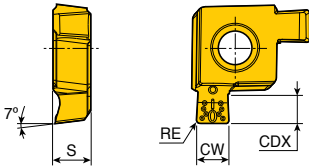
• Standard items



XCMT..R-GV



Inserts



| Size | Dimension (mm) | | | |
|-----------|----------------|-----|------|-----|
| | CW | CDX | S | RE |
| 05 | 2.0 | 1.8 | 2.28 | 0.2 |
| 06 | 2.0 | 2.0 | 2.65 | 0.2 |
| 07 | 2.5 | 2.0 | 3.41 | 0.2 |
| 08 | 2.5 | 2.5 | 3.50 | 0.2 |
| 10 | 3.0 | 3.0 | 4.34 | 0.3 |
| 13 | 3.5 | 3.5 | 5.18 | 0.3 |
| 17 | 4.0 | 4.0 | 6.00 | 0.4 |

• For grooving

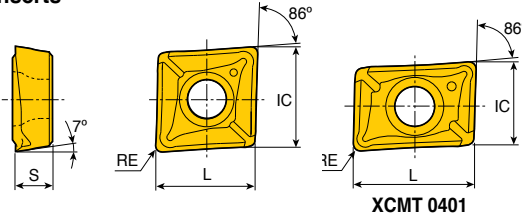
| Insert | Designation | Coated | | | | | | Uncoated | |
|---------------------|--------------------------|--------|--------|--------|--------|--------|--------|----------|--|
| | | TT9080 | TT8020 | TT9300 | TT9030 | TT6030 | TT7400 | K10 | |
| | XCMT 05R-200020GV | • | • | | | | | | |
| | 06R-200020GV | • | • | | | | | | |
| | 07R-250020GV | • | • | | | | | | |
| | 08R-250020GV | • | • | | | | | | |
| | 10R-300030GV | • | • | | | | | | |
| | 13R-350030GV | • | • | | | | | | |
| 17R-400040GV | • | • | | | | | | | |

• Grooving insert is available only for right handed type

• Standard items



Inserts



| Size | Dimension (mm) | | | |
|-----------|----------------|------|------|---------|
| | IC | L | S | RE |
| 04 | 4.4 | 6.4 | 1.70 | 0.4 |
| 05 | 5.6 | 5.6 | 2.10 | 0.4 |
| 06 | 6.4 | 6.4 | 2.38 | 0.4 |
| 07 | 7.5 | 7.5 | 3.18 | 0.4 |
| 08 | 8.4 | 8.4 | 3.18 | 0.4 |
| 10 | 10.5 | 10.5 | 3.97 | 0.4/0.8 |
| 13 | 13.4 | 13.4 | 4.76 | 0.4/0.8 |
| 17 | 17.4 | 17.4 | 5.56 | 0.8 |

- For drilling, boring and turning

| Insert | Designation | Turning | | Drilling | Coated | | | | | | Uncoated | | |
|----------------------------------|------------------------|---------|---------------|---------------|--------|--------|--------|--------|--------|--------|----------|--|--|
| | | ap (mm) | Feed (mm/rev) | Feed (mm/rev) | TT9080 | TT8020 | TT9300 | TT9030 | TT6030 | TT7400 | K10 | | |
| Right hand shown (XCMT 0401) | XCMT 040104R TC | 0.2-1.8 | 0.02-0.15 | 0.02-0.09 | ● | ● | | ● | | | | | |
| | 040104L TC | 0.2-1.8 | 0.02-0.15 | 0.02-0.09 | ● | ● | | ● | | | | | |
| | 050204 TC | 0.2-2.2 | 0.03-0.18 | 0.02-0.11 | ● | ● | | ● | | | | | |
| | 060204 TC | 0.3-2.5 | 0.03-0.20 | 0.03-0.12 | ● | ● | | ● | | | | | |
| | 070304 TC | 0.4-2.8 | 0.05-0.22 | 0.03-0.13 | ● | ● | | ● | | | | | |
| | 080304 TC | 0.4-3.2 | 0.06-0.25 | 0.03-0.13 | ● | ● | | ● | | | | | |
| | 10T304 TC | 0.5-3.5 | 0.06-0.30 | 0.03-0.13 | ● | ● | | ● | | | | | |
| | 10T308 TC | 0.5-3.5 | 0.06-0.30 | 0.03-0.13 | ● | ● | | ● | | | | | |
| | 130404 TC | 0.6-4.3 | 0.08-0.33 | 0.03-0.13 | ● | ● | | ● | | | | | |
| | 130408 TC | 0.6-4.3 | 0.08-0.33 | 0.03-0.13 | ● | ● | | ● | | | | | |
| | 170508 TC | 0.7-5.3 | 0.10-0.38 | 0.03-0.13 | ● | ● | | ● | | | | | |
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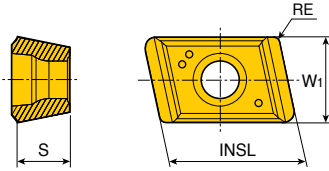
●: Standard items



NPHT...R-G-P/R-HF-P



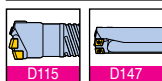
Inserts for TBTA-FB & TRGD



| Size | Dimension (mm) | | | |
|-----------|----------------|------|-----|---------|
| | W ₁ | INSL | S | RE |
| 06 | 6.0 | 8 | 3.0 | 0.4/0.8 |
| 08 | 7.5 | 10 | 4.0 | 0.4/0.8 |
| 09 | 9.0 | 10 | 4.0 | 0.4/0.8 |
| 11 | 11.0 | 10 | 4.0 | 0.4/0.8 |
| 13 | 13.0 | 10 | 4.0 | 0.4/0.8 |
| | | | | |
| | | | | |

| Insert | Designation | Pocket | | | Coated | | | | | | Uncoated | | | |
|--------|-------------------------|--------|-------|-------|--------|--------|--------|--------|--------|--------|----------|--------|-----|--|
| | | Center | Inner | Outer | TT9030 | TT9130 | TT8125 | TT7200 | TT6130 | TT6020 | TT5100 | TT5030 | K10 | |
| | NPHT 060304R-G-P | | | ● | ● | | | | ● | | | ● | | |
| | 060308R-G-P | | | ● | ● | ● | | | ● | | | ● | | |
| | 060308R-HF-P | | | ● | ● | ● | | | ● | | | ● | | |
| | 080404R-G-P | | | ● | ● | | | | ● | | | ● | | |
| | 080408R-G-P | | | ● | ● | ● | | | ● | | | ● | | |
| | 080408R-HF-P | | | ● | ● | ● | | | ● | | | ● | | |
| | 090404R-G-P | | | ● | ● | | | | ● | | | ● | | |
| | 090408R-G-P | | | ● | ● | ● | | | ● | | | ● | | |
| | 090408R-HF-P | | | ● | ● | ● | | | ● | | | ● | | |
| | 110404R-G-P | | | ● | ● | | | | ● | | | ● | | |
| | 110408R-G-P | | | ● | ● | ● | | | ● | | | ● | | |
| | 110408R-HF-P | | | ● | ● | ● | | | ● | | | ● | | |
| | 130404R-G-P | | | ● | ● | | | | ● | | | ● | | |
| | 130408R-G-P | | | ● | ● | ● | | | ● | | | ● | | |
| | 130404R-HF-P | | | ● | ● | ● | | | ● | | | ● | | |
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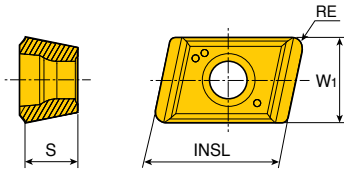
●: Standard items



NPMT...L-G-C/L-HF-C



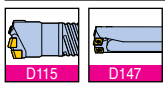
Inserts for TBTA-FB & TRGD



| Size | Dimension (mm) | | | |
|------|----------------|------|-----|-----|
| | W1 | INSL | S | RE |
| 06 | 5.5 | 8 | 3.0 | 0.8 |
| 07 | 6.5 | 10 | 4.0 | 0.8 |
| 08 | 8.0 | 10 | 4.0 | 0.8 |
| 10 | 10.0 | 10 | 4.0 | 0.8 |
| 13 | 12.5 | 10 | 4.0 | 0.8 |
| | | | | |
| | | | | |
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| Insert | Designation | Pocket | | | Coated | | | | | | Uncoated | | | |
|--------|------------------|--------|-------|-------|--------|--------|--------|--------|--------|--------|----------|--------|-----|--|
| | | Center | Inner | Outer | TT9030 | TT9130 | TT8125 | TT7200 | TT6130 | TT6020 | TT5100 | TT5030 | K10 | |
| | NPMT 060308L-G-C | ● | | | ● | ● | ● | ● | | | ● | | | |
| | 060308L-HF-C | ● | | | ● | ● | ● | ● | | | ● | | | |
| | 070408L-G-C | ● | | | ● | ● | ● | ● | | | ● | | | |
| | 070408L-HF-C | ● | | | ● | ● | ● | ● | | | ● | | | |
| | 080408L-G-C | ● | | | ● | ● | ● | ● | | | ● | | | |
| | 080408L-HF-C | ● | | | ● | ● | ● | ● | | | ● | | | |
| | 100408L-G-C | ● | | | ● | ● | ● | ● | | | ● | | | |
| | 100408L-HF-C | ● | | | ● | ● | ● | ● | | | ● | | | |
| | 130408L-G-C | ● | | | ● | ● | ● | ● | | | ● | | | |
| | 130408L-HF-C | ● | | | ● | ● | ● | ● | | | ● | | | |
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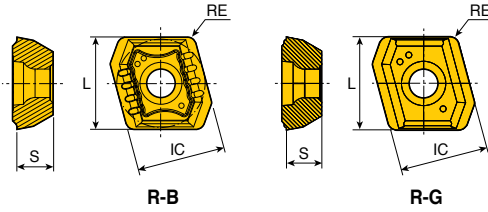
●: Standard items



NPMX...R-B/R-G



Inserts for TBTA...3/5/7/9



| Size | Dimension (mm) | | | |
|-----------|----------------|------|------|-----|
| | IC | L | S | RE |
| 08 | 8.0 | 8.36 | 3.18 | 0.8 |
| | | | | |
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| Insert | Designation | Pocket | | | Coated | | | | | | Uncoated | | |
|--------|-----------------------|--------|-------|-------|--------|--------|--------|--------|--------|--------|----------|-----|--|
| | | Center | Inner | Outer | TT9030 | TT8125 | TT7200 | TT6130 | TT6020 | TT5100 | TT5030 | K10 | |
| | NPMX 080308R-B | ● | ● | ● | ● | ● | | ● | | | | | |
| | 080308R-G | ● | ● | ● | ● | ● | | | ● | ● | | | |
| | | | | | | | | | | | | | |

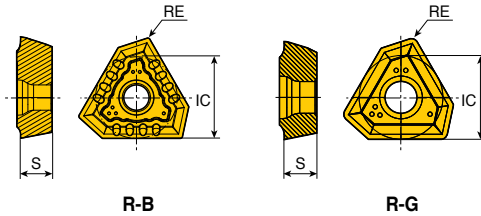


●: Standard items

TPMX...R-B/R-G



Inserts for TBTA...3/5/7/9 & TBTA-R



| Size | Dimension (mm) | | | |
|-----------------------|----------------|-----|-----|--|
| | IC | S | RE | |
| 140304 R-B | 8.45 | 3.5 | 0.4 | |
| 140308 R-B/R-G | 8.45 | 3.5 | 0.8 | |
| 170404 R-B | 10.30 | 4.0 | 0.4 | |
| 170408 R-B/R-G | 10.30 | 4.0 | 0.8 | |
| 240504 R-B | 14.20 | 5.5 | 0.4 | |
| 240512 R-B/R-G | 14.20 | 5.5 | 1.2 | |
| 280708 R-B | 17.00 | 7.5 | 0.8 | |
| 280716 R-B/R-G | 17.00 | 7.5 | 1.6 | |

| Insert | Designation | Pocket | | | Coated | | | | | | Uncoated | | |
|------------------|-----------------------|--------|-------|-------|--------|--------|--------|--------|--------|--------|----------|--------|-----|
| | | Center | Inner | Outer | TT9030 | TT9130 | TT8125 | TT7200 | TT6130 | TT6020 | TT5100 | TT5030 | K10 |
| | TPMX 140304R-B | ● | ● | ● | ● | | ● | | ● | | | | |
| | 140308R-B | ● | ● | ● | | ● | | | | | ● | | |
| | 140308R-G | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | |
| | 170404R-B | ● | ● | ● | ● | | ● | | ● | | | | |
| | 170408R-B | ● | ● | ● | | ● | | | | | | ● | |
| | 170408R-G | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | |
| | 240504R-B | ● | ● | ● | ● | | | | ● | | | | |
| | 240512R-B | ● | ● | ● | | ● | | | | | | ● | |
| | 240512R-G | ● | ● | ● | ● | ● | ● | | | ● | ● | ● | |
| | 280708R-B | ● | ● | ● | ● | | | | ● | | | | |
| 280716R-B | ● | ● | ● | | ● | | | | | | ● | | |
| 280716R-G | ● | ● | ● | ● | ● | ● | ● | | ● | ● | ● | | |



●: Standard items

TOGT...RS/GF



Inserts for TBTA-TR & TRGD

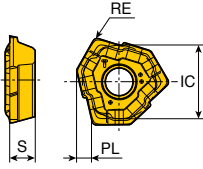


Fig.1

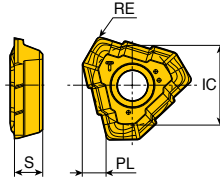


Fig.2

| Size | Dimension (mm) | | | |
|------|----------------|-----|-----|-----|
| | IC | PL | S | RE |
| 07 | 7.69 | 2.0 | 2.3 | 0.4 |
| 08 | 8.32 | 2.2 | 2.8 | 0.5 |
| 09 | 8.55 | 3.0 | 3.0 | 0.5 |
| 10 | 9.23 | 3.2 | 3.3 | 0.5 |
| 11 | 10.40 | 3.4 | 3.8 | 0.5 |
| 12 | 11.59 | 3.7 | 4.3 | 0.5 |
| 13 | 12.85 | 4.6 | 4.8 | 0.8 |
| 14 | 16.85 | 5.4 | 5.3 | 1.0 |

| Insert | Designation | Fig. | Coated | | | | | | Uncoated | | |
|--------|-----------------------|------|--------|--------|--------|--------|--------|--------|----------|-----|--|
| | | | TT9030 | TT8125 | TT7200 | TT6130 | TT6020 | TT5100 | TT5030 | K10 | |
| | TOGT 070304 RS | 1 | ● | | | | | | | | |
| | 070304 GF | 1 | ● | | | | | | | | |
| | 080305 RS | 1 | ● | | | | | | | | |
| | 080305 GF | 1 | ● | | | | | | | | |
| | 090305 RS | 2 | ● | | | | | | | | |
| | 090305 GF | 2 | ● | | | | | | | | |
| | 100305 RS | 2 | ● | | | | | | | | |
| | 100305 GF | 2 | ● | | | | | | | | |
| | 110405 RS | 2 | ● | | | | | | | | |
| | 110405 GF | 2 | ● | | | | | | | | |
| | 120405 RS | 2 | ● | | | | | | | | |
| | 120405 GF | 2 | ● | | | | | | | | |
| | 130408 RS | 2 | ● | | | | | | | | |
| | 130408 GF | 2 | ● | | | | | | | | |
| | 140510 RS | 2 | ● | | | | | | | | |
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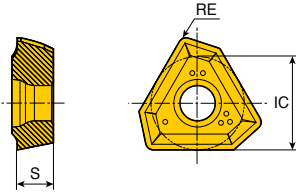
- RS: First choice for general purpose
- GF: Exotic materials

●: Standard items

TPMX...LG



Inserts for TBTA-R



| Size | Dimension (mm) | | |
|-----------|----------------|-----|-----|
| | IC | S | RE |
| 14 | 8.45 | 3.5 | 0.8 |
| 17 | 10.30 | 4.0 | 0.8 |
| 24 | 14.20 | 5.5 | 1.2 |
| | | | |
| | | | |
| | | | |
| | | | |

| Insert | Designation | Pocket | | | Coated | | | | | | Uncoated | | | |
|--------|-----------------------|--------|-------|-------|--------|--------|--------|--------|--------|--------|----------|--------|-----|--|
| | | Center | Inner | Outer | TT9030 | TT9130 | TT8125 | TT7200 | TT6130 | TT6020 | TT5100 | TT5030 | K10 | |
| | TPMX 140308 LG | | | • | • | | | | | | • | | | |
| | 170408 LG | | | • | • | • | | | | • | • | | | |
| | 240512 LG | | | • | • | • | | | | • | • | | | |
| | | | | | | | | | | | | | | |

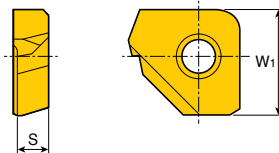


•: Standard items

XPMT...-45



Inserts for TBTA-R



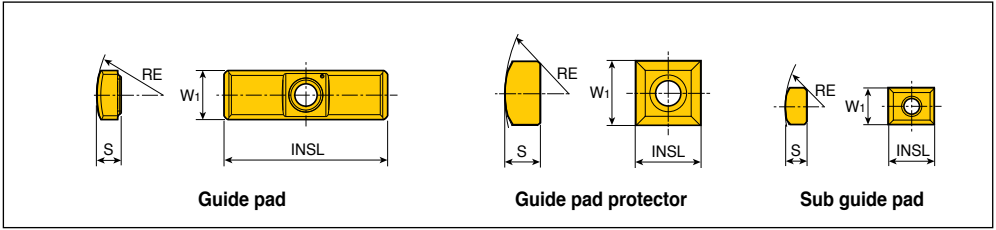
| Size | Dimension (mm) | |
|-----------|----------------|------|
| | W1 | S |
| 16 | 9.5 | 2.70 |
| | | |
| | | |
| | | |
| | | |

| Insert | Designation | Pocket | | | Coated | | | | | | Uncoated | | |
|--------|----------------------|--------|-------|-------|--------|--------|--------|--------|--------|--------|----------|-----|--|
| | | Center | Inner | Outer | TT9030 | TT8125 | TT7100 | TT3500 | TT6020 | TT9300 | TT7400 | K10 | |
| | XPMT 16002-45 | | | • | • | | | | | | | | |
| | | | | | | | | | | | | | |
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•: Standard items

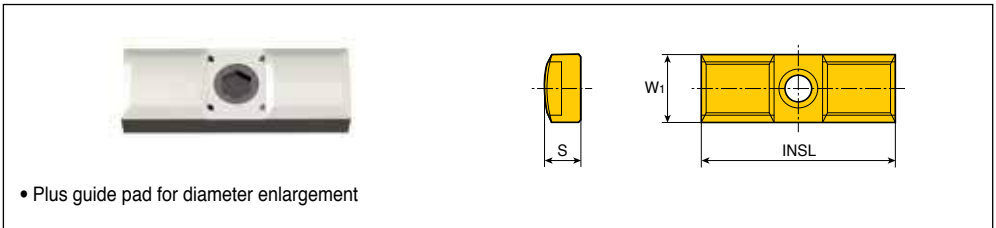
Pad for TBTA 3.../5.../7.../9...



| Designation | | Dimension (mm) | | | | Screw |
|---------------------|--------------------------------|----------------|-----|------|------|---------|
| | | W ₁ | S | INSL | RE | |
| Guide pad | PAD - GP08-25-155-DC-SB | 8 | 4.5 | 25 | 15.5 | CSTB3S |
| | GP08-25-155-DC-SC | 8 | 4.5 | 25 | 15.5 | CSTB3S |
| | GP10-35-200-DC-SB | 10 | 6.0 | 35 | 20.0 | CSTB4S |
| | GP10-35-200-DC-SC | 10 | 6.0 | 35 | 20.0 | CSTB4S |
| | GP14-40-250-DC-SB/SC | 14 | 7.5 | 40 | 25.0 | CSTA5S |
| | GP18-40-300-DC-SB/SC | 18 | 9.0 | 40 | 30.0 | LS1206S |
| Guide pad protector | PAD - P08 | 8 | 4.5 | 8 | 17.5 | CSTB3S |
| | P10 | 10 | 6.0 | 10 | 20.0 | CSTB4S |
| | P14 | 14 | 7.5 | 14 | 25.0 | CSTA5S |
| | P18 | 18 | 9.0 | 18 | 30.0 | LS1206S |
| | PAD - S08 | 8 | 4.5 | 10 | 17.5 | CSTB3S |
| Sub guide pad | S10 | 10 | 5.0 | 10 | 29.0 | CSTB3S |
| | S14 | 14 | 7.0 | 20 | 45.0 | CCSTA5S |

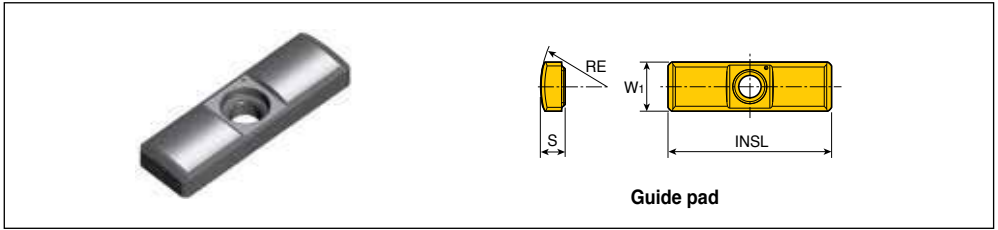


Plus Guide Pad for TBTA 3.../5.../7.../9...



| Designation | | | | | | | | | | |
|-----------------|-------------------|-----|-------------------|-----|-------------------|------|-------------------|------|-------------------|------|
| DC | DC+1mm | S | DC+2mm | S | DC+3mm | S | DC+4mm | S | DC+5mm | S |
| PAD-GC08 | PAD-GC08+1 | 5.0 | PAD-GC08+2 | 5.5 | PAD-GC08+3 | 6.0 | - | - | - | - |
| PAD-GC10 | PAD-GC10+1 | 6.5 | PAD-GC10+2 | 7.0 | PAD-GC10+3 | 7.5 | PAD-GC10+4 | 8.0 | - | - |
| PAD-GC14 | PAD-GC14+1 | 8.0 | PAD-GC14+2 | 8.5 | PAD-GC14+3 | 9.0 | PAD-GC14+4 | 9.5 | PAD-GC14+5 | 10.0 |
| PAD-GC18 | PAD-GC18+1 | 9.5 | PAD-GC18+2 | 10 | PAD-GC18+3 | 10.5 | PAD-GC18+4 | 11.0 | PAD-GC18+5 | 11.5 |



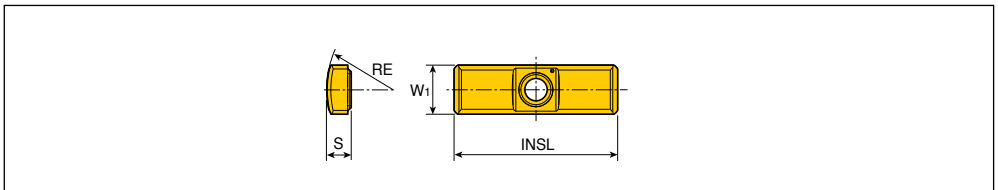


| Designation | Dimension (mm) | | | | Screw | |
|-------------|--------------------------------|----|------|----|-------|----------|
| | W1 | S | INSL | RE | | |
| Guide pad | PAD - GP06-20-120-DC-SB | 6 | 3.0 | 20 | 12.0 | CSTB2.2S |
| | GP06-20-120-DC-SC | 6 | 3.0 | 20 | 12.0 | CSTB2.2S |
| | GP07-20-120-DC-SB | 7 | 3.5 | 20 | 12.0 | CSTB3S |
| | GP07-20-120-DC-SC | 7 | 3.5 | 20 | 12.0 | CSTB3S |
| | GP08-25-155-DC-SB | 8 | 4.5 | 25 | 15.5 | CSTB3S |
| | GP08-25-155-DC-SC | 8 | 4.5 | 25 | 15.5 | CSTB3S |
| | GP10-30-200-DC-SB | 10 | 4.5 | 30 | 20.0 | CSTB3.5 |
| | GP10-30-200-DC-SC | 10 | 4.5 | 30 | 20.0 | CSTB3.5 |
| | GP12-35-250-DC-SB | 12 | 5.5 | 35 | 25.0 | CSTB3.5 |
| | GP12-35-250-DC-SC | 12 | 5.5 | 35 | 25.0 | CSTB3.5 |



Pad for TBTA-TR & TRGD

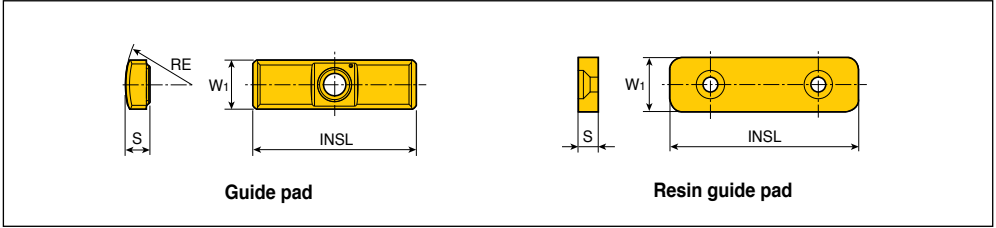
Solid carbide guide pads



| Designation | Dimension (mm) | | | | Screw | |
|-------------|--------------------------------|---|------|----|-------|----------------------|
| | W1 | S | INSL | RE | | |
| Guide pad | PAD - GP05-18-060-DC-SB | 5 | 2.5 | 18 | 6.0 | SR34-508 |
| | GP05-18-060-DC-SC | 5 | 2.5 | 18 | 6.0 | SR34-508 |
| | GP05-18-075-DC-SB | 5 | 2.5 | 18 | 7.5 | SR34-508 |
| | GP05-18-075-DC-SC | 5 | 2.5 | 18 | 7.5 | SR34-508 |
| | GP06-20-085-DC-SB | 6 | 3.0 | 20 | 8.5 | CSTB2.2S* / SR34-508 |
| | GP06-20-085-DC-SC | 6 | 3.0 | 20 | 8.5 | CSTB2.2S* / SR34-508 |
| | GP06-20-100-DC-SB | 6 | 3.0 | 20 | 10.0 | CSTB2.2S* / SR34-508 |
| | GP06-20-100-DC-SC | 6 | 3.0 | 20 | 10.0 | CSTB2.2S* / SR34-508 |
| | GP06-20-120-DC-SB | 6 | 3.0 | 20 | 12.0 | CSTB2.2S* / SR34-508 |
| | GP06-20-120-DC-SC | 6 | 3.0 | 20 | 12.0 | CSTB2.2S* / SR34-508 |



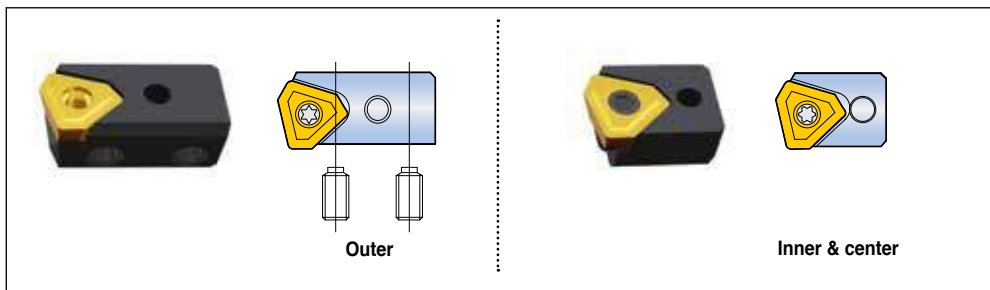
- Guide pad with "SB" is the first choice in general purpose machining.
- "SC" is an excellent toughness grade used with water-soluble coolant.



| | Designation | Dimension (mm) | | | | Screw |
|-----------------|--------------------------|----------------|------|------|------|------------|
| | | W1 | S | INSL | RE | |
| Guide pad | PAD - GC08-120 | 8 | 4.4 | 25 | 17.5 | CSTB3S |
| | GC08-140 | 8 | 3.5 | 25 | 17.5 | CSTB3S |
| | GP08-25-155-DC-SB | 8 | 4.5 | 25 | 15.5 | CSTB3S |
| | GP08-25-155-DC-SC | 8 | 4.5 | 25 | 15.5 | CSTB3S |
| | GP10-35-200-DC-SB | 10 | 6.0 | 35 | 20.0 | CSTB4S |
| | GP10-35-200-DC-SC | 10 | 6.0 | 35 | 20.0 | CSTB4S |
| | GP14-40-250-DC-SB | 14 | 7.5 | 40 | 25.0 | CSTA5S |
| | GP14-40-250-DC-SC | 14 | 7.5 | 40 | 25.0 | CSTA5S |
| | GP18-40-300-DC-SB | 18 | 9.0 | 40 | 30.0 | LS1206S |
| | GP18-40-300-DC-SC | 18 | 9.0 | 40 | 30.0 | LS1206S |
| Resin guide pad | PAD - R10 | 10 | 4.0 | 40 | - | LS0902.5-6 |
| | R12 | 12 | 5.0 | 45 | - | LS0903-8 |
| | R15 | 15 | 5.8 | 50 | - | LS0904-10 |
| | R20 | 20 | 7.5 | 70 | - | LS0905-12 |
| | R30 | 30 | 12.5 | 80 | - | LS0906-15 |
| | R35 | 35 | 15.5 | 100 | - | LS0906-15 |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |



Cartridge for TBTA 3.../5.../7.../9



| | Designation | Adjust screw | Wrench | Lock screw | Wrench | Insert |
|----------------|-----------------|--------------|--------|------------|--------|------------|
| Outer | PERC 05R | AS0003-5 | H1.5 | LS1803RH | H2 | NPMX0803.. |
| | 402-04 | AS0004-8 | H2 | LS1803.5RH | H2.5 | TPMX1403.. |
| | 402-32 | AS0005-10 | H2.5 | LS1805RH | H3 | TPMX1704.. |
| | 402-43 | AS0005-15 | H2.5 | L1806RH | H4 | TPMX2405.. |
| | 402-63 | AS0006-15 | H3 | L1806RH | H4 | TPMX2807.. |
| Inner & center | CENC 05R | - | - | CSTB3 | T9 | NPMX0803.. |
| | 402-04 | - | - | CSTB3.5 | T15 | TPMX1403.. |
| | 402-32 | - | - | CSTA5 | T15 | TPMX1704.. |
| | 402-43 | - | - | LS1206 | H3 | TPMX2405.. |
| | 402-63 | - | - | LS1206 | H3 | TPMX2807.. |



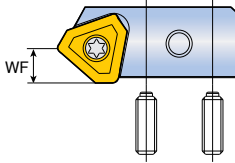
Plus Cartridge for TBTA 3.../5.../7.../9



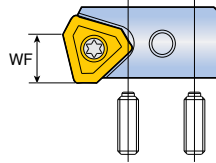
| Designation | | | | | |
|--------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| DC | DC+1mm | DC+2mm | DC+3mm | DC+4mm | DC+5mm |
| PERC 05R | PERC 05R+1 | PERC 05R+2 | - | - | - |
| PERC 402-04 | PERC 402-04+1 | PERC 402-04+2 | PERC 402-04+3 | - | - |
| PERC 402-32 | PERC 402-32+1 | PERC 402-32+2 | PERC 402-32+3 | PERC 402-32+4 | - |
| PERC 402-43 | PERC 402-43+1 | PERC 402-43+2 | PERC 402-43+3 | PERC 402-43+4 | PERC 402-43+5 |
| PERC 402-63 | PERC 402-63+1 | PERC 402-63+2 | PERC 402-63+3 | PERC 402-63+4 | PERC 402-63+5 |



Cartridge for TBTA-R



Accurate tolerance applications



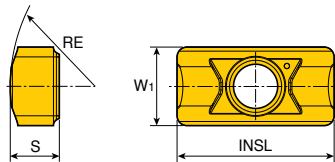
Open tolerance applications

| Designation | | WF (mm) | Adjust screw | Wrench | Lock screw | Wrench | Insert |
|---------------------------------|--------------------|---------|--------------|--------|------------|--------|--------------|
| Accurate tolerance applications | PERC P04R | 5 | AS0004-8 | H2 | LS1803.5RH | H2.5 | TPMX1403..LG |
| | P32R | 6 | AS0005-10 | H2.5 | LS1805RH | H3 | TPMX1704..LG |
| | P43R | 8 | AS0005-15 | H2.5 | LS1806RH | H4 | TPMX2405..LG |
| Open tolerance applications | PERC 402-04 | 8 | AS0004-8 | H2 | LS1803.5RH | H2.5 | TPMX1403..RG |
| | 402-32 | 9 | AS0005-10 | H2.5 | LS1805RH | H3 | TPMX1704..RG |
| | 402-43 | 13 | AS0005-15 | H2.5 | LS1806RH | H4 | TPMX2405..RG |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |



• PERC-P and PERC 402-□□ cartridges are interchangeable in the same pocket

Guide pad for TNDH-TP



| Designation | Dimension (mm) | | | | Screw | Grade TT9030 |
|-------------------|----------------|-----|------|----|----------------|-----------------|
| | W1 | S | INSL | RE | | |
| PAD-G04-08 | 4 | 2.5 | 8 | 9 | TS 20043I/HG-P | ● |
| | | | | | | |
| | | | | | | |
| | | | | | | |



• Guide pad is sold separately from drill body.

• Standard items

Recommended Cutting Conditions

Machining data for TOP-DRILL 2,3,4xD

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | |
|-----------|--|------------------------|---------------------------------------|-------------|--------------|--------------------------|---------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 | 220-350 |
| | | >=0.25%C | Annealed | 650 | 190 | 2 | 180-280 |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 | 140-240 |
| | | >=0.55%C | Annealed | 750 | 220 | 4 | 140-240 |
| | | | Quenched and tempered | 1000 | 300 | 5 | 140-240 |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | | Annealed | 600 | 200 | 6 | 140-240 |
| | | | Quenched and tempered | 930 | 275 | 7 | 100-180 |
| | | | | 1000 | 300 | 8 | 100-180 |
| | | | | 1200 | 350 | 9 | 100-180 |
| | High alloy steel, cast steel and tool steel | | Annealed | 680 | 200 | 10 | 140-200 |
| | | | Quenched and tempered | 1100 | 325 | 11 | 100-160 |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | 150-250 | |
| | | Martensitic | 820 | 240 | 13 | 150-250 | |
| | | Austenitic | 600 | 180 | 14 | 150-250 | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | 160-260 | |
| | | Pearlitic | | 250 | 16 | 160-260 | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | 160-260 | |
| | | Pearlitic | | 260 | 18 | 160-260 | |
| | Malleable cast iron | Ferritic | | 130 | 19 | 120-220 | |
| Pearlitic | | | 230 | 20 | 120-220 | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | 200-350 | |
| | | Cured | | 100 | 22 | 200-350 | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 | 200-350 |
| | | >12% Si | Cured | | 90 | 24 | 200-350 |
| | | | High temp. | | 130 | 25 | 200-350 |
| | Copper alloys | >1% Pb | Free cutting | | 110 | 26 | 150-250 |
| | | | Brass | | 90 | 27 | 150-250 |
| | | | Electrolytic copper | | 100 | 28 | 150-250 |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 | 150-250 |
| | | | Hard rubber | | | 30 | 150-250 |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 | 30-60 |
| | | | Cured | | 280 | 32 | 30-60 |
| | | Ni or Co based | Annealed | | 250 | 33 | 30-60 |
| | | | Cured | | 350 | 34 | 30-60 |
| | | | Cast | | 320 | 35 | 30-60 |
| | Titanium, Ti alloys | | | Rm 400 | | 36 | 50-80 |
| | | | Alpha+beta alloys cured | Rm 1050 | | 37 | 50-80 |
| H | Hardened steel | Hardened | | 55HRC | 38 | 30-60 | |
| | | Hardened | | 60HRC | 39 | 30-60 | |
| | Chilled cast iron | Cast | | 400 | 40 | 30-60 | |
| | Cast iron nodular | Hardened | | 55HRC | 41 | 30-60 | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions



Machining data for TOP-DRILL 2,3,4xD

| Feed (mm/rev) vs. drill diameter Drill length 2,3,4xD | | | | | | | | |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| SOMT 04 Ø12 - Ø13.5 | SOMT 05 Ø14 - Ø16 | SOMT 06 Ø17 - Ø19 | SOMT 07 Ø20 - Ø22 | SOMT 08 Ø23 - Ø26 | SOMT 09 Ø27 - Ø31 | SOMT 11 Ø32 - Ø36 | SOMT 13 Ø37 - Ø43 | SOMT 15 Ø44 - Ø50 |
| 0.04-0.06 | 0.04-0.06 | 0.04-0.06 | 0.04-0.08 | 0.04-0.08 | 0.06-0.10 | 0.06-0.10 | 0.08-0.12 | 0.08-0.12 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.12 | 0.06-0.12 | 0.08-0.14 | 0.08-0.14 | 0.08-0.16 | 0.10-0.16 |
| 0.08-0.12 | 0.08-0.12 | 0.08-0.12 | 0.08-0.16 | 0.08-0.16 | 0.10-0.16 | 0.10-0.16 | 0.10-0.18 | 0.10-0.18 |
| 0.08-0.12 | 0.08-0.12 | 0.08-0.12 | 0.08-0.16 | 0.08-0.16 | 0.10-0.16 | 0.10-0.16 | 0.10-0.18 | 0.10-0.18 |
| 0.08-0.12 | 0.08-0.12 | 0.08-0.12 | 0.08-0.16 | 0.08-0.16 | 0.10-0.16 | 0.10-0.16 | 0.10-0.18 | 0.10-0.18 |
| 0.06-0.16 | 0.06-0.16 | 0.06-0.16 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.10-0.22 | 0.10-0.22 | 0.10-0.24 |
| 0.06-0.16 | 0.06-0.16 | 0.06-0.16 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.22 | 0.10-0.22 | 0.10-0.22 |
| 0.06-0.16 | 0.06-0.16 | 0.06-0.16 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.22 | 0.10-0.22 | 0.10-0.22 |
| 0.06-0.16 | 0.06-0.16 | 0.06-0.16 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.22 | 0.10-0.22 | 0.10-0.22 |
| 0.06-0.12 | 0.06-0.12 | 0.06-0.12 | 0.08-0.16 | 0.08-0.16 | 0.08-0.18 | 0.08-0.20 | 0.10-0.20 | 0.10-0.20 |
| 0.06-0.12 | 0.06-0.12 | 0.06-0.12 | 0.08-0.16 | 0.08-0.16 | 0.08-0.18 | 0.08-0.20 | 0.10-0.20 | 0.10-0.20 |
| 0.06-0.12 | 0.06-0.12 | 0.06-0.12 | 0.06-0.16 | 0.06-0.16 | 0.08-0.18 | 0.08-0.20 | 0.10-0.20 | 0.10-0.20 |
| 0.06-0.12 | 0.06-0.12 | 0.06-0.12 | 0.06-0.16 | 0.06-0.16 | 0.08-0.18 | 0.08-0.20 | 0.10-0.20 | 0.10-0.20 |
| 0.06-0.12 | 0.06-0.12 | 0.06-0.12 | 0.06-0.16 | 0.06-0.16 | 0.08-0.18 | 0.08-0.20 | 0.10-0.20 | 0.10-0.20 |
| 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.10-0.20 | 0.10-0.20 | 0.10-0.20 | 0.10-0.20 | 0.10-0.22 | 0.10-0.22 |
| 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.10-0.20 | 0.10-0.20 | 0.10-0.20 | 0.10-0.20 | 0.10-0.22 | 0.10-0.22 |
| 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.10-0.20 | 0.10-0.20 | 0.10-0.20 | 0.10-0.20 | 0.10-0.22 | 0.10-0.22 |
| 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.10-0.20 | 0.10-0.20 | 0.10-0.20 | 0.10-0.20 | 0.10-0.22 | 0.10-0.22 |
| 0.08-0.14 | 0.08-0.14 | 0.08-0.14 | 0.10-0.16 | 0.10-0.16 | 0.10-0.16 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 |
| 0.08-0.14 | 0.08-0.14 | 0.08-0.14 | 0.10-0.16 | 0.10-0.16 | 0.10-0.16 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.18 | 0.08-0.18 | 0.10-0.18 | 0.10-0.18 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.18 | 0.08-0.18 | 0.10-0.18 | 0.10-0.18 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.18 | 0.08-0.18 | 0.10-0.18 | 0.10-0.18 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.18 | 0.08-0.18 | 0.10-0.18 | 0.10-0.18 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.16 | 0.08-0.17 | 0.10-0.18 | 0.10-0.18 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.16 | 0.08-0.17 | 0.10-0.18 | 0.10-0.18 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.16 | 0.08-0.17 | 0.10-0.18 | 0.10-0.18 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.10-0.17 | 0.10-0.17 | 0.10-0.18 | 0.10-0.18 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.10-0.17 | 0.10-0.17 | 0.10-0.18 | 0.10-0.18 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.06-0.10 | 0.06-0.10 | 0.06-0.12 | 0.06-0.12 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.06-0.10 | 0.06-0.10 | 0.06-0.12 | 0.06-0.12 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.06-0.10 | 0.06-0.10 | 0.06-0.12 | 0.06-0.12 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.06-0.10 | 0.06-0.10 | 0.06-0.12 | 0.06-0.12 |
| 0.06-0.09 | 0.06-0.09 | 0.06-0.09 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 |
| 0.06-0.09 | 0.06-0.09 | 0.06-0.09 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 |
| 0.05-0.09 | 0.05-0.09 | 0.05-0.09 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |
| 0.05-0.09 | 0.05-0.09 | 0.05-0.09 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |
| 0.05-0.09 | 0.05-0.09 | 0.05-0.09 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |
| 0.05-0.09 | 0.05-0.09 | 0.05-0.09 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |

Recommended Cutting Conditions

Machining data for TOP-DRILL 5xD

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | |
|-----------|--|------------------------|---------------------------------------|-------------|--------------|--------------------------|---------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 | 220-350 |
| | | >=0.25%C | Annealed | 650 | 190 | 2 | 180-280 |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 | 140-240 |
| | | >=0.55%C | Annealed | 750 | 220 | 4 | 140-240 |
| | | | Quenched and tempered | 1000 | 300 | 5 | 140-240 |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | | Annealed | 600 | 200 | 6 | 140-240 |
| | | | Quenched and tempered | 930 | 275 | 7 | 100-180 |
| | | | | 1000 | 300 | 8 | 100-180 |
| | | | | 1200 | 350 | 9 | 100-180 |
| | High alloy steel, cast steel and tool steel | | Annealed | 680 | 200 | 10 | 140-200 |
| | | | Quenched and tempered | 1100 | 325 | 11 | 100-160 |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | 150-250 | |
| | | Martensitic | 820 | 240 | 13 | 150-250 | |
| | | Austenitic | 600 | 180 | 14 | 150-250 | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | 160-260 | |
| | | Pearlitic | | 250 | 16 | 160-260 | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | 160-260 | |
| | | Pearlitic | | 260 | 18 | 160-260 | |
| | Malleable cast iron | Ferritic | | 130 | 19 | 120-220 | |
| Pearlitic | | | 230 | 20 | 120-220 | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | 200-350 | |
| | | Cured | | 100 | 22 | 200-350 | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 | 200-350 |
| | | >12% Si | Cured | | 90 | 24 | 200-350 |
| | | | High temp. | | 130 | 25 | 200-350 |
| | Copper alloys | >1% Pb | Free cutting | | 110 | 26 | 150-250 |
| | | | Brass | | 90 | 27 | 150-250 |
| | | | Electrolytic copper | | 100 | 28 | 150-250 |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 | 150-250 |
| | | | Hard rubber | | | 30 | 150-250 |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 | 30-60 |
| | | | Cured | | 280 | 32 | 30-60 |
| | | Ni or Co based | Annealed | | 250 | 33 | 30-60 |
| | | | Cured | | 350 | 34 | 30-60 |
| | | | Cast | | 320 | 35 | 30-60 |
| | Titanium, Ti alloys | | | Rm 400 | | 36 | 50-80 |
| | | | Alpha+beta alloys cured | Rm 1050 | | 37 | 50-80 |
| H | Hardened steel | Hardened | | 55HRC | 38 | 30-60 | |
| | | Hardened | | 60HRC | 39 | 30-60 | |
| | Chilled cast iron | Cast | | 400 | 40 | 30-60 | |
| | Cast iron nodular | Hardened | | 55HRC | 41 | 30-60 | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions



Machining data for TOP-DRILL 5xD

| Feed (mm/rev) vs. drill diameter Drill length 5xD | | | | | | | | |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| SOMT 04 Ø12 - Ø13.5 | SOMT 05 Ø14 - Ø16 | SOMT 06 Ø17 - Ø19 | SOMT 07 Ø20 - Ø22 | SOMT 08 Ø23 - Ø26 | SOMT 09 Ø27 - Ø31 | SOMT 11 Ø32 - Ø36 | SOMT 13 Ø37 - Ø43 | SOMT 15 Ø44 - Ø50 |
| 0.04-0.05 | 0.04-0.05 | 0.04-0.05 | 0.04-0.05 | 0.04-0.06 | 0.06-0.08 | 0.06-0.08 | 0.08-0.10 | 0.08-0.10 |
| 0.06-0.08 | 0.06-0.08 | 0.06-0.08 | 0.06-0.10 | 0.06-0.10 | 0.08-0.12 | 0.08-0.12 | 0.08-0.14 | 0.10-0.14 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.12 | 0.06-0.12 | 0.10-0.15 | 0.10-0.15 | 0.10-0.17 | 0.10-0.17 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.12 | 0.06-0.12 | 0.10-0.15 | 0.10-0.15 | 0.10-0.17 | 0.10-0.17 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.12 | 0.06-0.12 | 0.10-0.15 | 0.10-0.15 | 0.10-0.17 | 0.10-0.17 |
| 0.06-0.12 | 0.06-0.12 | 0.06-0.12 | 0.08-0.16 | 0.08-0.16 | 0.08-0.18 | 0.10-0.20 | 0.10-0.20 | 0.10-0.22 |
| 0.06-0.12 | 0.06-0.12 | 0.06-0.12 | 0.08-0.16 | 0.08-0.16 | 0.08-0.18 | 0.10-0.20 | 0.10-0.20 | 0.10-0.22 |
| 0.06-0.12 | 0.06-0.12 | 0.06-0.12 | 0.08-0.16 | 0.08-0.16 | 0.08-0.18 | 0.10-0.20 | 0.10-0.20 | 0.10-0.22 |
| 0.06-0.12 | 0.06-0.12 | 0.06-0.12 | 0.08-0.16 | 0.08-0.16 | 0.08-0.18 | 0.10-0.20 | 0.10-0.20 | 0.10-0.22 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.08-0.12 | 0.08-0.12 | 0.08-0.16 | 0.08-0.18 | 0.10-0.18 | 0.10-0.20 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.08-0.12 | 0.08-0.12 | 0.08-0.16 | 0.08-0.18 | 0.10-0.18 | 0.10-0.20 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.12 | 0.06-0.12 | 0.08-0.16 | 0.08-0.18 | 0.10-0.18 | 0.10-0.20 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.12 | 0.06-0.12 | 0.08-0.16 | 0.08-0.18 | 0.10-0.18 | 0.10-0.20 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.12 | 0.06-0.12 | 0.08-0.16 | 0.08-0.18 | 0.10-0.18 | 0.10-0.20 |
| 0.08-0.14 | 0.08-0.14 | 0.08-0.14 | 0.08-0.16 | 0.08-0.16 | 0.10-0.18 | 0.10-0.18 | 0.10-0.20 | 0.10-0.20 |
| 0.08-0.14 | 0.08-0.14 | 0.08-0.14 | 0.08-0.16 | 0.08-0.16 | 0.10-0.18 | 0.10-0.18 | 0.10-0.20 | 0.10-0.20 |
| 0.08-0.14 | 0.08-0.14 | 0.08-0.14 | 0.08-0.16 | 0.08-0.16 | 0.10-0.18 | 0.10-0.18 | 0.10-0.20 | 0.10-0.20 |
| 0.08-0.14 | 0.08-0.14 | 0.08-0.14 | 0.08-0.16 | 0.08-0.16 | 0.10-0.18 | 0.10-0.18 | 0.10-0.20 | 0.10-0.20 |
| 0.08-0.12 | 0.08-0.12 | 0.08-0.14 | 0.08-0.16 | 0.08-0.16 | 0.10-0.16 | 0.10-0.16 | 0.10-0.16 | 0.10-0.16 |
| 0.08-0.12 | 0.08-0.12 | 0.08-0.14 | 0.08-0.16 | 0.08-0.16 | 0.10-0.16 | 0.10-0.16 | 0.10-0.16 | 0.10-0.16 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.16 | 0.08-0.16 | 0.10-0.17 | 0.10-0.17 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.16 | 0.08-0.16 | 0.10-0.17 | 0.10-0.17 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.16 | 0.08-0.16 | 0.10-0.17 | 0.10-0.17 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.16 | 0.08-0.16 | 0.10-0.17 | 0.10-0.17 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.16 | 0.08-0.16 | 0.10-0.17 | 0.10-0.17 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.15 | 0.08-0.16 | 0.10-0.17 | 0.10-0.17 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.15 | 0.08-0.16 | 0.10-0.17 | 0.10-0.17 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.08-0.15 | 0.08-0.16 | 0.10-0.17 | 0.10-0.17 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.10-0.16 | 0.10-0.16 | 0.10-0.17 | 0.10-0.17 |
| 0.06-0.15 | 0.06-0.15 | 0.06-0.15 | 0.08-0.16 | 0.08-0.16 | 0.10-0.16 | 0.10-0.16 | 0.10-0.17 | 0.10-0.17 |
| 0.05-0.07 | 0.05-0.07 | 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.06-0.09 | 0.06-0.09 | 0.06-0.10 | 0.06-0.10 |
| 0.05-0.07 | 0.05-0.07 | 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.06-0.09 | 0.06-0.09 | 0.06-0.10 | 0.06-0.10 |
| 0.05-0.07 | 0.05-0.07 | 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.06-0.09 | 0.06-0.09 | 0.06-0.10 | 0.06-0.10 |
| 0.05-0.07 | 0.05-0.07 | 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.06-0.09 | 0.06-0.09 | 0.06-0.10 | 0.06-0.10 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.06-0.09 | 0.06-0.09 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.06-0.09 | 0.06-0.09 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |

Recommended Cutting Conditions

Machining data for TOP-DRILL cartridge

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | | |
|-----------|--|-------------------------|---------------------------------------|-------------|--------------|--------------------------|---------|---------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 | 250-350 | |
| | | >=0.25%C | Annealed | 650 | 190 | 2 | 160-250 | |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 | 140-240 | |
| | | >=0.55%C | Annealed | 750 | 220 | 4 | 140-240 | |
| | | | Quenched and tempered | 1000 | 300 | 5 | 140-240 | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | | Annealed | | 600 | 200 | 6 | 140-240 |
| | | | | | 930 | 275 | 7 | 100-180 |
| | | | Quenched and tempered | | 1000 | 300 | 8 | 100-180 |
| | | | | | 1200 | 350 | 9 | 100-180 |
| | High alloy steel, cast steel and tool steel | | Annealed | 680 | 200 | 10 | 140-200 | |
| | | | Quenched and tempered | 1100 | 325 | 11 | 100-160 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | 150-250 | | |
| | | Martensitic | 820 | 240 | 13 | 150-250 | | |
| | | Austenitic | 600 | 180 | 14 | 150-250 | | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | 160-260 | | |
| | | Pearlitic | | 250 | 16 | 160-260 | | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | 160-260 | | |
| | | Pearlitic | | 260 | 18 | 160-260 | | |
| | Malleable cast iron | Ferritic | | 130 | 19 | 120-220 | | |
| Pearlitic | | | 230 | 20 | 120-220 | | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | 200-350 | | |
| | | Cured | | 100 | 22 | 200-350 | | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 | 200-350 | |
| | | | Cured | | 90 | 24 | 200-350 | |
| | | >12% Si | High temp. | | 130 | 25 | 200-350 | |
| | Copper alloys | >1% Pb | Free cutting | | 110 | 26 | 150-250 | |
| | | | Brass | | 90 | 27 | 150-250 | |
| | | | Electrolitic copper | | 100 | 28 | 150-250 | |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 | 150-250 | |
| | | | Hard rubber | | | 30 | 150-250 | |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 | 30-60 | |
| | | | Cured | | 280 | 32 | 30-60 | |
| | | Ni or Co based | Annealed | | 250 | 33 | 30-60 | |
| | | | Cured | | 350 | 34 | 30-60 | |
| | | | Cast | | 320 | 35 | 30-60 | |
| | Titanium, Ti alloys | | | Rm 400 | | 36 | 50-80 | |
| | | Alpha+beta alloys cured | | Rm 1050 | | 37 | 50-80 | |
| H | Hardened steel | Hardened | | | 55HRC | 38 | 30-60 | |
| | | Hardened | | | 60HRC | 39 | 30-60 | |
| | Chilled cast iron | Cast | | | 400 | 40 | 30-60 | |
| | Cast iron nodular | Hardened | | | 55HRC | 41 | 30-60 | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions



Machining data for TOP-DRILL cartridge

| Feed (mm/rev) vs. drill diameter Drill length 2,3,4xD | | | | | |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|
| SOMT 09 Ø51 - Ø55 | SOMT 11 Ø56 - Ø60 | SOMT 11 Ø61 - Ø65 | SOMT 11 Ø66 - Ø70 | SOMT 13 Ø71 - Ø75 | SOMT 13 Ø76 - Ø80 |
| 0.06-0.12 | 0.06-0.12 | 0.06-0.12 | 0.06-0.12 | 0.06-0.12 | 0.06-0.12 |
| 0.06-0.16 | 0.06-0.16 | 0.06-0.16 | 0.06-0.16 | 0.06-0.16 | 0.06-0.16 |
| 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 |
| 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 |
| 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 |
| 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 |
| 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 |
| 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 |
| 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 |
| 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 | 0.08-0.20 |
| 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 |
| 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 |
| 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 |
| 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 |
| 0.10-0.22 | 0.10-0.22 | 0.10-0.22 | 0.10-0.22 | 0.10-0.22 | 0.10-0.22 |
| 0.10-0.22 | 0.10-0.22 | 0.10-0.22 | 0.10-0.22 | 0.10-0.22 | 0.10-0.22 |
| 0.10-0.22 | 0.10-0.22 | 0.10-0.22 | 0.10-0.22 | 0.10-0.22 | 0.10-0.22 |
| 0.10-0.22 | 0.10-0.22 | 0.10-0.22 | 0.10-0.22 | 0.10-0.22 | 0.10-0.22 |
| 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 |
| 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 |
| 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 |
| 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 |
| 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 |
| 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 |
| 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 | 0.06-0.18 |
| 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 |
| 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 |
| 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 |
| 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 |
| 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 | 0.10-0.18 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 |
| 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 | 0.06-0.10 |
| 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |
| 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |
| 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |
| 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |

Recommended Cutting Conditions

Machining data for T-DRILL 2,3,4xD

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | | |
|-----------|--|------------------------|---------------------------------------|---------------------|--------------|--------------------------|---------|---------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 | 250-350 | |
| | | >=0.25%C | Annealed | 650 | 190 | 2 | 180-250 | |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 | 160-220 | |
| | | >=0.55%C | Annealed | 750 | 220 | 4 | 160-220 | |
| | | | Quenched and tempered | 1000 | 300 | 5 | 160-220 | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | | Annealed | | 600 | 200 | 6 | 150-220 |
| | | | | | 930 | 275 | 7 | 120-160 |
| | | | Quenched and tempered | | 1000 | 300 | 8 | 120-160 |
| | | | | | 1200 | 350 | 9 | 120-160 |
| | High alloy steel, cast steel and tool steel | | Annealed | 680 | 200 | 10 | 140-180 | |
| | | | Quenched and tempered | 1100 | 325 | 11 | 130-180 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | 170-240 | | |
| | | Martensitic | 820 | 240 | 13 | 170-240 | | |
| | | Austenitic | 600 | 180 | 14 | 170-240 | | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | 180-250 | | |
| | | Pearlitic | | 250 | 16 | 180-250 | | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | 180-250 | | |
| | | Pearlitic | | 260 | 18 | 180-250 | | |
| | Malleable cast iron | Ferritic | | 130 | 19 | 130-200 | | |
| Pearlitic | | | 230 | 20 | 130-200 | | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | 330-380 | | |
| | | Cured | | 100 | 22 | 330-380 | | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 | 330-380 | |
| | | | Cured | | 90 | 24 | 330-380 | |
| | | >12% Si | High temp. | | 130 | 25 | 330-380 | |
| | Copper alloys | | >1% Pb | Free cutting | | 110 | 26 | 150-230 |
| | | | | Brass | | 90 | 27 | 150-230 |
| | | | | Electrolytic copper | | 100 | 28 | 150-230 |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 | 150-230 | |
| | | | Hard rubber | | | 30 | 150-230 | |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 | 30-60 | |
| | | | Cured | | 280 | 32 | 30-60 | |
| | | Ni or Co based | Annealed | | 250 | 33 | 30-60 | |
| | | | Cured | | 350 | 34 | 30-60 | |
| | | | Cast | | 320 | 35 | 30-60 | |
| | Titanium, Ti alloys | | | Rm 400 | | 36 | 30-60 | |
| | | | Alpha+beta alloys cured | Rm 1050 | | 37 | 30-60 | |
| H | Hardened steel | Hardened | | 55HRC | 38 | 30-60 | | |
| | | Hardened | | 60HRC | 39 | 30-60 | | |
| | Chilled cast iron | Cast | | 400 | 40 | 30-60 | | |
| | Cast iron nodular | Hardened | | 55HRC | 41 | 30-60 | | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions



Machining data for T-DRILL 2,3,4xD

| Feed (mm/rev) vs. drill diameter Drill length 2,3,4xD | | | | | |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|
| SPMG 05 Ø12.5 - Ø15 | SPMG 06 Ø16 - Ø21 | SPMG 07 Ø22 - Ø27 | SPMG 09 Ø28 - Ø33 | SPMG 11 Ø34 - Ø41 | SPMG 14 Ø42 - Ø50 |
| 0.04-0.06 | 0.04-0.06 | 0.04-0.08 | 0.04-0.08 | 0.06-0.10 | 0.06-0.12 |
| 0.05-0.08 | 0.06-0.10 | 0.06-0.12 | 0.07-0.13 | 0.08-0.15 | 0.08-0.16 |
| 0.06-0.12 | 0.08-0.15 | 0.10-0.18 | 0.12-0.22 | 0.12-0.24 | 0.13-0.25 |
| 0.06-0.12 | 0.08-0.15 | 0.10-0.18 | 0.12-0.22 | 0.12-0.24 | 0.13-0.25 |
| 0.06-0.12 | 0.08-0.14 | 0.10-0.18 | 0.12-0.20 | 0.12-0.20 | 0.13-0.20 |
| 0.06-0.15 | 0.06-0.15 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 |
| 0.06-0.15 | 0.06-0.15 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 |
| 0.06-0.15 | 0.06-0.15 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 | 0.08-0.18 |
| 0.06-0.10 | 0.06-0.10 | 0.08-0.12 | 0.08-0.14 | 0.08-0.14 | 0.08-0.14 |
| 0.06-0.10 | 0.08-0.12 | 0.10-0.15 | 0.12-0.15 | 0.12-0.18 | 0.13-0.18 |
| 0.05-0.10 | 0.06-0.12 | 0.08-0.15 | 0.09-0.16 | 0.10-0.17 | 0.11-0.18 |
| 0.05-0.10 | 0.06-0.12 | 0.08-0.15 | 0.09-0.16 | 0.10-0.17 | 0.11-0.18 |
| 0.05-0.10 | 0.06-0.12 | 0.08-0.15 | 0.09-0.16 | 0.10-0.17 | 0.11-0.18 |
| 0.06-0.12 | 0.08-0.16 | 0.12-0.20 | 0.15-0.25 | 0.16-0.28 | 0.18-0.30 |
| 0.06-0.12 | 0.08-0.16 | 0.12-0.20 | 0.15-0.25 | 0.16-0.28 | 0.18-0.30 |
| 0.06-0.12 | 0.08-0.16 | 0.12-0.20 | 0.15-0.25 | 0.16-0.28 | 0.18-0.30 |
| 0.06-0.12 | 0.08-0.16 | 0.12-0.20 | 0.15-0.25 | 0.16-0.28 | 0.18-0.30 |
| 0.06-0.10 | 0.08-0.15 | 0.10-0.18 | 0.12-0.20 | 0.15-0.23 | 0.16-0.25 |
| 0.06-0.10 | 0.08-0.15 | 0.10-0.18 | 0.12-0.20 | 0.15-0.23 | 0.16-0.25 |
| 0.06-0.14 | 0.08-0.15 | 0.10-0.20 | 0.12-0.22 | 0.14-0.23 | 0.15-0.26 |
| 0.06-0.14 | 0.08-0.15 | 0.10-0.20 | 0.12-0.22 | 0.14-0.23 | 0.15-0.26 |
| 0.06-0.14 | 0.08-0.15 | 0.10-0.20 | 0.12-0.22 | 0.14-0.23 | 0.15-0.26 |
| 0.06-0.14 | 0.08-0.15 | 0.10-0.20 | 0.12-0.22 | 0.14-0.23 | 0.15-0.26 |
| 0.06-0.14 | 0.08-0.15 | 0.10-0.20 | 0.12-0.22 | 0.14-0.23 | 0.15-0.26 |
| 0.06-0.13 | 0.06-0.13 | 0.08-0.15 | 0.08-0.15 | 0.08-0.15 | 0.08-0.15 |
| 0.06-0.13 | 0.06-0.13 | 0.08-0.15 | 0.08-0.15 | 0.08-0.15 | 0.08-0.15 |
| 0.06-0.13 | 0.06-0.13 | 0.08-0.15 | 0.08-0.15 | 0.08-0.15 | 0.08-0.15 |
| 0.06-0.13 | 0.06-0.13 | 0.08-0.15 | 0.08-0.15 | 0.08-0.15 | 0.08-0.15 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 |
| 0.05-0.10 | 0.06-0.14 | 0.08-0.18 | 0.10-0.22 | 0.14-0.23 | 0.15-0.24 |
| 0.05-0.10 | 0.06-0.14 | 0.08-0.18 | 0.10-0.22 | 0.14-0.23 | 0.15-0.24 |
| 0.05-0.09 | 0.05-0.09 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |
| 0.05-0.09 | 0.05-0.09 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |
| 0.05-0.09 | 0.05-0.09 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |
| 0.05-0.09 | 0.05-0.09 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 | 0.05-0.10 |

Recommended Cutting Conditions

Machining data for T-DRILL 5xD

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | | |
|-----------|--|------------------------|---------------------------------------|-------------|--------------|--------------------------|---------|---------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 | 250-350 | |
| | | >=0.25%C | Annealed | 650 | 190 | 2 | 180-250 | |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 | 160-220 | |
| | | >=0.55%C | Annealed | 750 | 220 | 4 | 160-220 | |
| | | | Quenched and tempered | 1000 | 300 | 5 | 160-220 | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | | Annealed | | 600 | 200 | 6 | 150-220 |
| | | | | | 930 | 275 | 7 | 120-160 |
| | | | Quenched and tempered | | 1000 | 300 | 8 | 120-160 |
| | | | | | 1200 | 350 | 9 | 120-160 |
| | High alloy steel, cast steel and tool steel | | Annealed | 680 | 200 | 10 | 140-180 | |
| | | | Quenched and tempered | 1100 | 325 | 11 | 130-180 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | 170-240 | | |
| | | Martensitic | 820 | 240 | 13 | 170-240 | | |
| | | Austenitic | 600 | 180 | 14 | 170-240 | | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | 180-250 | | |
| | | Pearlitic | | 250 | 16 | 180-250 | | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | 180-250 | | |
| | | Pearlitic | | 260 | 18 | 180-250 | | |
| | Malleable cast iron | Ferritic | | 130 | 19 | 130-200 | | |
| Pearlitic | | | 230 | 20 | 130-200 | | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | 330-380 | | |
| | | Cured | | 100 | 22 | 330-380 | | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 | 330-380 | |
| | | | Cured | | 90 | 24 | 330-380 | |
| | | >12% Si | High temp. | | 130 | 25 | 330-380 | |
| | Copper alloys | >1% Pb | Free cutting | | 110 | 26 | 150-230 | |
| | | | Brass | | 90 | 27 | 150-230 | |
| | | | Electrolytic copper | | 100 | 28 | 150-230 | |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 | 150-230 | |
| | | | Hard rubber | | | 30 | 150-230 | |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 | 30-60 | |
| | | | Cured | | 280 | 32 | 30-60 | |
| | | Ni or Co based | Annealed | | 250 | 33 | 30-60 | |
| | | | Cured | | 350 | 34 | 30-60 | |
| | | | Cast | | 320 | 35 | 30-60 | |
| | Titanium, Ti alloys | | | Rm 400 | | 36 | 30-60 | |
| | | | Alpha+beta alloys cured | Rm 1050 | | 37 | 30-60 | |
| H | Hardened steel | Hardened | | 55HRC | 38 | 30-60 | | |
| | | Hardened | | 60HRC | 39 | 30-60 | | |
| | Chilled cast iron | Cast | | 400 | 40 | 30-60 | | |
| | Cast iron nodular | Hardened | | 55HRC | 41 | 30-60 | | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions



Machining data for T-DRILL 5xD

| Feed (mm/rev) vs. drill diameter Drill length 5xD | | | | | |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|
| SPMG 05 Ø12.5 - Ø15 | SPMG 06 Ø16 - Ø21 | SPMG 07 Ø22 - Ø27 | SPMG 09 Ø28 - Ø33 | SPMG 11 Ø34 - Ø41 | SPMG 14 Ø42 - Ø50 |
| 0.04-0.05 | 0.04-0.05 | 0.04-0.06 | 0.04-0.07 | 0.06-0.08 | 0.06-0.10 |
| 0.06-0.08 | 0.06-0.08 | 0.06-0.10 | 0.07-0.12 | 0.08-0.13 | 0.08-0.14 |
| 0.06-0.10 | 0.08-0.13 | 0.10-0.16 | 0.12-0.20 | 0.12-0.22 | 0.13-0.23 |
| 0.06-0.10 | 0.08-0.13 | 0.10-0.16 | 0.12-0.20 | 0.12-0.22 | 0.13-0.23 |
| 0.06-0.10 | 0.08-0.12 | 0.10-0.16 | 0.12-0.18 | 0.12-0.18 | 0.13-0.18 |
| 0.06-0.12 | 0.06-0.13 | 0.08-0.16 | 0.08-0.16 | 0.08-0.17 | 0.08-0.17 |
| 0.06-0.12 | 0.06-0.13 | 0.08-0.16 | 0.08-0.16 | 0.08-0.17 | 0.08-0.17 |
| 0.06-0.12 | 0.06-0.13 | 0.08-0.16 | 0.08-0.16 | 0.08-0.17 | 0.08-0.17 |
| 0.06-0.08 | 0.06-0.08 | 0.08-0.10 | 0.08-0.12 | 0.08-0.12 | 0.08-0.12 |
| 0.06-0.09 | 0.08-0.10 | 0.10-0.13 | 0.12-0.13 | 0.12-0.15 | 0.12-0.16 |
| 0.05-0.09 | 0.06-0.10 | 0.08-0.13 | 0.09-0.15 | 0.10-0.15 | 0.10-0.17 |
| 0.05-0.09 | 0.06-0.10 | 0.08-0.13 | 0.09-0.15 | 0.10-0.15 | 0.10-0.17 |
| 0.05-0.09 | 0.06-0.10 | 0.08-0.13 | 0.09-0.15 | 0.10-0.15 | 0.10-0.17 |
| 0.06-0.10 | 0.08-0.15 | 0.12-0.18 | 0.15-0.22 | 0.16-0.25 | 0.18-0.28 |
| 0.06-0.10 | 0.08-0.15 | 0.12-0.18 | 0.15-0.22 | 0.16-0.25 | 0.18-0.28 |
| 0.06-0.10 | 0.08-0.15 | 0.12-0.18 | 0.15-0.22 | 0.16-0.25 | 0.18-0.28 |
| 0.06-0.10 | 0.08-0.15 | 0.12-0.18 | 0.15-0.22 | 0.16-0.25 | 0.18-0.28 |
| 0.06-0.08 | 0.08-0.12 | 0.10-0.16 | 0.12-0.18 | 0.15-0.22 | 0.16-0.23 |
| 0.06-0.08 | 0.08-0.12 | 0.10-0.16 | 0.12-0.18 | 0.15-0.22 | 0.16-0.23 |
| 0.06-0.12 | 0.08-0.15 | 0.10-0.13 | 0.12-0.18 | 0.14-0.20 | 0.14-0.24 |
| 0.06-0.12 | 0.08-0.15 | 0.10-0.13 | 0.12-0.18 | 0.14-0.20 | 0.14-0.24 |
| 0.06-0.12 | 0.08-0.15 | 0.10-0.13 | 0.12-0.18 | 0.14-0.20 | 0.14-0.24 |
| 0.06-0.12 | 0.08-0.15 | 0.10-0.13 | 0.12-0.18 | 0.14-0.20 | 0.14-0.24 |
| 0.06-0.12 | 0.06-0.12 | 0.08-0.13 | 0.08-0.13 | 0.08-0.14 | 0.08-0.14 |
| 0.06-0.12 | 0.06-0.12 | 0.08-0.13 | 0.08-0.13 | 0.08-0.14 | 0.08-0.14 |
| 0.06-0.12 | 0.06-0.12 | 0.08-0.13 | 0.08-0.13 | 0.08-0.14 | 0.08-0.14 |
| 0.06-0.12 | 0.06-0.12 | 0.08-0.13 | 0.08-0.13 | 0.08-0.14 | 0.08-0.14 |
| 0.05-0.07 | 0.05-0.07 | 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.05-0.08 |
| 0.05-0.07 | 0.05-0.07 | 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.05-0.08 |
| 0.05-0.07 | 0.05-0.07 | 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.05-0.08 |
| 0.05-0.07 | 0.05-0.07 | 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.05-0.08 |
| 0.05-0.07 | 0.05-0.07 | 0.05-0.08 | 0.05-0.08 | 0.05-0.08 | 0.05-0.08 |
| 0.05-0.09 | 0.08-0.13 | 0.08-0.17 | 0.10-0.20 | 0.14-0.22 | 0.14-0.24 |
| 0.05-0.09 | 0.08-0.13 | 0.08-0.17 | 0.10-0.20 | 0.14-0.22 | 0.14-0.24 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 |
| 0.05-0.08 | 0.05-0.08 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 | 0.05-0.09 |

Recommended Cutting Conditions

Machining data for DRILL-SFEED

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | |
|-------------------|--|------------------------|---------------------------------------|-------------|--------------|----|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 |
| | | ≥0.25%C | Annealed | 650 | 190 | 2 |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 |
| | | ≥0.55%C | Annealed | 750 | 220 | 4 |
| | | | Quenched and tempered | 1000 | 300 | 5 |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | | Annealed | 600 | 200 | 6 |
| | | | Quenched and tempered | 930 | 275 | 7 |
| | | | | 1000 | 300 | 8 |
| | | | | 1200 | 350 | 9 |
| | High alloy steel, cast steel and tool steel | | Annealed | 680 | 200 | 10 |
| | | | Quenched and tempered | 1100 | 325 | 11 |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | |
| | | Martensitic | 820 | 240 | 13 | |
| | | Austenitic | 600 | 180 | 14 | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | |
| | | Pearlitic | | 250 | 16 | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | |
| | | Pearlitic | | 260 | 18 | |
| | Malleable cast iron | Ferritic | | 130 | 19 | |
| | Pearlitic | | 230 | 20 | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | |
| | | Cured | | 100 | 22 | |
| | Aluminum-cast, alloyed | ≤12% Si | Not cureable | | 75 | 23 |
| | | | Cured | | 90 | 24 |
| | | >12% Si | High temp. | | 130 | 25 |
| | Copper alloys | >1% Pb | Free cutting | | 110 | 26 |
| | | | Brass | | 90 | 27 |
| | | | Electrolitic copper | | 100 | 28 |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 |
| | | | Hard rubber | | | 30 |
| S | High temp. alloys | Fe based | Annealed | 200 | 31 | |
| | | | Cured | 280 | 32 | |
| | | Ni or Co based | Annealed | 250 | 33 | |
| | | | Cured | 350 | 34 | |
| | | | Cast | 320 | 35 | |
| | Titanium, Ti alloys | | | Rm 400 | | 36 |
| | | | Alpha+beta alloys cured | Rm 1050 | | 37 |
| H | Hardened steel | Hardened | | 55HRC | 38 | |
| | | Hardened | | 60HRC | 39 | |
| | Chilled cast iron | Cast | | 400 | 40 | |
| Cast iron nodular | Hardened | | 55HRC | 41 | | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions

Machining data for DRILL-RUSH

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | | |
|-----------|--|------------------------|---------------------------------------|-------------|--------------|--------------------------|--------|--------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 | 80-140 | |
| | | >=0.25%C | Annealed | 650 | 190 | 2 | 80-130 | |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 | 80-120 | |
| | | >=0.55%C | Annealed | 750 | 220 | 4 | 70-110 | |
| | | | Quenched and tempered | 1000 | 300 | 5 | 50-90 | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | | Annealed | | 600 | 200 | 6 | 70-120 |
| | | | | | 930 | 275 | 7 | 70-110 |
| | | | Quenched and tempered | | 1000 | 300 | 8 | 50-90 |
| | | | | | 1200 | 350 | 9 | 40-70 |
| | High alloy steel, cast steel and tool steel | | Annealed | 680 | 200 | 10 | 50-90 | |
| | | | Quenched and tempered | 1100 | 325 | 11 | 40-80 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | 40-70 | | |
| | | Martensitic | 820 | 240 | 13 | 40-70 | | |
| | | Austenitic | 600 | 180 | 14 | 30-70 | | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | 90-160 | | |
| | | Pearlitic | | 250 | 16 | 80-140 | | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | 90-180 | | |
| | | Pearlitic | | 260 | 18 | 80-140 | | |
| | Malleable cast iron | Ferritic | | 130 | 19 | 90-160 | | |
| Pearlitic | | | 230 | 20 | 80-140 | | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | 90-220 | | |
| | | Cured | | 100 | 22 | 90-220 | | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 | 90-220 | |
| | | | Cured | | 90 | 24 | 90-220 | |
| | | >12% Si | High temp. | | 130 | 25 | 80-160 | |
| | Copper alloys | >1% Pb | Free cutting | | 110 | 26 | 90-220 | |
| | | | Brass | | 90 | 27 | 90-220 | |
| | | | Electrolitic copper | | 100 | 28 | 90-220 | |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 | | |
| | | | Hard rubber | | | | 30 | |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 | 30-60 | |
| | | | Cured | | 280 | 32 | 20-50 | |
| | | Ni or Co based | Annealed | | 250 | 33 | 20-50 | |
| | | | Cured | | 350 | 34 | 20-50 | |
| | | | Cast | | 320 | 35 | 20-50 | |
| | Titanium, Ti alloys | | | Rm 400 | | 36 | 20-50 | |
| | | | Alpha+beta alloys cured | Rm 1050 | | 37 | 20-50 | |
| H | Hardened steel | Hardened | | 55HRC | 38 | 20-50 | | |
| | | Hardened | | 60HRC | 39 | 20-50 | | |
| | Chilled cast iron | Cast | | 400 | 40 | | | |
| | Cast iron nodular | Hardened | | 55HRC | 41 | | | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions

Machining data for MODU-R-DRILL

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | | |
|-------------------|--|------------------------|---------------------------------------|-------------|--------------|--------------------------|---------|---------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 | 120-200 | |
| | | >=0.25%C | Annealed | 650 | 190 | 2 | 120-200 | |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 | 130-190 | |
| | | >=0.55%C | Annealed | 750 | 220 | 4 | 130-190 | |
| | | | Quenched and tempered | 1000 | 300 | 5 | 130-190 | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | | Annealed | | 600 | 200 | 6 | 100-200 |
| | | | | | 930 | 275 | 7 | 100-200 |
| | | | Quenched and tempered | | 1000 | 300 | 8 | 100-200 |
| | | | | | 1200 | 350 | 9 | 100-200 |
| | High alloy steel, cast steel and tool steel | | Annealed | 680 | 200 | 10 | 100-160 | |
| | | | Quenched and tempered | 1100 | 325 | 11 | 100-160 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | 80-140 | | |
| | | Martensitic | 820 | 240 | 13 | 80-140 | | |
| | | Austenitic | 600 | 180 | 14 | 80-140 | | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | 100-250 | | |
| | | Pearlitic | | 250 | 16 | 100-250 | | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | 100-250 | | |
| | | Pearlitic | | 260 | 18 | 100-250 | | |
| | Malleable cast iron | Ferritic | | 130 | 19 | 100-250 | | |
| Pearlitic | | | 230 | 20 | 100-250 | | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | 160-260 | | |
| | | Cured | | 100 | 22 | 160-260 | | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 | 160-260 | |
| | | | Cured | | 90 | 24 | 160-260 | |
| | | >12% Si | High temp. | | 130 | 25 | 160-260 | |
| | Copper alloys | >1% Pb | Free cutting | | 110 | 26 | 160-260 | |
| | | | Brass | | 90 | 27 | 160-260 | |
| | | | Electrolytic copper | | 100 | 28 | 160-260 | |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 | | |
| | | | Hard rubber | | | 30 | | |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 | 30-60 | |
| | | | Cured | | 280 | 32 | 30-80 | |
| | | Ni or Co based | Annealed | | 250 | 33 | 30-80 | |
| | | | Cured | | 350 | 34 | 30-80 | |
| | | | Cast | | 320 | 35 | 30-80 | |
| | Titanium, Ti alloys | | | Rm 400 | | 36 | 30-80 | |
| | | | Alpha+beta alloys cured | Rm 1050 | | 37 | 30-80 | |
| H | Hardened steel | Hardened | | 55HRC | 38 | 20-50 | | |
| | | Hardened | | 60HRC | 39 | 20-50 | | |
| | Chilled cast iron | Cast | | 400 | 40 | | | |
| Cast iron nodular | Hardened | | 55HRC | 41 | | | | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions

Machining data for MODU-R-DRILL

| Feed (mm/rev) vs. drill diameter | | | | | |
|----------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
| SPGX 06 Ø26 - Ø28 | SPGX 07 Ø29 - Ø32 | SPGX 09 Ø33 - Ø36 | SPGX 11 Ø37 - Ø43 | SPGX 11 Ø44 - Ø45 | SPGX 14 Ø46 - Ø50 |
| 0.20-0.35 | 0.25-0.35 | 0.2-0.4 | 0.25-0.4 | 0.28-0.45 | 0.28-0.45 |
| 0.20-0.35 | 0.25-0.35 | 0.2-0.4 | 0.25-0.4 | 0.28-0.45 | 0.28-0.45 |
| 0.20-0.35 | 0.25-0.35 | 0.2-0.4 | 0.25-0.4 | 0.28-0.45 | 0.28-0.45 |
| 0.20-0.35 | 0.25-0.35 | 0.2-0.4 | 0.25-0.4 | 0.28-0.45 | 0.28-0.45 |
| 0.20-0.35 | 0.25-0.35 | 0.2-0.4 | 0.25-0.4 | 0.28-0.45 | 0.28-0.45 |
| 0.20-0.33 | 0.25-0.33 | 0.25-0.36 | 0.25-0.36 | 0.25-0.40 | 0.25-0.40 |
| 0.20-0.33 | 0.25-0.33 | 0.25-0.36 | 0.25-0.36 | 0.25-0.40 | 0.25-0.40 |
| 0.20-0.33 | 0.25-0.33 | 0.25-0.36 | 0.25-0.36 | 0.25-0.40 | 0.25-0.40 |
| 0.20-0.33 | 0.25-0.33 | 0.25-0.36 | 0.25-0.36 | 0.25-0.40 | 0.25-0.40 |
| 0.20-0.33 | 0.25-0.33 | 0.25-0.36 | 0.25-0.36 | 0.25-0.40 | 0.25-0.40 |
| 0.20-0.33 | 0.25-0.33 | 0.25-0.36 | 0.25-0.36 | 0.25-0.40 | 0.25-0.40 |
| 0.12-0.24 | 0.15-0.24 | 0.16-0.25 | 0.18-0.28 | 0.18-0.30 | 0.18-0.30 |
| 0.12-0.24 | 0.15-0.24 | 0.16-0.25 | 0.18-0.28 | 0.18-0.30 | 0.18-0.30 |
| 0.12-0.24 | 0.15-0.24 | 0.16-0.25 | 0.18-0.28 | 0.18-0.30 | 0.18-0.30 |
| 0.25-0.45 | 0.25-0.45 | 0.3-0.5 | 0.3-0.5 | 0.35-0.55 | 0.35-0.55 |
| 0.25-0.45 | 0.25-0.45 | 0.3-0.5 | 0.3-0.5 | 0.35-0.55 | 0.35-0.55 |
| 0.25-0.45 | 0.25-0.45 | 0.3-0.5 | 0.3-0.5 | 0.35-0.55 | 0.35-0.55 |
| 0.25-0.45 | 0.25-0.45 | 0.3-0.5 | 0.3-0.5 | 0.35-0.55 | 0.35-0.55 |
| 0.25-0.45 | 0.25-0.45 | 0.3-0.5 | 0.3-0.5 | 0.35-0.55 | 0.35-0.55 |
| 0.25-0.45 | 0.25-0.45 | 0.3-0.5 | 0.3-0.5 | 0.35-0.55 | 0.35-0.55 |
| 0.3-0.5 | 0.3-0.5 | 0.35-0.55 | 0.35-0.55 | 0.4-0.6 | 0.4-0.6 |
| 0.3-0.5 | 0.3-0.5 | 0.35-0.55 | 0.35-0.55 | 0.4-0.6 | 0.4-0.6 |
| 0.3-0.5 | 0.3-0.5 | 0.35-0.55 | 0.35-0.55 | 0.4-0.6 | 0.4-0.6 |
| 0.3-0.5 | 0.3-0.5 | 0.35-0.55 | 0.35-0.55 | 0.4-0.6 | 0.4-0.6 |
| 0.3-0.5 | 0.3-0.5 | 0.35-0.55 | 0.35-0.55 | 0.4-0.6 | 0.4-0.6 |
| 0.3-0.5 | 0.3-0.5 | 0.35-0.55 | 0.35-0.55 | 0.4-0.6 | 0.4-0.6 |
| 0.3-0.5 | 0.3-0.5 | 0.35-0.55 | 0.35-0.55 | 0.4-0.6 | 0.4-0.6 |
| 0.3-0.5 | 0.3-0.5 | 0.35-0.55 | 0.35-0.55 | 0.4-0.6 | 0.4-0.6 |
| | | | | | |
| | | | | | |
| 0.1-0.16 | 0.10-0.18 | 0.15-0.20 | 0.15-0.22 | 0.16-0.24 | 0.16-0.24 |
| 0.1-0.16 | 0.10-0.18 | 0.15-0.20 | 0.15-0.22 | 0.16-0.24 | 0.16-0.24 |
| 0.1-0.16 | 0.10-0.18 | 0.15-0.20 | 0.15-0.22 | 0.16-0.24 | 0.16-0.24 |
| 0.1-0.16 | 0.10-0.18 | 0.15-0.20 | 0.15-0.22 | 0.16-0.24 | 0.16-0.24 |
| 0.1-0.16 | 0.10-0.18 | 0.15-0.20 | 0.15-0.22 | 0.16-0.24 | 0.16-0.24 |
| 0.1-0.16 | 0.10-0.18 | 0.15-0.20 | 0.15-0.22 | 0.16-0.24 | 0.16-0.24 |
| 0.1-0.16 | 0.10-0.18 | 0.15-0.20 | 0.15-0.22 | 0.16-0.24 | 0.16-0.24 |
| 0.1-0.16 | 0.12-0.18 | 0.14-0.20 | 0.14-0.20 | 0.16-0.22 | 0.16-0.22 |
| 0.1-0.16 | 0.12-0.18 | 0.14-0.20 | 0.14-0.20 | 0.16-0.22 | 0.16-0.22 |
| | | | | | |
| | | | | | |

Recommended Cutting Conditions



Machining data for SPADE-RUSH

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | |
|-----------|--|------------------------------|---------------------------------------|-------------|--------------|--------------------------|--------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 | 80-140 |
| | | ≥0.25%C | Annealed | 650 | 190 | 2 | 80-130 |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 | 80-120 |
| | | ≥0.55%C | Annealed | 750 | 220 | 4 | 70-110 |
| | | Quenched and tempered | 1000 | 300 | 5 | 50-90 | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | Quenched and tempered | 600 | 200 | 6 | 80-120 | |
| | | | 930 | 275 | 7 | 70-110 | |
| | | | 1000 | 300 | 8 | 50-90 | |
| | | | 1200 | 350 | 9 | 40-70 | |
| | High alloy steel, cast steel and tool steel | Annealed | 680 | 200 | 10 | 50-90 | |
| | | Quenched and tempered | 1100 | 325 | 11 | 40-80 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | 40-70 | |
| | | Martensitic | 820 | 240 | 13 | 40-70 | |
| | | Austenitic | 600 | 180 | 14 | 30-70 | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | 90-180 | |
| | | Pearlitic | | 250 | 16 | 80-140 | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | 90-165 | |
| | | Pearlitic | | 260 | 18 | 80-140 | |
| | Malleable cast iron | Ferritic | | 130 | 19 | 90-160 | |
| Pearlitic | | | 230 | 20 | 80-140 | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | 90-220 | |
| | | Cured | | 100 | 22 | 90-220 | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 | 90-220 |
| | | Cured | | 90 | 24 | 90-220 | |
| | | >12% Si | High temp. | | 130 | 25 | 80-160 |
| | Copper alloys | >1% Pb | Free cutting | | 110 | 26 | 90-220 |
| | | Brass | | | 90 | 27 | 90-220 |
| | | Electrolytic copper | | | 100 | 28 | 90-220 |
| | Non-metallic | Duroplastics, fiber plastics | | | | 29 | |
| | | Hard rubber | | | | 30 | |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 | 30-60 |
| | | | Cured | | 280 | 32 | 20-50 |
| | | Ni or Co based | Annealed | | 250 | 33 | 20-50 |
| | | | Cured | | 350 | 34 | 20-50 |
| | | | Cast | | 320 | 35 | 20-50 |
| | Titanium, Ti alloys | | Rm 400 | | 36 | 20-50 | |
| | | Alpha+beta alloys cured | Rm 1050 | | 37 | 20-50 | |
| H | Hardened steel | Hardened | | 55HRC | 38 | 20-50 | |
| | | Hardened | | 60HRC | 39 | 20-50 | |
| | Chilled cast iron | Cast | | 400 | 40 | | |
| | Cast iron nodular | Hardened | | 55HRC | 41 | | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions



Machining data for SPADE-RUSH

| Feed (mm/rev) vs. drill diameter | | | |
|----------------------------------|-------------|-------------|-----------|
| Ø20 - Ø25.9 | Ø26 - Ø29.9 | Ø30 - Ø34.9 | Ø35 - Ø41 |
| 0.30-0.50 | 0.30-0.50 | 0.30-0.50 | 0.35-0.55 |
| 0.30-0.50 | 0.30-0.50 | 0.30-0.50 | 0.35-0.55 |
| 0.30-0.50 | 0.30-0.50 | 0.30-0.50 | 0.35-0.55 |
| 0.30-0.50 | 0.30-0.50 | 0.30-0.50 | 0.35-0.55 |
| 0.30-0.50 | 0.30-0.50 | 0.30-0.50 | 0.35-0.55 |
| 0.25-0.45 | 0.25-0.45 | 0.25-0.45 | 0.30-0.50 |
| 0.25-0.45 | 0.25-0.45 | 0.25-0.45 | 0.30-0.50 |
| 0.25-0.45 | 0.25-0.45 | 0.25-0.45 | 0.30-0.50 |
| 0.25-0.45 | 0.25-0.45 | 0.25-0.45 | 0.30-0.50 |
| 0.25-0.35 | 0.25-0.35 | 0.25-0.35 | 0.30-0.40 |
| 0.25-0.35 | 0.25-0.35 | 0.25-0.35 | 0.30-0.40 |
| 0.15-0.30 | 0.15-0.30 | 0.15-0.30 | 0.20-0.35 |
| 0.15-0.30 | 0.15-0.30 | 0.15-0.30 | 0.20-0.35 |
| 0.15-0.30 | 0.15-0.30 | 0.15-0.30 | 0.20-0.35 |
| 0.35-0.55 | 0.35-0.55 | 0.35-0.55 | 0.40-0.60 |
| 0.35-0.55 | 0.35-0.55 | 0.35-0.55 | 0.40-0.60 |
| 0.35-0.55 | 0.35-0.55 | 0.35-0.55 | 0.40-0.60 |
| 0.35-0.55 | 0.35-0.55 | 0.35-0.55 | 0.40-0.60 |
| 0.35-0.55 | 0.35-0.55 | 0.35-0.55 | 0.40-0.60 |
| 0.40-0.60 | 0.40-0.60 | 0.40-0.60 | 0.50-0.70 |
| 0.40-0.60 | 0.40-0.60 | 0.40-0.60 | 0.50-0.70 |
| 0.40-0.60 | 0.40-0.60 | 0.40-0.60 | 0.50-0.70 |
| 0.40-0.60 | 0.40-0.60 | 0.40-0.60 | 0.50-0.70 |
| 0.40-0.60 | 0.40-0.60 | 0.40-0.60 | 0.50-0.70 |
| 0.40-0.60 | 0.40-0.60 | 0.40-0.60 | 0.50-0.70 |
| 0.40-0.60 | 0.40-0.60 | 0.40-0.60 | 0.50-0.70 |
| 0.40-0.60 | 0.40-0.60 | 0.40-0.60 | 0.50-0.70 |
| 0.40-0.60 | 0.40-0.60 | 0.40-0.60 | 0.50-0.70 |
| 0.10-0.20 | 0.10-0.20 | 0.15-0.25 | 0.15-0.25 |
| 0.10-0.20 | 0.10-0.20 | 0.15-0.25 | 0.15-0.25 |
| 0.10-0.20 | 0.10-0.20 | 0.15-0.25 | 0.15-0.25 |
| 0.10-0.20 | 0.10-0.20 | 0.15-0.25 | 0.15-0.25 |
| 0.10-0.20 | 0.10-0.20 | 0.15-0.25 | 0.15-0.25 |
| 0.10-0.20 | 0.10-0.20 | 0.15-0.25 | 0.15-0.25 |
| 0.10-0.20 | 0.10-0.20 | 0.15-0.25 | 0.15-0.25 |
| 0.10-0.20 | 0.10-0.20 | 0.15-0.25 | 0.15-0.25 |
| 0.10-0.20 | 0.10-0.20 | 0.15-0.25 | 0.15-0.25 |
| 0.10-0.20 | 0.10-0.20 | 0.15-0.25 | 0.15-0.25 |
| 0.10-0.20 | 0.10-0.20 | 0.15-0.25 | 0.15-0.25 |
| 0.10-0.20 | 0.10-0.20 | 0.15-0.25 | 0.15-0.25 |

Recommended Cutting Conditions

Machining data for SOLID-3-DRILL

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | | |
|-------------------------|--|------------------------|---------------------------------------|-------------|--------------|--------------------------|--------|--------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 | 80-140 | |
| | | >=0.25%C | Annealed | 650 | 190 | 2 | 80-130 | |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 | 80-120 | |
| | | >=0.55%C | Annealed | 750 | 220 | 4 | 70-110 | |
| | | | Quenched and tempered | 1000 | 300 | 5 | 50-90 | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | | Annealed | | 600 | 200 | 6 | 80-120 |
| | | | | | 930 | 275 | 7 | 70-110 |
| | | | Quenched and tempered | | 1000 | 300 | 8 | 50-90 |
| | | | | | 1200 | 350 | 9 | 40-70 |
| | High alloy steel, cast steel and tool steel | | Annealed | 680 | 200 | 10 | 50-90 | |
| | | | Quenched and tempered | 1100 | 325 | 11 | 40-80 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | | | |
| | | Martensitic | 820 | 240 | 13 | | | |
| | | Austenitic | 600 | 180 | 14 | | | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | 80-140 | | |
| | | Pearlitic | | 250 | 16 | 70-120 | | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | 80-120 | | |
| | | Pearlitic | | 260 | 18 | 70-110 | | |
| | Malleable cast iron | Ferritic | | 130 | 19 | 80-120 | | |
| Pearlitic | | | 230 | 20 | 70-110 | | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | | | |
| | | Cured | | 100 | 22 | | | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 | | |
| | | | Cured | | 90 | 24 | | |
| | | >12% Si | High temp. | | 130 | 25 | | |
| | Copper alloys | >1% Pb | Free cutting | | 110 | 26 | | |
| | | | Brass | | 90 | 27 | | |
| | | | Electrolytic copper | | 100 | 28 | | |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 | | |
| | | | Hard rubber | | | | 30 | |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 | | |
| | | | Cured | | 280 | 32 | | |
| | | Ni or Co based | Annealed | | 250 | 33 | | |
| | | | Cured | | 350 | 34 | | |
| | | | Cast | | 320 | 35 | | |
| | Titanium, Ti alloys | | | Rm 400 | | 36 | | |
| Alpha+beta alloys cured | | | Rm 1050 | | 37 | | | |
| H | Hardened steel | Hardened | | 55HRC | 38 | | | |
| | | Hardened | | 60HRC | 39 | | | |
| | Chilled cast iron | Cast | | 400 | 40 | | | |
| | Cast iron nodular | Hardened | | 55HRC | 41 | | | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions



Machining data for H-DRILL

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | | |
|-----------|--|-------------------------|---------------------------------------|-------------|--------------|--------------------------|--------|-------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 | 80-120 | |
| | | >=0.25%C | Annealed | 650 | 190 | 2 | 80-110 | |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 | 70-100 | |
| | | >=0.55%C | Annealed | 750 | 220 | 4 | 70-100 | |
| | | | Quenched and tempered | 1000 | 300 | 5 | 70-100 | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | | Annealed | | 600 | 200 | 6 | 70-90 |
| | | | | | 930 | 275 | 7 | 70-90 |
| | | | Quenched and tempered | | 1000 | 300 | 8 | 50-80 |
| | | | | | 1200 | 350 | 9 | 40-70 |
| | High alloy steel, cast steel and tool steel | | Annealed | 680 | 200 | 10 | 50-80 | |
| | | | Quenched and tempered | 1100 | 325 | 11 | 40-70 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | 30-60 | | |
| | | Martensitic | 820 | 240 | 13 | 30-60 | | |
| | | Austenitic | 600 | 180 | 14 | 30-60 | | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | 65-80 | | |
| | | Pearlitic | | 250 | 16 | 65-80 | | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | 85-105 | | |
| | | Pearlitic | | 260 | 18 | 75-90 | | |
| | Malleable cast iron | Ferritic | | 130 | 19 | 65-80 | | |
| Pearlitic | | | 230 | 20 | 65-80 | | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | 70-200 | | |
| | | Cured | | 100 | 22 | 70-200 | | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 | 70-200 | |
| | | | Cured | | 90 | 24 | 70-200 | |
| | | >12% Si | High temp. | | 130 | 25 | 70-150 | |
| | Copper alloys | >1% Pb | Free cutting | | 110 | 26 | 70-200 | |
| | | | Brass | | 90 | 27 | 70-200 | |
| | | | Electrolitic copper | | 100 | 28 | 70-200 | |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 | | |
| | | | Hard rubber | | | 30 | | |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 | 15-40 | |
| | | | Cured | | 280 | 32 | 15-40 | |
| | | Ni or Co based | Annealed | | 250 | 33 | 15-40 | |
| | | | Cured | | 350 | 34 | 15-40 | |
| | | | Cast | | 320 | 35 | 15-40 | |
| | Titanium, Ti alloys | | Rm 400 | | 36 | | | |
| | | Alpha+beta alloys cured | Rm 1050 | | 37 | | | |
| H | Hardened steel | Hardened | | 55HRC | 38 | 10-40 | | |
| | | Hardened | | 60HRC | 39 | 10-40 | | |
| | Chilled cast iron | Cast | | 400 | 40 | | | |
| | Cast iron nodular | Hardened | | 55HRC | 41 | | | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions



Machining data for H-DRILL

| Feed (mm/rev) vs. drill diameter | | |
|----------------------------------|-----------|------------|
| Ø3 - Ø5 | Ø5.1 - Ø8 | Ø8.1 - Ø12 |
| 0.10-0.20 | 0.15-0.25 | 0.20-0.30 |
| 0.10-0.20 | 0.15-0.25 | 0.20-0.30 |
| 0.10-0.20 | 0.15-0.25 | 0.20-0.30 |
| 0.10-0.20 | 0.15-0.25 | 0.20-0.30 |
| 0.10-0.20 | 0.15-0.25 | 0.20-0.30 |
| 0.10-0.20 | 0.15-0.25 | 0.20-0.30 |
| 0.10-0.20 | 0.15-0.25 | 0.20-0.30 |
| 0.10-0.20 | 0.15-0.25 | 0.20-0.30 |
| 0.10-0.20 | 0.15-0.25 | 0.20-0.30 |
| 0.08-0.18 | 0.10-0.20 | 0.15-0.25 |
| 0.08-0.18 | 0.10-0.20 | 0.15-0.25 |
| 0.06-0.12 | 0.10-0.15 | 0.12-0.18 |
| 0.06-0.12 | 0.10-0.15 | 0.12-0.18 |
| 0.06-0.12 | 0.10-0.15 | 0.12-0.18 |
| 0.10-0.20 | 0.15-0.25 | 0.20-0.30 |
| 0.10-0.20 | 0.15-0.25 | 0.20-0.30 |
| 0.10-0.20 | 0.15-0.25 | 0.20-0.30 |
| 0.10-0.20 | 0.15-0.25 | 0.20-0.30 |
| 0.10-0.20 | 0.15-0.25 | 0.20-0.30 |
| 0.10-0.25 | 0.15-0.35 | 0.25-0.45 |
| 0.10-0.25 | 0.15-0.35 | 0.25-0.45 |
| 0.10-0.25 | 0.15-0.35 | 0.25-0.45 |
| 0.10-0.25 | 0.15-0.35 | 0.25-0.45 |
| 0.10-0.25 | 0.15-0.35 | 0.25-0.45 |
| 0.08-0.18 | 0.15-0.25 | 0.20-0.35 |
| 0.08-0.18 | 0.15-0.25 | 0.20-0.35 |
| 0.08-0.18 | 0.15-0.25 | 0.20-0.35 |
| | | |
| | | |
| 0.02-0.08 | 0.04-0.10 | 0.06-0.12 |
| 0.02-0.08 | 0.04-0.10 | 0.06-0.12 |
| 0.02-0.08 | 0.04-0.10 | 0.06-0.12 |
| 0.02-0.08 | 0.04-0.10 | 0.06-0.12 |
| 0.02-0.08 | 0.04-0.10 | 0.06-0.12 |
| | | |
| | | |
| 0.02-0.08 | 0.04-0.10 | 0.06-0.12 |
| 0.02-0.08 | 0.04-0.10 | 0.06-0.12 |
| | | |
| | | |

Recommended Cutting Conditions



Machining data for TOP-CAP

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | |
|-----|--|------------------------|---------------------------------------|-------------|--------------|----|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 |
| | | >=0.25%C | Annealed | 650 | 190 | 2 |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 |
| | | >=0.55%C | Annealed | 750 | 220 | 4 |
| | | | Quenched and tempered | 1000 | 300 | 5 |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | | Annealed | 600 | 200 | 6 |
| | | | Quenched and tempered | 930 | 275 | 7 |
| | | | | 1000 | 300 | 8 |
| | | | | 1200 | 350 | 9 |
| | High alloy steel, cast steel and tool steel | | Annealed | 680 | 200 | 10 |
| | | | Quenched and tempered | 1100 | 325 | 11 |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | |
| | | Martensitic | 820 | 240 | 13 | |
| | | Austenitic | 600 | 180 | 14 | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | |
| | | Pearlitic | | 250 | 16 | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | |
| | | Pearlitic | | 260 | 18 | |
| | Malleable cast iron | Ferritic | | 130 | 19 | |
| | Pearlitic | | 230 | 20 | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | |
| | | Cured | | 100 | 22 | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 |
| | | | Cured | | 90 | 24 |
| | | >12% Si | High temp. | | 130 | 25 |
| | Copper alloys | >1% Pb | Free cutting | | 110 | 26 |
| | | | Brass | | 90 | 27 |
| | | | Electrolitic copper | | 100 | 28 |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 |
| | | | Hard rubber | | | 30 |
| S | High temp. alloys | Fe based | Annealed | 200 | 31 | |
| | | | Cured | 280 | 32 | |
| | | Ni or Co based | Annealed | 250 | 33 | |
| | | | Cured | 350 | 34 | |
| | | | Cast | 320 | 35 | |
| | Titanium, Ti alloys | | | Rm 400 | | 36 |
| | | | Alpha+beta alloys cured | Rm 1050 | | 37 |
| H | Hardened steel | Hardened | | 55HRC | 38 | |
| | | Hardened | | 60HRC | 39 | |
| | Chilled cast iron | Cast | | 400 | 40 | |
| | Cast iron nodular | Hardened | | 55HRC | 41 | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions



Machining data for TOP-CAP

| Drilling | | Turning & boring | | Grooving | |
|------------|---------------|------------------|---------------|------------|---------------|
| Vc (m/min) | Feed (mm/rev) | Vc (m/min) | Feed (mm/rev) | Vc (m/min) | Feed (mm/rev) |
| 120-260 | 0.05-0.06 | 140-280 | 0.04-0.14 | 120-250 | 0.04-0.25 |
| 80-190 | 0.05-0.15 | 90-200 | 0.04-0.12 | 80-180 | 0.04-0.25 |
| 100-280 | 0.06-0.18 | 100-200 | 0.04-0.15 | 80-180 | 0.04-0.25 |
| 100-280 | 0.06-0.18 | 100-200 | 0.04-0.15 | 80-180 | 0.04-0.25 |
| 100-280 | 0.06-0.18 | 100-200 | 0.04-0.15 | 80-180 | 0.04-0.25 |
| 100-280 | 0.06-0.18 | 100-200 | 0.04-0.15 | 80-180 | 0.04-0.25 |
| 60-180 | 0.04-0.15 | 80-180 | 0.07-0.12 | 60-160 | 0.04-0.25 |
| 60-180 | 0.04-0.15 | 80-180 | 0.07-0.12 | 60-160 | 0.04-0.25 |
| 60-180 | 0.04-0.15 | 80-180 | 0.07-0.12 | 60-160 | 0.04-0.25 |
| 80-190 | 0.05-0.15 | 80-200 | 0.04-0.12 | 80-160 | 0.04-0.25 |
| 50-150 | 0.04-0.14 | 60-150 | 0.04-0.12 | 50-120 | 0.04-0.25 |
| 50-210 | 0.04-0.15 | 60-230 | 0.07-0.12 | 50-200 | 0.04-0.25 |
| 50-210 | 0.04-0.15 | 60-230 | 0.07-0.12 | 50-200 | 0.04-0.25 |
| 50-210 | 0.04-0.15 | 60-230 | 0.07-0.12 | 50-200 | 0.04-0.25 |
| 100-300 | 0.06-0.23 | 120-230 | 0.07-0.2 | 100-200 | 0.04-0.25 |
| 100-300 | 0.06-0.23 | 120-230 | 0.07-0.2 | 100-200 | 0.04-0.25 |
| 100-300 | 0.06-0.23 | 120-230 | 0.07-0.2 | 100-200 | 0.04-0.25 |
| 100-300 | 0.06-0.23 | 120-230 | 0.07-0.2 | 100-200 | 0.04-0.25 |
| 100-200 | 0.06-0.15 | 120-230 | 0.04-0.13 | 100-200 | 0.04-0.25 |
| 100-200 | 0.06-0.15 | 120-230 | 0.04-0.13 | 100-200 | 0.04-0.25 |
| 120-500 | 0.05-0.3 | 120-700 | 0.04-0.25 | 100-700 | 0.04-0.25 |
| 120-500 | 0.05-0.3 | 120-700 | 0.04-0.25 | 100-700 | 0.04-0.25 |
| 120-500 | 0.05-0.3 | 120-700 | 0.04-0.25 | 100-700 | 0.04-0.25 |
| 120-500 | 0.05-0.3 | 120-700 | 0.04-0.25 | 100-700 | 0.04-0.25 |
| 80-380 | 0.05-0.23 | 80-500 | 0.04-0.2 | 80-350 | 0.04-0.25 |
| 80-380 | 0.05-0.23 | 80-500 | 0.04-0.2 | 80-350 | 0.04-0.25 |
| 80-380 | 0.05-0.23 | 80-500 | 0.04-0.2 | 80-350 | 0.04-0.25 |
| 50-140 | 0.04-0.14 | 50-160 | 0.04-0.12 | 50-140 | 0.04-0.25 |
| 50-140 | 0.04-0.14 | 50-160 | 0.04-0.12 | 50-140 | 0.04-0.25 |
| 20-50 | 0.04-0.05 | 20-80 | 0.04-0.05 | 20-50 | 0.04-0.05 |
| 20-50 | 0.04-0.05 | 20-80 | 0.04-0.05 | 20-50 | 0.04-0.05 |
| 20-50 | 0.04-0.05 | 20-80 | 0.04-0.05 | 20-50 | 0.04-0.05 |
| 20-50 | 0.04-0.05 | 20-80 | 0.04-0.05 | 20-50 | 0.04-0.05 |
| 20-50 | 0.04-0.05 | 20-80 | 0.04-0.05 | 20-50 | 0.04-0.05 |
| 30-60 | 0.04-0.05 | 30-100 | 0.04-0.05 | 30-80 | 0.04-0.05 |
| 30-60 | 0.04-0.05 | 30-100 | 0.04-0.05 | 30-80 | 0.04-0.05 |
| 20-40 | 0.04-0.05 | 20-70 | 0.04-0.05 | 20-50 | 0.04-0.05 |
| 20-40 | 0.04-0.05 | 20-70 | 0.04-0.05 | 20-50 | 0.04-0.05 |
| 20-40 | 0.04-0.05 | 20-70 | 0.04-0.05 | 20-50 | 0.04-0.05 |
| 20-40 | 0.04-0.05 | 20-70 | 0.04-0.05 | 20-50 | 0.04-0.05 |

Recommended Cutting Conditions



Machining data for TBTA 3/5/7/9 & TBTA-R

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | | |
|-----------|--|------------------------|---------------------------------------|-------------------------|--------------|--------------------------|--------|--------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 | 60-120 | |
| | | >=0.25%C | Annealed | 650 | 190 | 2 | 60-120 | |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 | 60-120 | |
| | | >=0.55%C | Annealed | 750 | 220 | 4 | 60-120 | |
| | | | Quenched and tempered | 1000 | 300 | 5 | 50-100 | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | | Annealed | | 600 | 200 | 6 | 50-100 |
| | | | | | 930 | 275 | 7 | 50-100 |
| | | | Quenched and tempered | | 1000 | 300 | 8 | 50-100 |
| | | | | | 1200 | 350 | 9 | 50-100 |
| | High alloy steel, cast steel and tool steel | | Annealed | 680 | 200 | 10 | 60-120 | |
| | | | Quenched and tempered | 1100 | 325 | 11 | 60-120 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | 60-110 | | |
| | | Martensitic | 820 | 240 | 13 | 60-110 | | |
| | | Austenitic | 600 | 180 | 14 | 60-110 | | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | 60-100 | | |
| | | Pearlitic | | 250 | 16 | 60-100 | | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | 60-100 | | |
| | | Pearlitic | | 260 | 18 | 60-100 | | |
| | Malleable cast iron | Ferritic | | 130 | 19 | 60-100 | | |
| Pearlitic | | | 230 | 20 | 60-100 | | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | 60-130 | | |
| | | Cured | | 100 | 22 | 60-130 | | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 | 60-130 | |
| | | | Cured | | 90 | 24 | 60-130 | |
| | | >12% Si | High temp. | | 130 | 25 | 60-130 | |
| | Copper alloys | | >1% Pb | Free cutting | | 110 | 26 | 60-130 |
| | | | | Brass | | 90 | 27 | 60-130 |
| | | | | Electrolitic copper | | 100 | 28 | 60-130 |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 | | |
| | | | Hard rubber | | | 30 | | |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 | 20-65 | |
| | | | Cured | | 280 | 32 | 20-65 | |
| | | Ni or Co based | Annealed | | 250 | 33 | 20-65 | |
| | | | Cured | | 350 | 34 | 20-65 | |
| | | | Cast | | 320 | 35 | 20-65 | |
| | Titanium, Ti alloys | | | Rm 400 | | 36 | 30-100 | |
| | | | | Alpha+beta alloys cured | Rm 1050 | | 37 | 30-100 |
| H | Hardened steel | | Hardened | | 55HRC | 38 | | |
| | | | Hardened | | 60HRC | 39 | | |
| | Chilled cast iron | Cast | | 400 | | 40 | | |
| | Cast iron nodular | Hardened | | | 55HRC | 41 | | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions



Machining data for TBTA 3/5/7/9 & TBTA-R

Feed (mm/rev) vs. drill diameter

| Ø38.00 - Ø39.99 | Ø40.00 - Ø51.99 | Ø52.00 - Ø63.99 | Ø64.00 - Ø84.99 | Ø85.00 - |
|-----------------|-----------------|-----------------|-----------------|-----------|
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.13 | 0.10-0.15 | 0.13-0.18 | 0.15-0.20 | 0.18-0.23 |
| 0.08-0.13 | 0.10-0.15 | 0.13-0.18 | 0.15-0.20 | 0.18-0.23 |
| 0.08-0.13 | 0.10-0.15 | 0.13-0.18 | 0.15-0.20 | 0.18-0.23 |
| 0.08-0.13 | 0.10-0.15 | 0.13-0.18 | 0.15-0.20 | 0.18-0.23 |
| 0.08-0.13 | 0.10-0.15 | 0.13-0.18 | 0.15-0.20 | 0.18-0.23 |
| 0.08-0.13 | 0.10-0.15 | 0.13-0.18 | 0.15-0.20 | 0.18-0.23 |
| 0.08-0.20 | 0.10-0.25 | 0.13-0.28 | 0.15-0.30 | 0.18-0.33 |
| 0.08-0.20 | 0.10-0.25 | 0.13-0.28 | 0.15-0.30 | 0.18-0.33 |
| 0.08-0.20 | 0.10-0.25 | 0.13-0.28 | 0.15-0.30 | 0.18-0.33 |
| 0.08-0.20 | 0.10-0.25 | 0.13-0.28 | 0.15-0.30 | 0.18-0.33 |
| 0.08-0.20 | 0.10-0.25 | 0.13-0.28 | 0.15-0.30 | 0.18-0.33 |
| 0.08-0.20 | 0.10-0.25 | 0.13-0.28 | 0.15-0.30 | 0.18-0.33 |
| 0.08-0.20 | 0.10-0.25 | 0.13-0.28 | 0.15-0.30 | 0.18-0.33 |
| | | | | |
| | | | | |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| 0.08-0.15 | 0.10-0.20 | 0.13-0.23 | 0.15-0.25 | 0.18-0.30 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Recommended Cutting Conditions



Machining data for TBTA-FB

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | | |
|-----------|--|------------------------|---------------------------------------|-------------|--------------|--------------------------|--------|--------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 | 70-130 | |
| | | >=0.25%C | Annealed | 650 | 190 | 2 | 70-130 | |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 | 70-130 | |
| | | >=0.55%C | Annealed | 750 | 220 | 4 | 70-130 | |
| | | | Quenched and tempered | 1000 | 300 | 5 | 70-130 | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | | Annealed | | 600 | 200 | 6 | 70-120 |
| | | | | | 930 | 275 | 7 | 60-120 |
| | | | Quenched and tempered | | 1000 | 300 | 8 | 60-120 |
| | | | | | 1200 | 350 | 9 | 60-120 |
| | High alloy steel, cast steel and tool steel | | Annealed | 680 | 200 | 10 | 70-130 | |
| | | | Quenched and tempered | 1100 | 325 | 11 | 70-130 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | 70-130 | | |
| | | Martensitic | 820 | 240 | 13 | 70-130 | | |
| | | Austenitic | 600 | 180 | 14 | 70-130 | | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | 60-110 | | |
| | | Pearlitic | | 250 | 16 | 60-110 | | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | 50-110 | | |
| | | Pearlitic | | 260 | 18 | 50-110 | | |
| | Malleable cast iron | Ferritic | | 130 | 19 | 70-110 | | |
| Pearlitic | | | 230 | 20 | 70-110 | | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | 65-130 | | |
| | | Cured | | 100 | 22 | 65-130 | | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 | 65-130 | |
| | | | Cured | | 90 | 24 | 65-130 | |
| | | >12% Si | High temp. | | 130 | 25 | 65-130 | |
| | Copper alloys | >1% Pb | Free cutting | | 110 | 26 | 65-130 | |
| | | | Brass | | 90 | 27 | 65-130 | |
| | | | Electrolitic copper | | 100 | 28 | 65-130 | |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 | | |
| | | | Hard rubber | | | 30 | | |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 | 20-50 | |
| | | | Cured | | 280 | 32 | 20-50 | |
| | | Ni or Co based | Annealed | | 250 | 33 | 20-50 | |
| | | | Cured | | 350 | 34 | 20-50 | |
| | | | Cast | | 320 | 35 | 20-50 | |
| | Titanium, Ti alloys | | | Rm 400 | | 36 | 30-60 | |
| | | | Alpha+beta alloys cured | Rm 1050 | | 37 | 30-60 | |
| H | Hardened steel | Hardened | | 55HRC | 38 | | | |
| | | Hardened | | 60HRC | 39 | | | |
| | Chilled cast iron | Cast | | 400 | 40 | | | |
| | Cast iron nodular | Hardened | | 55HRC | 41 | | | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions



Machining data for BTA & BTS

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | |
|-----------|--|-------------------------|---------------------------------------|-------------|--------------|--------------------------|--------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 | 70-120 |
| | | ≥0.25%C | Annealed | 650 | 190 | 2 | 70-120 |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 | 40-70 |
| | | ≥0.55%C | Annealed | 750 | 220 | 4 | 70-120 |
| | | Quenched and tempered | 1000 | 300 | 5 | 55-100 | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | Quenched and tempered | 600 | 200 | 6 | 70-100 | |
| | | | 930 | 275 | 7 | 55-100 | |
| | | | 1000 | 300 | 8 | 55-100 | |
| | | | 1200 | 350 | 9 | 55-100 | |
| | High alloy steel, cast steel and tool steel | Annealed | 680 | 200 | 10 | 50-85 | |
| | | Quenched and tempered | 1100 | 325 | 11 | 55-100 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | 60-100 | |
| | | Martensitic | 820 | 240 | 13 | 60-100 | |
| | | Austenitic | 600 | 180 | 14 | 60-100 | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | 60-100 | |
| | | Pearlitic | | 250 | 16 | 60-100 | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | 80-100 | |
| | | Pearlitic | | 260 | 18 | 80-100 | |
| | Malleable cast iron | Ferritic | | 130 | 19 | 50-100 | |
| Pearlitic | | | 230 | 20 | 50-100 | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | 65-130 | |
| | | Cured | | 100 | 22 | 65-100 | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 | 65-130 |
| | | | Cured | | 90 | 24 | 65-130 |
| | | >12% Si | High temp. | | 130 | 25 | 65-130 |
| | Copper alloys | >1% Pb | Free cutting | | 110 | 26 | 65-130 |
| | | Brass | | | 90 | 27 | 65-130 |
| | | | Electrolytic copper | | 100 | 28 | 65-130 |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 | |
| | | | Hard rubber | | | 30 | |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 | 10-50 |
| | | | Cured | | 280 | 32 | 10-50 |
| | | Ni or Co based | Annealed | | 250 | 33 | 10-50 |
| | | | Cured | | 350 | 34 | 10-50 |
| | | | Cast | | 320 | 35 | 10-50 |
| | Titanium, Ti alloys | | Rm 400 | | 36 | 30-50 | |
| | | Alpha+beta alloys cured | Rm 1050 | | 37 | 30-50 | |
| H | Hardened steel | Hardened | | 55HRC | 38 | | |
| | | Hardened | | 60HRC | 39 | | |
| | Cast iron nodular | Cast | | 400 | 40 | | |
| | Cast iron nodular | Hardened | | 55HRC | 41 | | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions



Machining data for BTA & BTS

Feed (mm/rev) vs. drill diameter

| Ø8.00 - Ø20.00 | Ø15.60 - Ø20.00 | Ø20.01 - Ø31.00 | Ø31.01 - Ø43.00 | Ø43.01 - Ø65.00 |
|----------------|-----------------|-----------------|-----------------|-----------------|
| 0.05-0.13 | 0.08-0.15 | 0.10-0.17 | 0.13-0.20 | 0.16-0.30 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.17 | 0.13-0.20 | 0.16-0.30 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.17 | 0.13-0.20 | 0.16-0.30 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.17 | 0.13-0.20 | 0.16-0.30 |
| 0.05-0.10 | 0.08-0.12 | 0.10-0.15 | 0.13-0.17 | 0.15-0.28 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.17 | 0.13-0.20 | 0.16-0.30 |
| 0.05-0.10 | 0.08-0.12 | 0.10-0.15 | 0.13-0.17 | 0.15-0.28 |
| 0.05-0.10 | 0.08-0.12 | 0.10-0.15 | 0.13-0.17 | 0.15-0.28 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.17 | 0.13-0.20 | 0.16-0.30 |
| 0.05-0.10 | 0.08-0.12 | 0.10-0.15 | 0.13-0.17 | 0.15-0.28 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.28 | 0.13-0.30 | 0.16-0.35 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.28 | 0.13-0.30 | 0.16-0.35 |
| 0.05-0.12 | 0.05-0.12 | 0.08-0.25 | 0.10-0.28 | 0.15-0.33 |
| 0.05-0.13 | 0.06-0.13 | 0.08-0.18 | 0.10-0.20 | 0.15-0.25 |
| 0.05-0.13 | 0.06-0.13 | 0.08-0.18 | 0.10-0.20 | 0.15-0.25 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.17 | 0.13-0.20 | 0.16-0.30 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.17 | 0.13-0.20 | 0.16-0.30 |
| 0.05-0.13 | 0.06-0.13 | 0.08-0.18 | 0.10-0.20 | 0.15-0.25 |
| 0.05-0.13 | 0.06-0.13 | 0.08-0.18 | 0.10-0.20 | 0.15-0.25 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.20 | 0.15-0.25 | 0.16-0.30 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.20 | 0.15-0.25 | 0.16-0.30 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.20 | 0.15-0.25 | 0.16-0.30 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.20 | 0.15-0.25 | 0.16-0.30 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.20 | 0.15-0.25 | 0.16-0.30 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.20 | 0.15-0.25 | 0.16-0.30 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.20 | 0.15-0.25 | 0.16-0.30 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.20 | 0.15-0.25 | 0.16-0.30 |
| 0.05-0.13 | 0.08-0.15 | 0.10-0.20 | 0.15-0.25 | 0.16-0.30 |
| 0.05-0.12 | 0.06-0.12 | 0.08-0.15 | 0.12-0.18 | 0.15-0.25 |
| 0.05-0.12 | 0.06-0.12 | 0.08-0.15 | 0.12-0.18 | 0.15-0.25 |
| 0.05-0.12 | 0.06-0.12 | 0.08-0.15 | 0.12-0.18 | 0.15-0.25 |
| 0.05-0.12 | 0.06-0.12 | 0.08-0.15 | 0.12-0.18 | 0.15-0.25 |
| 0.05-0.12 | 0.06-0.12 | 0.08-0.15 | 0.12-0.18 | 0.15-0.25 |
| 0.05-0.10 | 0.05-0.10 | 0.08-0.12 | 0.10-0.15 | 0.12-0.20 |
| 0.05-0.10 | 0.05-0.10 | 0.08-0.12 | 0.10-0.15 | 0.12-0.20 |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Recommended Cutting Conditions



Machining data for TRGD / TRGDL / TBTA-TR

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | |
|-----|--|------------------------|---------------------------------------|-------------|--------------|----|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 |
| | | ≥0.25%C | Annealed | 650 | 190 | 2 |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 |
| | | ≥0.55%C | Annealed | 750 | 220 | 4 |
| | | | Quenched and tempered | 1000 | 300 | 5 |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | Annealed | | 600 | 200 | 6 |
| | | | | 930 | 275 | 7 |
| | | Quenched and tempered | | 1000 | 300 | 8 |
| | | | | 1200 | 350 | 9 |
| | High alloy steel, cast steel and tool steel | Annealed | 680 | 200 | 10 | |
| | | Quenched and tempered | 1100 | 325 | 11 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | |
| | | Martensitic | 820 | 240 | 13 | |
| | | Austenitic | 600 | 180 | 14 | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | |
| | | Pearlitic | | 250 | 16 | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | |
| | | Pearlitic | | 260 | 18 | |
| | Malleable cast iron | Ferritic | | 130 | 19 | |
| | Pearlitic | | 230 | 20 | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | |
| | | Cured | | 100 | 22 | |
| | Aluminum-cast, alloyed | ≤12% Si | Not cureable | | 75 | 23 |
| | | | Cured | | 90 | 24 |
| | | >12% Si | High temp. | | 130 | 25 |
| | Copper alloys | >1% Pb | Free cutting | | 110 | 26 |
| | | | Brass | | 90 | 27 |
| | | | Electrolitic copper | | 100 | 28 |
| | Non-metallic | | Duroplastics, fiber plastics | | | 29 |
| | | | Hard rubber | | | 30 |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 |
| | | | Cured | | 280 | 32 |
| | | Ni or Co based | Annealed | | 250 | 33 |
| | | | Cured | | 350 | 34 |
| | | | Cast | | 320 | 35 |
| | Titanium, Ti alloys | | Rm 400 | | | 36 |
| | | | Alpha+beta alloys cured | Rm 1050 | | |
| H | Hardened steel | Hardened | | 55 HRC | 38 | |
| | | Hardened | | 60 HRC | 39 | |
| | Chilled cast iron | Cast | | 400 | 40 | |
| | Cast iron nodular | Hardened | | 55 HRC | 41 | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions



Machining data for TRGD / TRGDL / TBTA-TR

| Feed (mm/rev) vs. drill diameter | | | | | |
|----------------------------------|---------------|---------------|---------------|-----------------------------|---------------|
| TRGD / TRGDL | | | TBTA-TR | | |
| Cutting speed Vc (m/min) | Ø14.00-Ø15.99 | Ø16.00-Ø28.00 | Ø28.01-Ø40.00 | Cutting speed Vc (m/min) | Ø16.00-Ø28.00 |
| 80-140 | 0.05-0.10 | 0.05-0.10 | 0.05-0.15 | 90-130 | 0.15-0.20 |
| 80-140 | 0.05-0.10 | 0.05-0.10 | 0.05-0.15 | 90-130 | 0.15-0.20 |
| 80-140 | 0.05-0.16 | 0.05-0.20 | 0.05-0.20 | 90-130 | 0.15-0.20 |
| 80-140 | 0.05-0.16 | 0.05-0.20 | 0.05-0.20 | 70-130 | 0.10-0.25 |
| 80-140 | 0.05-0.16 | 0.05-0.20 | 0.05-0.20 | 70-130 | 0.10-0.25 |
| 80-140 | 0.05-0.10 | 0.05-0.10 | 0.05-0.15 | 70-120 | 0.10-0.25 |
| 80-120 | 0.05-0.16 | 0.05-0.20 | 0.05-0.20 | 60-120 | 0.10-0.25 |
| 80-120 | 0.05-0.16 | 0.05-0.20 | 0.05-0.20 | 60-120 | 0.10-0.25 |
| 80-120 | 0.05-0.16 | 0.05-0.20 | 0.05-0.20 | 60-120 | 0.10-0.25 |
| 80-140 | 0.05-0.10 | 0.05-0.10 | 0.05-0.15 | 70-130 | 0.10-0.25 |
| 80-120 | 0.05-0.16 | 0.05-0.20 | 0.05-0.20 | 70-130 | 0.10-0.25 |
| 60-100 | 0.05-0.10 | 0.05-0.10 | 0.05-0.15 | 80-130 | 0.06-0.10 |
| 60-100 | 0.05-0.10 | 0.05-0.10 | 0.05-0.15 | 80-130 | 0.06-0.10 |
| 60-100 | 0.05-0.10 | 0.05-0.10 | 0.05-0.15 | 80-130 | 0.06-0.10 |
| 80-140 | 0.05-0.25 | 0.05-0.30 | 0.05-0.30 | 50-110 | 0.10-0.20 |
| 80-140 | 0.05-0.25 | 0.05-0.30 | 0.05-0.30 | 50-110 | 0.10-0.20 |
| 80-140 | 0.05-0.25 | 0.05-0.30 | 0.05-0.30 | 60-110 | 0.10-0.20 |
| 80-140 | 0.05-0.25 | 0.05-0.30 | 0.05-0.30 | 60-110 | 0.10-0.20 |
| 80-140 | 0.05-0.25 | 0.05-0.30 | 0.05-0.30 | 70-110 | 0.10-0.20 |
| 80-140 | 0.05-0.25 | 0.05-0.30 | 0.05-0.30 | 70-110 | 0.10-0.20 |
| 100-200 | 0.05-0.20 | 0.05-0.20 | 0.05-0.25 | 65-130 | 0.08-0.18 |
| 100-200 | 0.05-0.20 | 0.05-0.20 | 0.05-0.25 | 65-130 | 0.08-0.18 |
| 100-200 | 0.05-0.20 | 0.05-0.20 | 0.05-0.25 | 65-130 | 0.08-0.18 |
| | | | | 65-130 | 0.08-0.18 |
| | | | | 65-130 | 0.08-0.18 |
| | | | | 65-130 | 0.08-0.18 |
| | | | | 65-130 | 0.08-0.18 |
| | | | | 65-130 | 0.08-0.18 |
| | | | | 65-130 | 0.08-0.18 |
| 20-50 | 0.04-0.08 | 0.04-0.10 | 0.04-0.13 | 20-50 | 0.08-0.18 |
| 20-50 | 0.04-0.08 | 0.04-0.10 | 0.04-0.13 | 20-50 | 0.08-0.18 |
| 20-50 | 0.04-0.08 | 0.04-0.10 | 0.04-0.13 | 20-50 | 0.08-0.18 |
| 20-50 | 0.04-0.08 | 0.04-0.10 | 0.04-0.13 | 20-50 | 0.08-0.18 |
| 20-50 | 0.04-0.08 | 0.04-0.10 | 0.04-0.13 | 20-50 | 0.08-0.18 |
| 30-60 | 0.05-0.13 | 0.05-0.15 | 0.05-0.18 | 30-60 | 0.08-0.18 |
| 30-60 | 0.05-0.13 | 0.05-0.15 | 0.05-0.18 | 30-60 | 0.08-0.18 |
| 50-100 | 0.04-0.08 | 0.04-0.10 | 0.04-0.13 | | |
| 50-100 | 0.04-0.08 | 0.04-0.10 | 0.04-0.13 | | |
| 50-100 | 0.04-0.08 | 0.04-0.10 | 0.04-0.13 | | |
| 50-100 | 0.04-0.08 | 0.04-0.10 | 0.04-0.13 | | |

Reaming Tools



TM...KEY

Clamping keys

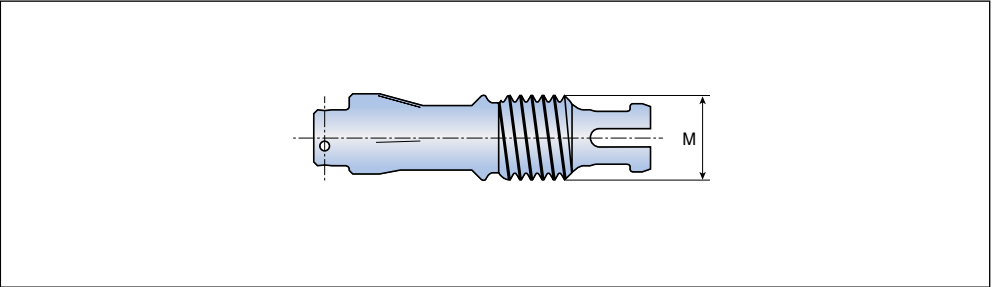


| Designation | Clamping key | |
|--------------------|--------------------------|-----|
| | Head diameter range (mm) | SSC |
| TM - B5-KEY | 11.501-13.500 | B5 |
| B6-KEY | 13.501-16.000 | B6 |
| B7-KEY | 16.001-20.000 | B7 |
| B8-KEY | 20.001-25.400 | B8 |
| B9-KEY | 25.401-32.000 | B9 |
| | | |
| | | |

• SSC: Seat size code

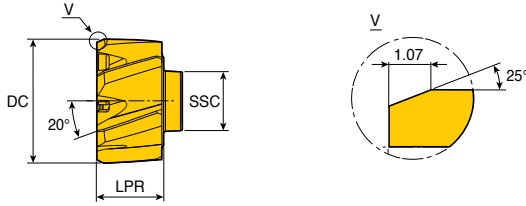
TM...SCR

Clamping screws



| Designation | Clamping screw | |
|--------------------|--------------------------|----|
| | Head diameter range (mm) | M |
| TM - B5-SCR | 11.501-13.500 | M5 |
| B6-SCR | 13.501-16.000 | M6 |
| B7-SCR | 16.001-20.000 | M7 |
| B8-SCR | 20.001-25.400 | M8 |
| B9-SCR | 25.401-32.000 | M9 |
| | | |
| | | |

Head changeable reamer heads



- Left-handed flute for through hole
- For H7 hole tolerance

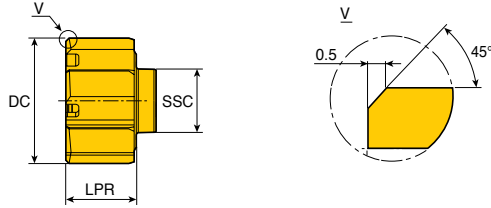
| Head | Designation | Dimension (mm) | | NOF | SSC | Flute type | Edge type | Grade | |
|------|--------------------------|----------------|------|-----|-----|------------|-----------|-------|--|
| | | DC | LPR | | | | | | |
| | TM - 11.501-BL-B5 | 11.501 | 9.5 | 6 | B5 | L | B | ● | |
| | 12.000-BL-B5 | 12.000 | 9.5 | 6 | B5 | L | B | ● | |
| | 13.000-BL-B5 | 13.000 | 9.5 | 6 | B5 | L | B | ● | |
| | 13.500-BL-B5 | 13.500 | 9.5 | 6 | B5 | L | B | ● | |
| | 13.501-BL-B6 | 13.501 | 9.5 | 6 | B6 | L | B | ● | |
| | 14.000-BL-B6 | 14.000 | 9.5 | 6 | B6 | L | B | ● | |
| | 15.000-BL-B6 | 15.000 | 9.5 | 6 | B6 | L | B | ● | |
| | 16.000-BL-B6 | 16.000 | 9.5 | 6 | B6 | L | B | ● | |
| | 16.001-BL-B7 | 16.001 | 10.7 | 6 | B7 | L | B | ● | |
| | 17.000-BL-B7 | 17.000 | 10.7 | 6 | B7 | L | B | ● | |
| | 18.000-BL-B7 | 18.000 | 10.7 | 6 | B7 | L | B | ● | |
| | 19.000-BL-B7 | 19.000 | 10.7 | 6 | B7 | L | B | ● | |
| | 20.000-BL-B7 | 20.000 | 10.7 | 6 | B7 | L | B | ● | |
| | 20.001-BL-B8 | 20.001 | 12.9 | 8 | B8 | L | B | ● | |
| | 21.000-BL-B8 | 21.000 | 12.9 | 8 | B8 | L | B | ● | |
| | 22.000-BL-B8 | 22.000 | 12.9 | 8 | B8 | L | B | ● | |
| | 23.000-BL-B8 | 23.000 | 12.9 | 8 | B8 | L | B | ● | |
| | 24.000-BL-B8 | 24.000 | 12.9 | 8 | B8 | L | B | ● | |
| | 25.000-BL-B8 | 25.000 | 12.9 | 8 | B8 | L | B | ● | |
| | 26.000-BL-B9 | 26.000 | 12.9 | 8 | B9 | L | B | ● | |
| | 27.000-BL-B9 | 27.000 | 12.9 | 8 | B9 | L | B | ● | |
| | 28.000-BL-B9 | 28.000 | 12.9 | 8 | B9 | L | B | ● | |
| | 29.000-BL-B9 | 29.000 | 12.9 | 8 | B9 | L | B | ● | |
| | 30.000-BL-B9 | 30.000 | 12.9 | 8 | B9 | L | B | ● | |
| | 31.000-BL-B9 | 31.000 | 12.9 | 8 | B9 | L | B | ● | |
| | 32.000-BL-B9 | 32.000 | 12.9 | 8 | B9 | L | B | ● | |
| | | | | | | | | | |
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- NOF: Number of flutes
- SSC: Seat size code

●: Standard items

Head changeable reamer heads



- Straight flute for blind hole
- For H7 hole tolerance

| Head | Designation | Dimension (mm) | | NOF | SSC | Flute type | Edge type | Grade TT9030 | |
|------|-------------------------|----------------|------|-----|-----|------------|-----------|-----------------|--|
| | | DC | LPR | | | | | | |
| | TM- 11.501-AS-B5 | 11.501 | 9.5 | 6 | B5 | S | A | ● | |
| | 12.000-AS-B5 | 12.000 | 9.5 | 6 | B5 | S | A | ● | |
| | 13.000-AS-B5 | 13.000 | 9.5 | 6 | B5 | S | A | ● | |
| | 13.500-AS-B5 | 13.500 | 9.5 | 6 | B5 | S | A | ● | |
| | 13.501-AS-B6 | 13.501 | 9.5 | 6 | B6 | S | A | ● | |
| | 14.000-AS-B6 | 14.000 | 9.5 | 6 | B6 | S | A | ● | |
| | 15.000-AS-B6 | 15.000 | 9.5 | 6 | B6 | S | A | ● | |
| | 16.000-AS-B6 | 16.000 | 9.5 | 6 | B6 | S | A | ● | |
| | 16.001-AS-B7 | 16.001 | 10.7 | 6 | B7 | S | A | ● | |
| | 17.000-AS-B7 | 17.000 | 10.7 | 6 | B7 | S | A | ● | |
| | 18.000-AS-B7 | 18.000 | 10.7 | 6 | B7 | S | A | ● | |
| | 19.000-AS-B7 | 19.000 | 10.7 | 6 | B7 | S | A | ● | |
| | 20.000-AS-B7 | 20.000 | 10.7 | 6 | B7 | S | A | ● | |
| | 20.001-AS-B8 | 20.001 | 12.9 | 8 | B8 | S | A | ● | |
| | 21.000-AS-B8 | 21.000 | 12.9 | 8 | B8 | S | A | ● | |
| | 22.000-AS-B8 | 22.000 | 12.9 | 8 | B8 | S | A | ● | |
| | 23.000-AS-B8 | 23.000 | 12.9 | 8 | B8 | S | A | ● | |
| | 24.000-AS-B8 | 24.000 | 12.9 | 8 | B8 | S | A | ● | |
| | 25.000-AS-B8 | 25.000 | 12.9 | 8 | B8 | S | A | ● | |
| | 26.000-AS-B9 | 26.000 | 12.9 | 8 | B9 | S | A | ● | |
| | 27.000-AS-B9 | 27.000 | 12.9 | 8 | B9 | S | A | ● | |
| | 28.000-AS-B9 | 28.000 | 12.9 | 8 | B9 | S | A | ● | |
| | 29.000-AS-B9 | 29.000 | 12.9 | 8 | B9 | S | A | ● | |
| | 30.000-AS-B9 | 30.000 | 12.9 | 8 | B9 | S | A | ● | |
| | 31.000-AS-B9 | 31.000 | 12.9 | 8 | B9 | S | A | ● | |
| | 32.000-AS-B9 | 32.000 | 12.9 | 8 | B9 | S | A | ● | |
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- NOF: Number of flutes
- SSC: Seat size code

●: Standard items

Recommended Cutting Conditions

Machining data for TS-REAM

| ISO | Material | Condition | Tensile strength (N/mm ²) | Hardness HB | Material No. | Cutting speed Vc (m/min) | | |
|-----------|--|------------------------|---------------------------------------|-------------------------|--------------|--------------------------|---------|---------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 420 | 125 | 1 | 120-250 | |
| | | ≥0.25%C | Annealed | 650 | 190 | 2 | 120-250 | |
| | | <0.55%C | Quenched and tempered | 850 | 250 | 3 | 120-250 | |
| | | ≥0.55%C | Annealed | 750 | 220 | 4 | | |
| | | | Quenched and tempered | 1000 | 300 | 5 | | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | | Annealed | | 600 | 200 | 6 | 120-250 |
| | | | | | 930 | 275 | 7 | 120-250 |
| | | | Quenched and tempered | | 1000 | 300 | 8 | 120-250 |
| | | | | | 1200 | 350 | 9 | 120-250 |
| | High alloy steel, cast steel and tool steel | | Annealed | 680 | 200 | 10 | 120-250 | |
| | | | Quenched and tempered | 1100 | 325 | 11 | 120-250 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | 680 | 200 | 12 | 60-120 | | |
| | | Martensitic | 820 | 240 | 13 | 60-120 | | |
| | | Austenitic | 600 | 180 | 14 | 60-120 | | |
| K | Gray cast iron (GG) | Ferritic | | 160 | 15 | 60-120 | | |
| | | Pearlitic | | 250 | 16 | 60-120 | | |
| | Cast iron nodular (GGG) | Ferritic | | 180 | 17 | 60-120 | | |
| | | Pearlitic | | 260 | 18 | 60-120 | | |
| | Malleable cast iron | Ferritic | | 130 | 19 | 60-120 | | |
| Pearlitic | | | 230 | 20 | 60-120 | | | |
| N | Aluminum - Wrought alloy | Not cureable | | 60 | 21 | 250-500 | | |
| | | Cured | | 100 | 22 | 250-500 | | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | | 75 | 23 | 250-500 | |
| | | | Cured | | 90 | 24 | 250-500 | |
| | | >12% Si | High temp. | | 130 | 25 | | |
| | Copper alloys | | >1% Pb | Free cutting | | 110 | 26 | |
| | | | | Brass | | 90 | 27 | |
| | Non-metallic | | | Electrolitic copper | | 100 | 28 | |
| | | | Duroplastics, fiber plastics | | | 29 | | |
| | | Hard rubber | | | | 30 | | |
| S | High temp. alloys | Fe based | Annealed | | 200 | 31 | | |
| | | | Cured | | 280 | 32 | | |
| | | Ni or Co based | Annealed | | 250 | 33 | 25-50 | |
| | | | Cured | | 350 | 34 | 25-50 | |
| | | | Cast | | 320 | 35 | | |
| | Titanium, Ti alloys | | | Rm 400 | | 36 | 30-80 | |
| | | | | Alpha+beta alloys cured | Rm 1050 | | 37 | 30-80 |
| H | Hardened steel | | Hardened | | 55HRC | 38 | 25-60 | |
| | | | Hardened | | 60HRC | 39 | | |
| | Chilled cast iron | Cast | | 400 | 40 | | | |
| | Cast iron nodular | Hardened | | | 55HRC | 41 | | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions



Machining data for TM-REAM - Through hole

| ISO | Material | Condition | Material No. | Through hole | | Interrupted through Hole | | |
|-----|--|------------------------|-----------------------|--------------|------------------|--------------------------|------------------|------------------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 1 | TT9030 | BL | TT9030 | BL |
| | | >=0.25%C | Annealed | 2 | Vc = 80 - 200 | | Vc = 60 - 120 | |
| | | <0.55%C | Quenched and tempered | 3 | B4 - B6 | fz = 0.08 - 0.21 | B4 - B6 | fz = 0.08 - 0.21 |
| | | >=0.55%C | Annealed | 4 | | | | |
| | | Quenched and tempered | 5 | B7 - B9 | fz = 0.12 - 0.27 | B7 - B9 | fz = 0.09 - 0.21 | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | Annealed | | 6 | TT9030 | BL | TT9030 | BL |
| | | Quenched and tempered | | 7 | Vc = 80 - 200 | | Vc = 60 - 120 | |
| | | | | 8 | B4 - B6 | fz = 0.08 - 0.21 | B4 - B6 | fz = 0.08 - 0.21 |
| | | | | 9 | B7 - B9 | fz = 0.12 - 0.27 | B7 - B9 | fz = 0.09 - 0.21 |
| | High alloy steel, cast steel and tool steel | Annealed | | 10 | TT9030 | BL | TT9030 | BL |
| | | Quenched and tempered | | | Vc = 20 - 60 | | Vc = 20 - 60 | |
| 11 | | | | B4 - B6 | fz = 0.05 - 0.13 | B4 - B6 | fz = 0.04 - 0.11 | |
| | | | | B7 - B9 | fz = 0.07 - 0.17 | B7 - B9 | fz = 0.05 - 0.14 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | | 12 | TT9030 | BL | TT9030 | BL |
| | | | | | Vc = 20 - 40 | | Vc = 20 - 40 | |
| | | Martensitic | | 13 | B4 - B6 | fz = 0.05 - 0.13 | B4 - B6 | fz = 0.04 - 0.11 |
| | Austenitic | | 14 | B7 - B9 | fz = 0.07 - 0.17 | B7 - B9 | fz = 0.05 - 0.14 | |
| K | Gray cast iron (GG) | Ferritic | | 15 | Vc = 120 - 220 | | Vc = 80 - 200 | |
| | | Pearlitic | | 16 | B4 - B6 | fz = 0.08 - 0.18 | B4 - B6 | fz = 0.05 - 0.13 |
| | | | | | B7 - B9 | fz = 0.10 - 0.24 | B7 - B9 | fz = 0.07 - 0.17 |
| | Cast iron nodular (GGG) | Ferritic | | 17 | TT9030 | AS or BL | TT9030 | BL |
| | | | | | Vc = 160 - 280 | | Vc = 150 - 250 | |
| | | Pearlitic | | 18 | B4 - B6 | fz = 0.11 - 0.20 | B4 - B6 | fz = 0.06 - 0.15 |
| | | | | | B7 - B9 | fz = 0.11 - 0.24 | B7 - B9 | fz = 0.08 - 0.19 |
| | Malleable cast iron | Ferritic | | 19 | TT9030 | AS or BL | TT9030 | BL |
| | | | Vc = 100 - 220 | | Vc = 100 - 220 | | | |
| | Pearlitic | | 20 | B4 - B6 | fz = 0.11 - 0.20 | B4 - B6 | fz = 0.06 - 0.15 | |
| | | | | B7 - B9 | fz = 0.11 - 0.24 | B7 - B9 | fz = 0.08 - 0.20 | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions

Machining data for TM-REAM - Through hole

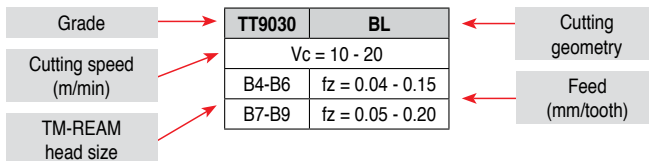
| ISO | Material | Condition | Material No. | Through hole | | Interrupted through Hole | | |
|---------------------|--------------------------|-------------------------|------------------------------|------------------|------------------|--------------------------|------------------|------------------|
| N | Aluminum - Wrought alloy | Not cureable | 21 | B7 - B9 | BL or GS | TTAL10 | BL | |
| | | Cured | 22 | Vc = 150 - 400 | | Vc = 150 - 400 | | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | 23 | B4 - B6 | fz = 0.08 - 0.16 | B4 - B6 | fz = 0.08 - 0.16 |
| | | Cured | 24 | | | | | |
| | >12% Si | High temp. | 25 | B7 - B9 | fz = 0.10 - 0.20 | B7 - B9 | fz = 0.10 - 0.20 | |
| | | Copper alloys | >1% Pb | Free cutting | 26 | TT9030 | BL | TT9030 |
| | Vc = 50 - 200 | | | | | Vc = 50 - 200 | | |
| | Brass | | 27 | B4 - B6 | fz = 0.08 - 0.18 | B4 - B6 | fz = 0.05 - 0.13 | |
| | Non-metallic | | Electrolytic copper | 28 | B7 - B9 | fz = 0.10 - 0.23 | B7 - B9 | fz = 0.07 - 0.16 |
| | | | Duroplastics, fiber plastics | 29 | TT9030 | AS | TT9030 | AS |
| Vc = 25 - 80 | | | | | Vc = 25 - 80 | | | |
| Hard rubber | | | 30 | B4 - B6 | fz = 0.05 - 0.10 | B4 - B6 | fz = 0.05 - 0.10 | |
| | B7 - B9 | fz = 0.10 - 0.20 | | B7 - B9 | fz = 0.10 - 0.20 | | | |
| S | High temp. alloys | Fe based | Annealed | 31 | TT9030 | L * | TT9030 | L * |
| | | | Cured | 32 | Vc = 15 - 50 | | Vc = 15 - 50 | |
| | | Ni or Co based | Annealed | 33 | B4 - B6 | fz = 0.04 - 0.10 | B4 - B6 | fz = 0.03 - 0.08 |
| | | | Cured | 34 | | | | |
| | Cast | 35 | B7 - B9 | fz = 0.05 - 0.13 | B4 - B6 | fz = 0.04 - 0.11 | | |
| | | 36 | | | | | | |
| Titanium, Ti alloys | 37 | Alpha+beta alloys cured | | | | | | |
| H | Hardened steel | Hardened | 38 | TT9030 | BL | TT9030 | BL | |
| | | Hardened | 39 | Vc = 25 - 50 | | Vc = 25 - 50 | | |
| | Chilled cast iron | Cast | 40 | B4 - B6 | fz = 0.06 - 0.15 | B4 - B6 | fz = 0.06 - 0.15 | |
| Cast iron nodular | Hardened | 41 | B7 - B9 | fz = 0.10 - 0.20 | B7 - B9 | fz = 0.10 - 0.20 | | |

* Standard edge geometries are not suitable for reaming titanium and high temperature alloys.

In order to choose a proper geometry, please ask for our recommendations.

- The given cutting data recommendations refer to the short holders (3xD effective reaming overhang). For longer holders, the cutting speed to be reduced proportionally.
- For relatively large leading angles (spot-facing geometries), the feed to be reduced up to 30%.
- All the given cutting data recommendations refer to the machines with spindle through coolant supply.

Legend:



Recommended Cutting Conditions



Machining data for TM-REAM - Blind hole

| ISO | Material | Condition | Material No. | Blind hole | | Interrupted blind hole | | |
|---------------------|--|------------------------|-----------------------|----------------|------------------|------------------------|------------------|------------------|
| P | Non-alloy steel, cast steel, free cutting steel | <0.25%C | Annealed | 1 | TT9030 | AS | TT9030 | AS |
| | | >=0.25%C | Annealed | 2 | Vc = 60-160 | | Vc = 60 - 120 | |
| | | <0.55%C | Quenched and tempered | 3 | B4 - B6 | fz = 0.06 - 0.18 | B4 - B6 | fz = 0.05 - 0.15 |
| | | >=0.55%C | Annealed | 4 | | | | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | Quenched and tempered | | 5 | B7 - B9 | fz = 0.08 - 0.20 | B7 - B9 | fz = 0.07 - 0.16 |
| | | Annealed | | 6 | TT9030 | AS | TT9030 | AS |
| | | Quenched and tempered | | 7 | Vc = 60-160 | | Vc = 60 - 120 | |
| | High alloy steel, cast steel and tool steel | Quenched and tempered | | 8 | B4 - B6 | fz = 0.06 - 0.18 | B4 - B6 | fz = 0.05 - 0.15 |
| | | Quenched and tempered | | 9 | B7 - B9 | fz = 0.08 - 0.20 | B7 - B9 | fz = 0.07 - 0.16 |
| | | Annealed | | 10 | TT9030 | AS | TT9030 | AS |
| | | Quenched and tempered | | 11 | Vc = 20 - 60 | | Vc = 20 - 60 | |
| M | Stainless steel and cast steel | Ferritic / martensitic | | 12 | TT9030 | AS | TT9030 | AS |
| | | Martensitic | | 13 | Vc = 20 - 40 | | Vc = 20 - 40 | |
| | | Austenitic | | 14 | B4 - B6 | fz = 0.04 - 0.10 | B4 - B6 | fz = 0.03 - 0.08 |
| K | Gray cast iron (GG) | Ferritic | | 15 | B7 - B9 | fz = 0.05 - 0.13 | B7 - B9 | fz = 0.05 - 0.10 |
| | | Pearlitic | | 16 | TT9030 | AS | TT9030 | AS |
| | Cast iron nodular (GGG) | Ferritic | | 17 | Vc = 80 - 200 | | Vc = 60 - 120 | |
| | | Pearlitic | | 18 | B4 - B6 | fz = 0.06 - 0.18 | B4 - B6 | fz = 0.05 - 0.13 |
| | Malleable cast iron | Ferritic | | 19 | B7 - B9 | fz = 0.08 - 0.23 | B7 - B9 | fz = 0.08 - 0.18 |
| | | Pearlitic | | 20 | TT9030 | AS | TT9030 | AS |
| | | Ferritic | | 19 | Vc = 160 - 280 | | Vc = 160 - 240 | |
| | | Pearlitic | | 18 | B4 - B6 | fz = 0.06 - 0.18 | B4 - B6 | fz = 0.06 - 0.16 |
| Malleable cast iron | Pearlitic | | 20 | B7 - B9 | fz = 0.08 - 0.23 | B7 - B9 | fz = 0.08 - 0.18 | |
| | Ferritic | | 19 | TT9030 | AS | TT9030 | AS | |
| Malleable cast iron | Pearlitic | | 20 | Vc = 100 - 220 | | Vc = 100 - 220 | | |
| | Ferritic | | 19 | B4 - B6 | fz = 0.06 - 0.18 | B4 - B6 | fz = 0.05 - 0.15 | |
| Malleable cast iron | Pearlitic | | 20 | B7 - B9 | fz = 0.08 - 0.23 | B7 - B9 | fz = 0.08 - 0.20 | |

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous
 ■ High temp. alloys
 ■ Hardened steel

Recommended Cutting Conditions

Machining data for TM-REAM - Blind hole

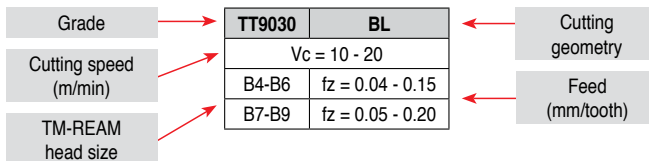
| ISO | Material | Condition | Material No. | Blind hole | | Interrupted blind hole | | |
|-------------------|--------------------------|------------------------------|---------------------|------------------|------------------|------------------------|------------------|------------------|
| N | Aluminum - Wrought alloy | Not cureable | 21 | TTAL10 | GS or AS | TTAL10 | GS or AS | |
| | | Cured | 22 | Vc = 150 - 400 | | Vc = 150 - 300 | | |
| | Aluminum-cast, alloyed | <=12% Si | Not cureable | 23 | B4 - B6 | fz = 0.08 - 0.16 | B4 - B6 | fz = 0.07 - 0.15 |
| | | | Cured | 24 | | | | |
| | | >12% Si | High temp. | 25 | B7 - B9 | fz = 0.11 - 0.20 | B7 - B9 | fz = 0.11 - 0.20 |
| | Copper alloys | >1% Pb | Free cutting | 26 | TT9030 | AS | TT9030 | AS |
| | | | | | Vc = 50 - 200 | | Vc = 50 - 200 | |
| | | Brass | 27 | B4 - B6 | fz = 0.08 - 0.16 | B4 - B6 | fz = 0.08 - 0.16 | |
| | | | Electrolitic copper | 28 | B7 - B9 | fz = 0.10 - 0.20 | B7 - B9 | fz = 0.10 - 0.20 |
| | Non-metallic | Duroplastics, fiber plastics | | 29 | TT9030 | AS | TT9030 | AS |
| | | Vc = 25 - 80 | | Vc = 25 - 80 | | | | |
| Hard rubber | | 30 | B4 - B6 | fz = 0.05 - 0.10 | B4 - B6 | fz = 0.05 - 0.10 | | |
| S | High temp. alloys | Fe based | Annealed | 31 | TT9030 | L * | TT9030 | L * |
| | | | Cured | 32 | Vc = 15 - 50 | | Vc = 15 - 50 | |
| | | Ni or Co based | Annealed | 33 | | | | |
| | | | Cured | 34 | B4 - B6 | fz = 0.03 - 0.08 | B4 - B6 | fz = 0.03 - 0.08 |
| | | | Cast | 35 | | | | |
| | Titanium, Ti alloys | | | | 36 | B7 - B9 | fz = 0.04 - 0.11 | B7 - B9 |
| | | Alpha+beta alloys cured | | 37 | | | | |
| H | Hardened steel | Hardened | 38 | TT9030 | AS | TT9030 | AS | |
| | | Hardened | 39 | Vc = 25 - 50 | | Vc = 25 - 50 | | |
| | Chilled cast iron | Cast | 40 | B4 - B6 | fz = 0.05 - 0.13 | B4 - B6 | fz = 0.05 - 0.13 | |
| Cast iron nodular | Hardened | 41 | B7 - B9 | fz = 0.10 - 0.20 | B7 - B9 | fz = 0.10 - 0.20 | | |

* Standard edge geometries are not suitable for reaming titanium and high temperature alloys.

In order to choose a proper geometry, please ask for our recommendations.

- The given cutting data recommendations refer to the short holders (3xD effective reaming overhang). For longer holders, the cutting speed to be reduced proportionally.
- For relatively large leading angles (spot-facing geometries), the feed to be reduced up to 30%.
- All the given cutting data recommendations refer to the machines with spindle through coolant supply.

Legend:



Recommended Cutting Conditions



Machining data for TB-REAM

| | | | Lead A (15°/3°) (Reaming allowance: 0.1~0.3) | | | | | | |
|-----|--|--------------|---|----------|-----------------------------|----------------|---------|------------|------------|
| | | | Feed (mm/rev) | Rake (°) | Cutting speed Vc (m/min) | | | | |
| ISO | Material | Material No. | | | Carbide | Coated carbide | Cermet | PCD | CBN |
| P | Non-alloy steel and cast steel, free cutting steel | 1 - 5 | 0.1-0.4 | 6 | 40-60 | 60-80 | 110-160 | | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | 6 - 9 | 0.1-0.4 | 6 | 20-40 | 40-60 | 110-160 | | |
| | High alloyed steel, cast steel and tool steel | 10 - 11 | 0.1-0.4 | 6 | 20-40 | 20-60 | 20-60 | | |
| M | Stainless steel, cast steel | 12 - 14 | 0.1-0.3 | 12 | 20-40 | 40-60 | 20-60 | | |
| K | Grey cast iron (GG) | 15 - 16 | 0.1-0.3 | 0 / 6 | 40-60 | 60-100 | | | Please ask |
| | Cast iron nodular (GGG) | 17 - 18 | 0.1-0.3 | 0 / 6 | 40-60 | 60-100 | | | |
| | Malleable cast iron | 19 - 20 | 0.1-0.3 | 0 / 6 | 40-60 | 60-100 | | | |
| N | Aluminum wrought alloy | 21 - 22 | | | | | | Please ask | |
| | Aluminum-cast, alloyed | 23 - 25 | | | | | | | |
| | Copper alloys | 26 - 28 | | | | | | | |
| | Non-metallic | 29 - 30 | | | | | | | |

| | | | Lead C (75°) (Reaming allowance: 0.2~0.4) | | | | | | |
|-----|--|--------------|--|----------|-----------------------------|----------------|--------|------------|------------|
| | | | Feed (mm/rev) | Rake (°) | Cutting speed Vc (m/min) | | | | |
| ISO | Material | Material No. | | | Carbide | Coated carbide | Cermet | PCD | CBN |
| P | Non-alloy steel and cast steel, free cutting steel | 1 - 5 | | | | | | | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | 6 - 9 | | | | | | | |
| | High alloyed steel, cast steel and tool steel | 10 - 11 | | | | | | | |
| M | Stainless steel, cast steel | 12 - 14 | | | | | | | |
| K | Grey cast iron (GG) | 15 - 16 | | | | | | | Please ask |
| | Cast iron nodular (GGG) | 17 - 18 | | | | | | | |
| | Malleable cast iron | 19 - 20 | | | | | | | |
| N | Aluminum wrought alloy | 21 - 22 | 0.15-0.3 | 12 | 150-250 | | | Please ask | |
| | Aluminum-cast, alloyed | 23 - 25 | 0.15-0.3 | 12 | 150-250 | | | | |
| | Copper alloys | 26 - 28 | | | | | | | |
| | Non-metallic | 29 - 30 | | | | | | | |

• The cutting conditions in the table below should be used to start a new application. Optimal conditions for a specific application should be evaluated by examining the results and changing the machining conditions accordingly.

• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous

Recommended Cutting Conditions

Machining data for TB-REAM

| | | | Lead B (30°/3°) (Reaming allowance: 0.1 ~ 0.3) | | | | | | |
|-----|--|--------------|---|----------|-----------------------------|----------------|---------|------------|------------|
| | | | Feed (mm/rev) | Rake (°) | Cutting speed Vc (m/min) | | | | |
| ISO | Material | Material No. | | | Carbide | Coated carbide | Cermet | PCD | CBN |
| P | Non-alloy steel and cast steel, free cutting steel | 1 - 5 | 0.1-0.4 | 6 | 60-80 | 80-120 | 110-160 | | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | 6 - 9 | 0.1-0.4 | 6 | 60-80 | 80-120 | 110-160 | | |
| | High alloyed steel, cast steel and tool steel | 10 - 11 | 0.1-0.4 | 6 | 40-60 | 40-80 | 40-80 | | |
| M | Stainless steel, cast steel | 12 - 14 | 0.1-0.3 | 12 | 40-60 | 60-80 | 60-80 | | |
| K | Grey cast iron (GG) | 15 - 16 | 0.1-0.3 | 0 / 6 | 60-80 | 80-120 | | | Please ask |
| | Cast iron nodular (GGG) | 17 - 18 | 0.1-0.3 | 0 / 6 | 60-80 | 80-120 | | | |
| | Malleable cast iron | 19 - 20 | 0.1-0.3 | 0 / 6 | 60-80 | 80-120 | | | |
| N | Aluminum wrought alloy | 21 - 22 | | 12 | 160-200 | | | Please ask | |
| | Aluminum-cast, alloyed | 23 - 25 | | 12 | 160-200 | | | | |
| | Copper alloys | 26 - 28 | | 0 | 80-100 | | | | |
| | Non-metallic | 29 - 30 | | 0 | 10-70 | | | | |

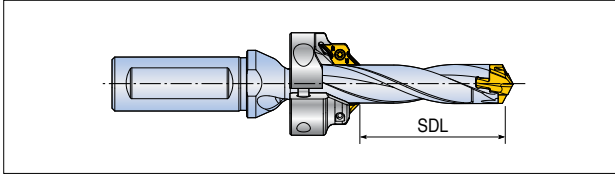
| | | | Lead D (30°/3°) (Reaming allowance: 0.1 ~ 0.2) | | | | | | |
|-----|--|--------------|---|----------|-----------------------------|----------------|---------|------------|------------|
| | | | Feed (mm/rev) | Rake (°) | Cutting speed Vc (m/min) | | | | |
| ISO | Material | Material No. | | | Carbide | Coated carbide | Cermet | PCD | CBN |
| P | Non-alloy steel and cast steel, free cutting steel | 1 - 5 | 0.1-0.4 | 6 | 60-80 | 80-120 | 110-160 | | |
| | Low alloy steel and cast steel (Less than 5% of alloying elements) | 6 - 9 | 0.1-0.4 | 6 | 60-80 | 80-120 | 110-160 | | |
| | High alloyed steel, cast steel and tool steel | 10 - 11 | 0.1-0.4 | 6 | 40-60 | 40-80 | 40-80 | | |
| M | Stainless steel, cast steel | 12 - 14 | 0.1-0.3 | 12 | 40-60 | 60-80 | 60-80 | | |
| K | Grey cast iron (GG) | 15 - 16 | 0.1-0.3 | 0 / 6 | 60-80 | 80-120 | | | Please ask |
| | Cast iron nodular (GGG) | 17 - 18 | 0.1-0.3 | 0 / 6 | 60-80 | 80-120 | | | |
| | Malleable cast iron | 19 - 20 | 0.1-0.3 | 0 / 6 | 60-80 | 80-120 | | | |
| N | Aluminum wrought alloy | 21 - 22 | | 12 | 110-200 | | | Please ask | |
| | Aluminum-cast, alloyed | 23 - 25 | | 12 | 160-200 | | | | |
| | Copper alloys | 26 - 28 | | 0 | 80-100 | | | | |
| | Non-metallic | 29 - 30 | | | | | | | |

• The cutting conditions in the table below should be used to start a new application. Optimal conditions for a specific application should be evaluated by examining the results and changing the machining conditions accordingly.

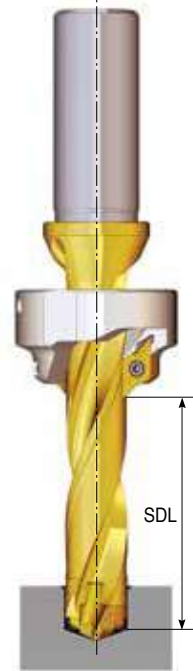
• For more information of material groups, see the materials & grades "material conversion table"

■ Steel
 ■ Stainless steel
 ■ Cast iron
 ■ Nonferrous

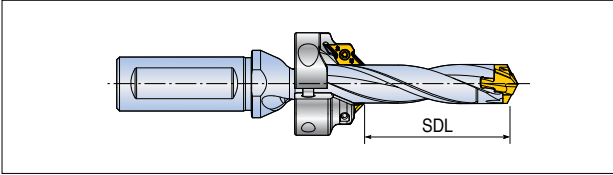
► Chamfering ring designation - DRILL-RUSH



| | Designation | CFR designation | SDL | |
|--------------------|------------------------|-----------------|-----|-----|
| | | | min | max |
| 3D | TCD 130-134-16T3/S0-3D | CFR D130-A45 | 19 | 19 |
| | 135-139-16T3/S0-3D | CFR D135-A45 | 19 | 20 |
| | 140-144-16T3/S0-3D | CFR D140-A45 | 21 | 22 |
| | 145-149-16T3/S0-3D | CFR D145-A45 | 22 | 23 |
| | 150-159-20T3/S0-3D | CFR D150-A45 | 23 | 23 |
| | 160-169-20T3/S0-3D | CFR D160-A45 | 24 | 25 |
| | 170-179-20T3/S0-3D | CFR D170-A45 | 26 | 28 |
| | 180-189-25T2/S0-3D | CFR D180-A45 | 27 | 30 |
| | 190-199-25T2/S0-3D | CFR D190-A45 | 29 | 33 |
| | 200-209-25T2/S0-3D | CFR D200-A45 | 30 | 36 |
| | 210-219-25T2/S0-3D | CFR D210-A45 | 32 | 39 |
| | 220-229-25T2/S0-3D | CFR D220-A45 | 33 | 42 |
| | 230-239-32T2/S0-3D | CFR D230-A45 | 35 | 45 |
| 240-249-32T2/S0-3D | CFR D240-A45 | 36 | 48 | |
| 250-259-32T2/S0-3D | CFR D250-A45 | 38 | 51 | |
| 5D | TCD 100-104-16T3/S0-5D | CFR D100-A45 | 28 | 28 |
| | 105-109-16T3/S0-5D | CFR D105-A45 | 29 | 30 |
| | 110-114-16T3/S0-5D | CFR D110-A45 | 31 | 33 |
| | 115-119-16T3/S0-5D | CFR D115-A45 | 32 | 35 |
| | 120-124-16T3/S0-5D | CFR D120-A45 | 33 | 45 |
| | 125-129-16T3/S0-5D | CFR D125-A45 | 34 | 40 |
| | 130-134-16T3/S0-5D | CFR D130-A45 | 36 | 43 |
| | 135-139-16T3/S0-5D | CFR D135-A45 | 37 | 43 |
| | 140-144-16T3/S0-5D | CFR D140-A45 | 38 | 48 |
| | 145-149-16T3/S0-5D | CFR D145-A45 | 39 | 48 |
| | 150-159-20T3/S0-5D | CFR D150-A45 | 41 | 53 |
| | 160-169-20T3/S0-5D | CFR D160-A45 | 43 | 58 |
| | 170-179-20T3/S0-5D | CFR D170-A45 | 46 | 63 |
| | 180-189-25T2/S0-5D | CFR D180-A45 | 48 | 68 |
| | 190-199-25T2/S0-5D | CFR D190-A45 | 51 | 73 |
| | 200-209-25T2/S0-5D | CFR D200-A45 | 53 | 78 |
| | 210-219-25T2/S0-5D | CFR D210-A45 | 56 | 79 |
| 220-229-25T2/S0-5D | CFR D220-A45 | 58 | 84 | |
| 230-239-32T2/S0-5D | CFR D230-A45 | 61 | 89 | |
| 240-249-32T2/S0-5D | CFR D240-A45 | 63 | 94 | |
| 250-259-32T2/S0-5D | CFR D250-A45 | 66 | 99 | |



► Chamfering ring designation - DRILL-RUSH



| | Designation | CFR designation | SDL | |
|--------------------|------------------------|-----------------|-----|-----|
| | | | min | max |
| 8D | TCD 100-104-16T3/S0-8D | CFR D100-A45 | 45 | 58 |
| | 105-109-16T3/S0-8D | CFR D105-A45 | 49 | 62 |
| | 110-114-16T3/S0-8D | CFR D110-A45 | 49 | 66 |
| | 115-119-16T3/S0-8D | CFR D115-A45 | 53 | 70 |
| | 120-124-16T3/S0-8D | CFR D120-A45 | 53 | 74 |
| | 125-129-16T3/S0-8D | CFR D125-A45 | 57 | 78 |
| | 130-134-16T3/S0-8D | CFR D130-A45 | 57 | 82 |
| | 135-139-16T3/S0-8D | CFR D135-A45 | 61 | 84 |
| | 140-144-16T3/S0-8D | CFR D140-A45 | 61 | 88 |
| | 145-149-16T3/S0-8D | CFR D145-A45 | 65 | 92 |
| | 150-159-20T3/S0-8D | CFR D150-A45 | 65 | 96 |
| | 160-169-20T3/S0-8D | CFR D160-A45 | 69 | 103 |
| | 170-179-20T3/S0-8D | CFR D170-A45 | 73 | 111 |
| | 180-189-25T2/S0-8D | CFR D180-A45 | 77 | 118 |
| | 190-199-25T2/S0-8D | CFR D190-A45 | 81 | 126 |
| | 200-209-25T2/S0-8D | CFR D200-A45 | 85 | 134 |
| | 210-219-25T2/S0-8D | CFR D210-A45 | 89 | 142 |
| | 220-229-25T2/S0-8D | CFR D220-A45 | 93 | 150 |
| 230-239-32T2/S0-8D | CFR D230-A45 | 97 | 158 | |
| 240-249-32T2/S0-8D | CFR D240-A45 | 101 | 166 | |
| 250-259-32T2/S0-8D | CFR D250-A45 | 105 | 174 | |
| 12D | TCD 120-124-16S0-12D | CFR D120-A45 | 87 | 121 |
| | 125-129-16S0-12D | CFR D125-A45 | 90 | 127 |
| | 130-134-16S0-12D | CFR D130-A45 | 93 | 133 |
| | 135-139-16S0-12D | CFR D135-A45 | 96 | 137 |
| | 140-144-16S0-12D | CFR D140-A45 | 99 | 143 |
| | 145-149-16S0-12D | CFR D145-A45 | 102 | 149 |
| | 150-159-20S0-12D | CFR D150-A45 | 105 | 155 |
| | 160-169-20S0-12D | CFR D160-A45 | 111 | 166 |
| | 170-179-20S0-12D | CFR D170-A45 | 117 | 178 |
| | 180-189-25S0-12D | CFR D180-A45 | 123 | 189 |
| | 190-199-25S0-12D | CFR D190-A45 | 129 | 201 |
| | 200-209-25S0-12D | CFR D200-A45 | 135 | 213 |
| 210-219-25S0-12D | CFR D210-A45 | 141 | 225 | |
| 220-229-25S0-12D | CFR D220-A45 | 147 | 237 | |

